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To what extend economic uncertainty effects tourism investments? Evidence from OECD and non-OECD economies

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ABSTRACT

This paper aims to examine the role of economic policy uncertainty (EPU) on tourism investments across the samples of OECD, non-OECD, high-income, upper-middle-income, and low-income economies. We account for cross-sectional dependence and endogeneity and also incorporate economic development, financial development, and trade openness indicators in the analyses. By using annual data between 1996 and 2016 and a total of 101 countries, we provide robust estimates on the determinants of tourism investments. The findings from the Common Correlated Effects Mean Group (CCEMG) and the Group Mean approaches show that the EPU has a significant negative impact on tourism investments across the panels. Moreover, other estimates suggest that economic development, financial development, and trade positively contribute to tourism investments.

1. Introduction

The tourism industry has a vital role in creating employment opportunities, generating tax revenues, rising foreign exchange reserves, and leading to socio-economic development (Alam & Paramati, 2017). Travel and Tourism sectors contribute to 10.4% of global gross domestic product (GDP) in 2018 and create 319 million jobs (10% of all jobs in 2018). The industry's share in total national investments is 4.4%, with a value of USD 941 Billion, and this ratio is expected to reach 5.0% by 2029 (the World Travel & Tourism Council (WTTC), 2019).

In this paper, we aim to analyse the determinants of tourism investments, and a particular focus is given to economic policy uncertainty (EPU).[1] A country can economically benefit from tourism, but this depends on the availability of capital investment in the development of transportation and accommodation services (Proença & Soukiazis, 2008; Sokhanvar, 2019). Therefore, tourism investments are crucial to increase the benefits of tourism growth in the economy. For instance, Alam and Paramati (2017) document that a 1% increase in tourism investments raises tourism development (measured by tourist arrivals) by 0.98%. Similarly, Paramati, Alam, and Lau (2018) reveal that a 1% rise in tourism investment increases tourism revenue by 0.197% in a sample of 28 European Union member countries. In line with these evidences, we can suggest that countries need to create specific policy implications by fostering tourism investments to increase the possible economic benefits of tourism.

On the contrary, a delay/cancellation in tourism investments will lead to a decrease in the level of tourism development. Therefore, governments should create a stable economic environment and consistent policies. In an uncertain economic and political environment, firms can delay their investments to a more stable period. This issue, so-called the "wait-and-see" behaviour of firms during the times of higher uncertainty, can lead to a decline in the level of tourism investments; thus, higher uncertainty can restrain the economic benefits of the tourism sector (Akron, Demir, Díez-Esteban, & García-Gómez, 2020)

Rising uncertainty can affect tourism investment in several ways. A first one is the "real-options channel" (Bernanke, 1983). If the investment projects are irreversible, rising uncertainty makes managers to delay investment decisions to a more certain period by adopting a "wait-and-see" attitude (Bloom, Bond, & Van Reenen, 2007; Prüser & Schlösser, 2020). A second one is the "supply-side channel", that is,

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[1] The EPU is proxied with World Uncertainty Index (WUI).

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uncertainty can lead to an increased cost of finance, risk premium, and risk of default (Bloom, 2009; Rodrik, 1991). These issues may motivate the precautionary measures for companies and delay/cancel their investment decisions (Handley & Limão, 2015; Liu & Zhang, 2020). The third one is the "consumer demand-side" channel. Rising uncertainty can lead to a significant decline in tourism demand. For instance, Gozgor and Ongan (2017) and Demir and Gozgor (2018) show that there is a negative impact of the index of EPU on tourism demand. In this case, companies can delay their investment decisions due to the decreasing tourism demand.

Previous papers have examined the impact of uncertainty on investment by using the firm-level and the macro-level data. For example, Chen, Lee, and Zeng (2019) and Kang, Lee, and Ratti (2014) study the firms in the United States (U.S.), while Wang, Chen, and Huang (2014) examine the case of the Chinese firms. All of these papers document that there is a negative impact of EPU (the news-based uncertainty measurement) on corporate investments. According to Baker, Bloom, and Davis (2016), corporate investments are significantly affected by an increase in the level of the EPU.

Different from the previous papers, this paper uses novel datasets for the country-level analysis rather than the firm-level data. We use an EPU indicator depending on the count of related words, and it is also comparable across countries. For this purpose, we explore the effect of the EPU on tourism investments across the samples of the OECD, non-OECD, high-income, upper-middle-income, and low-income economies. To our knowledge, this is the first study in the literature for exploring the impact of the EPU, measured by the newly developed uncertainty index so-called the "World Uncertainty Index" on tourism investments. In doing so, we focus on the supply-side of tourism, and this makes our research novel since previous papers have generally focused on the demand side of tourism. By using yearly data from 1996 to 2016 on 101 countries and robust panel econometric techniques, we find that the EPU has a significant negative impact on tourism investments across the panel groups. Among the control variables, we find that economic development, financial development, and trade positively contribute to tourism investments. Given these evidences, we argue that the policymakers and practitioners have to be aware of the fact that the EPU adversely affects tourism investments directly and tourism development indirectly. Hence, the EPU will have severe ramifications on the tourism sector in specific and economic development in general. To counter this issue, the policy authorities need to take necessary policy actions to sustain tourism investments, particularly in times of high economic policy uncertainty.

The rest of the paper is organized as follows. Section 2 reviews the previous literature on the impact of uncertainty shocks on tourism indicators. Section 3 presents the data and methodology. Section 4 displays detailed estimated results, discussion and offers related policy and practical implications. Finally, Section 5 reports the conclusion of the paper.

2. Literature review on determinants of tourism

2.1. Economic policy uncertainty and tourism

Since the introduction of the EPU by Baker et al. (2016), there has been a rising interest in the literature. It was widely considered and used as a proxy for uncertainty. Likewise, several studies have analysed the effect of EPU on tourism. While a strand of the literature examines the impact of uncertainty on tourism demand, some of the studies focus on its impact on the performance of listed tourism companies.

To the best of our knowledge, Dragouni, Filis, Gavriilidis, and Santamaria (2016) is the first study in terms of introducing the index of economic policy uncertainty to tourism demand. The authors consider the EPU as an alternative measure of sentiment and source of spillover effects to tourism. Using the data from January 1996 until December 2013, it is found that there are significant spillover effects from EPU to outbound tourism during the periods of high uncertainty, while there are no spillover effects of the EPU when the level of EPU is low. These findings imply that households cancel or postpone their demand for holidays abroad when uncertainty is high. Following Dragouni et al. (2016), Gozgor and Ongan (2017) explore the effect of the index of EPU on domestic tourism demand in the United States for the period of 1998Q1 and 2015Q4. By using the time-series analysis, it is shown that EPU harms domestic tourism spending in the long run. Therefore, the EPU decreases not only the outbound tourism demand as documented by Dragouni et al. (2016) but also the domestic tourism demand. Besides, Gozgor and Ongan (2017) suggest the usage of EPU in tourism demand models as a proxy for uncertainty in addition to the traditional control variables.

In the first multi-country study, Demir and Gozgor (2018) show that EPU has a negative effect on outbound tourism in 15 countries and the evidence is based on the estimations of the Bias-corrected Least Square Dummy Variable (LSDVC) estimation technique. Specifically, one standard deviation increase in the EPU level will lead to a 2.47% decrease in outbound tourism, approximately movement of 700 K people. Ongan and Gozgor (2018) focus on the impact of the EPU on the number of Japanese tourists visiting the United States over the period 1996Q1–2015Q1. The United States has been a significant tourism destination for Japanese tourists, and Japan experienced higher uncertainty in the last decade. Based on this, it is found that the EPU index of Japan hurts the number of Japanese tourists visiting the United States both in the short- and long run. Chen, Hua, Chyou, and Tai (2020) examine how economic policy uncertainty affects the room demands in Taiwan. They document that the EPU harms the room demand of the Japanese and the Mainland Chinese tourist in the trough period of Taiwan's international hotels; however, the negative effect of the EPU disappears during the peak periods. Balli, Shahzad, and Uddin (2018) consider the impact of both domestic and global EPU on tourism inflows in the OECD countries. The wavelet analyses show that uncertainties negatively affect tourism inflows, and this impact is more substantial in the peak periods of uncertainty. This evidence implies that the policymakers should be considered domestic and global EPU on their tourism demand forecasts.

Likewise, Singh, Das, Jana, and Tiwari (2019) show that both the domestic EPU and global EPU have significant effects on tourist arrivals in the United States. Differently from the previous studies, Tsui, Balli, Tan, Lau, and Hasan (2018) analyse the impact of EPU on the business tourist flows for the case of New Zealand. It is found that the number of business visitors from the key trading partners to New Zealand will decrease when there is an increase in uncertainty in New Zealand. This evidence means that overseas business people change and defer their business travel plans; therefore, it is essential to create a stable economic environment to enhance business transactions. Tiwari, Das, and Dutta (2019) compare the effect of economic policy uncertainty and geopolitical risks on the tourist arrivals in India. The wavelet analysis shows that the impact of geopolitical risks is stronger than that of the EPU. Besides, the effect of geopolitical risks is more prolonged, and the economic policy uncertainty has a short-run impact of tourist arrivals.

On the other hand, Wu and Wu (2019) also investigate the relationship between the European economic policy uncertainty and tourism receipts for the case of Portugal, Ireland, Italy, Greece, and Spain. It is found that there is a unidirectional effect of the European EPU on international tourism receipts in the short run, but the effect is bidirectional in the long term. In a similar vein, Gozgor and Demir (2018) show that an increase in the EPU leads to a decrease in travel expenditures in 17 developed and developing countries. This negative effect is even higher in the developing economies compared to the developed countries. Demir and Ersan (2018) show that not only the EPU in Turkey but also EPU in Europe has adverse effects on the stock prices of listed tourism companies in Turkey over the period 2002–2013. This evidence implies that stock returns of the Turkish tourism companies are sensitive to both domestic and international EPU. Likewise,

Ersan, Akron, and Demir (2019) also find that stock prices of listed travel and leisure companies in Europe are negatively affected by both the European and the Global EPU for the period from 1997 to 2016. It is concluded that the EPU measures have superior forecasting power on tourism and leisure stock returns compared to traditional macroeconomic variables.

Madanoglu and Ozdemir (2019) is the first study in terms of examining the effect of EPU on the micro-level analysis. They show that hotel operating performance; namely, occupancy rate, revenue per available room, and average daily room rate is negatively related to the EPU. Further analysis indicates that hotels owned and managed by the same company are less affected by the EPU, compared to hotels where owners and managers are different. Moreover, the negative impact of the EPU is less severe for luxury hotels.

2.2. Economic development, tourism development, and investments

The benefit of tourism investments cannot be understood without examining the relationship between tourism development and economic development. A vast amount of effort is devoted to the understanding of the relationship between tourism development and economic growth and to determine the causality of the relationship. The findings in the literature are not yet conclusive as the results are shown to be sensitive to the data period, frequency, methodology, variables used, and country/countries included in the analysis (Brida, Cortes-Jimenez, & Pulina, 2016; Pablo-Romero & Molina, 2013; Shahzad, Shahbaz, Ferrer, & Kumar, 2017).

A significant part of the literature documents the supportive evidence for the tourism-led growth hypothesis implying that tourism development will foster economic development (Tang & Tan, 2015). On the contrary, other studies show that the significant causality runs from economic growth to tourism (Katircioglu, 2009). Moreover, there are also studies showing a bi-directional relationship between economic growth and tourism (Tugcu, 2014), which means that two variables reinforce each other. In a comprehensive study, which uses data for 113 countries for the period from 1995 to 2014, Antonakakis, Dragouni, Eeckels, and Filis (2019) argue that the growth-led-tourism hypothesis is valid for countries, which are developing, non-democratic, highly bureaucratic, and have a low tourism specialisation. The authors also show that economic, political, and tourism status of a destination moderates the economic growth and tourism relationship.

There are also studies focusing on the uncertainty and investment relation from a macroeconomic perspective, and these studies control the impact of economic development (measured by per capita income) in general. For instance, by using the monthly and quarterly industrial investment activity for four largest euro-area economies (Germany, France, Italy, and Spain), Meinen and Röhe (2017) show that uncertainty shocks (measured by the unpredictable components of a large set of macroeconomic indicators) decrease the investments. Prüser and Schlösser (2020) show that investment decisions are negatively affected by uncertainty. Besides, investments in fragile countries are hit more strongly, and the impact dies off later on average in the vulnerable countries compared to the stable countries. Gholipour (2019) examines the dynamic effects of EPU and political stability on the business fixed investments using the data from 19 major high-income and emerging economies from 1996 to 2016. It is shown that the index of EPU has a negative and short-run impact on investments, while political stability has a positive on the level of investment.

To conclude the literature review, to the best of our knowledge, the only study that has focused on the effect of uncertainty shocks on tourism investments is Panagiotidis and Printzis (2020), which examines the impact of uncertainty on tourism investments in Greece. The sector-level analysis shows that the negative effect of uncertainty is more influential in the real estate sector, manufacturing sector, and the hotels and restaurants sector than other industries. In line with this study, we aim to enhance the previous findings by examining the role of the EPU on tourism investments, particularly in the cross-country context. We use various models, controls, and estimation techniques as well as focus on the panel data of 101 countries for the period of 1996 to 2016. Therefore, we provide robust estimates of the determinants of tourism investments, which will be crucial in policy decision making.

3. Model, data, and methodology

3.1. Data and empirical model

As a dependent variable, we use the log of total tourism (capital) investments (USD in real prices).[2] The related data are retrieved from the WTTC statistical database (WTTC, 2019). Our dataset includes 101 countries for the period from 1996 to 2016, and the frequency of the data is annual. The selected sample countries are provided in Table 1. We also divide the sample countries into OECD, non-OECD, low-income, middle-income, and high-income economies based on World Bank classification. The high-income group countries have Gross National Income (GNI) per capita of higher than $12,375 in 2018. GNI per capita of low-income countries is $1025 or less in 2018, and middle-income countries have GNI per capita between $1026 and $12,374.

The primary variable of interest is the World Uncertainty Index (WUI),[3] which is developed by Ahir, Bloom, and Furceri (2018). The index is constructed by counting the frequencies of uncertainty and its variants in the country reports of Economist Intelligence Unit (EIU). As the raw counts are scaled by the total number of words in each report, the index can be used in a panel data format, and the values can be compared across countries (Ahir et al., 2018). While EPU is available for a limited number of countries, WUI is available for 143 countries. Moreover, it provides both domestic and global sources of uncertainty rather than local sources of uncertainty.

By making use of relevant empirical and theoretical arguments, we build the following empirical model:

$$TI_{it} = f\left(ED_{i,t}^{\beta_1}, FD_{i,t}^{\beta_2}, TO_{i,t}^{\beta_3}, WUI_{i,t}^{\beta_4}\right) + \mu_{i,t} \quad (1)$$

$$TI_{it} = \beta_0 + \beta_1 ED_{i,t} + \beta_2 FD_{i,t} + \beta_3 TO_{i,t} + \beta_4 WUI_{i,t} + \mu_{i,t} \quad (2)$$

where TI, ED, FD, TO and WUI imply tourism investments, economic development, financial development, trade openness and world uncertainty index, respectively. Similarly, i and t refer to cross-section and

Table 1
List of sample countries.

Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belarus, Bolivia, Botswana, Brazil, Bulgaria, Cambodia, Cameroon, Canada, Chile, China, Colombia, Costa Rica, Côte d'Ivoire, Croatia, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Finland, France, Gabon, Germany, Ghana, Greece, Guatemala, Hungary, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Korea, Kuwait, Kyrgyz Republic, Latvia, Lithuania, Madagascar, Malawi, Malaysia, Mali, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nepal, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, the Philippines, Poland, Portugal, Romania, Russia, Saudi Arabia, Senegal, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Tanzania, Thailand, Togo, Tunisia, Turkey, Uganda, Ukraine, the United Kingdom, the United States, Uruguay, and Vietnam.

[2] The WTTC (2019) defines tourism investments as follows: "*Investment includes capital investment spending by all industries directly involved in Travel and Tourism. This also constitutes investment spending by other industries on specific tourism assets such as new visitor accommodation and passenger transport equipment, as well as restaurants and leisure facilities for specific tourism use. This is consistent with total tourism gross fixed capital formation in table 8 of the TSA: RMF 2008*".

[3] WUI and EPU are used interchangeably in the paper.

time, respectively, while the error term is denoted by μ. As we previously highlighted, our primary focus in this research paper is to empirically investigate the role of world uncertainty on tourism investments across the panels of OECD, non-OECD, low-income, middle-income, and high-income economies. We aim to achieve this objective using the above model.

We use the controls in line with the literature (see, e.g., Alam & Paramati, 2017; Demir, Gozgor, & Paramati, 2019; Nadeem et al., 2020). In the baseline estimations, we use economic development (ED), that is the log per capita gross domestic product (GDP) (constant 2010 US$). The related data is obtained from the World Development Indicators (WDI) of the World Bank (2020). Index of financial development (FD) (which is constructed using the information on access, depth and efficiency of the financial markets and institutions) is also included. The related data are obtained from the Financial Development Index dataset of the International Monetary Fund (2020). Besides, trade openness (TO), which is measured by trade as a % of GDP is also included, and the data is obtained from the World Bank (2020).

Following the spirit of Gozgor (2018) and Potrafke (2015), in the robustness checks, we replace the measure of trade openness with the index of trade globalisation (TRDGLB). The index of trade globalisation is provided by Gygli, Haelg, Potrafke, and Sturm (2019), which is a comprehensive measure of international trade that accounts for various aspects of international trade. More specifically, the index of trade globalisation considers trade in goods and services, trade partner diversity, trade regulations, trade taxes, tariffs and trade agreements. The per capita GDP, financial development, and international trade are expected to positively drive tourism investments, while the EPU should have an adverse effect.

First, by following previous literature (e.g. Paramati, Apergis, & Ummalla, 2017; Paramati & Roca, 2019), we utilise cross-sectionally augmented IPS (CIPS) panel unit root test of Pesaran (2007), which accounts for cross-sectional dependence. After establishing consistent order of integration among the selected variables and by following previous literature (Alam & Paramati, 2016; Kutan, Paramati, Ummalla, & Zakari, 2018; Lu, Gozgor, Lau, & Paramati, 2019), we undertake the Fisher-type panel cointegration test using an underlying Johansen methodology of Maddala and Wu (1999). We then use two estimation techniques to obtain long-run coefficients. The first method is the Fully Modified Ordinary Least Squares (FMOLS) method of Pedroni (2001) based on the group-mean approach. The significance of this approach is that it uses a semi-parametric framework to address the potential issues of endogeneity and serial correlation that may present in the empirical models. The second method is the Common Correlated Effects Mean Group (CCEMG) of Pesaran (2006), which accounts for cross-sectional dependence and allows for heterogeneous slope coefficients across the countries. The CCEMG technique also allows for both "homogenous technology parameters" and "heterogeneous factor loadings" in the estimations; thus, it can eliminate "time-variant and unobservable" effects of uncertainty on tourism investments. In short, CCEMG method can successfully solve potential problems of "model identification" due to the significant cross-sectional dependence among countries (Pesaran & Tosetti, 2011).

4. Empirical findings, robustness checks, and discussions

4.1. Preliminary analysis

Table 2 reports the average and compounded annual growth rates on the selected variables and groups of nations. The growth rates of tourism investments (TI) are higher in low-income, upper-middle-income, and non-OECD economies as compared with OECD and high-income economies. Likewise, the growth rates of economic development (per capita GDP) are also higher in low-income and upper-middle-income economies. On the other hand, the financial development (FD) has higher growth rates in upper-middle-income and non-OECD economies, whereas OECD, high-income and low-income countries have less than 2% growth. Interestingly, the trade openness (TO) has higher growth rates in OECD and high-income countries, while other groups of economies have less than 1% growth. Finally, the growth rates of the uncertainty index are more than 4% across all the sub-samples; the highest growth rates are in OECD and high-income economies. Furthermore, it is also important to note that the average annual growth rates are slightly higher than the compounded annual growth rates across the variables and sub-panels. Overall, these growth rates suggest that the tourism investments and economic development have higher growth in low-income economies. In contrast, the EPU is a primary concern in developed economies (e.g. OECD and high-income economies) than those of the low-income economies.

4.2. Findings and discussion

In this paper, we aim to identify the potential determinants of tourism investments by paying attention to the EPU, economic development, financial development and trade openness across the panels of OECD, non-OECD, high-income, upper-middle and low-income economies. To achieve that, we begin our investigation by exploring the order of integration of the variables, the long-run equilibrium association, and long-run determinants of tourism investments. In the following, we provide empirical results and relevant discussions.

Table 3 displays the results of a panel unit root test, which addresses the issue of cross-sectional dependence. Much of the previous literature on tourism has ignored the issue of cross-sectional dependence and employed the methods that do not account for it. The conventional econometric methods assume cross-sectional independence in the data series, but in reality, this is not true. Hence, it is essential to apply the econometric techniques that account for cross-sectional dependence. Given this background, we use the CIPS unit root test as it is a robust method to handle the issue of cross-sectional dependence. The findings of the CIPS test confirm that none of the selected variables rejects the null hypothesis of a unit root at the level data across full sample, OECD, non-OECD, high-income, upper-middle-income and low-income

Table 2
Growth rates on the selected variables across the samples.

Samples	Average annual growth rates					Compounded annual growth rates				
	TI	ED	FD	TO	WUI	TI	ED	FD	TO	WUI
Full-sample	3.604	1.763	1.696	0.817	5.105	3.187	1.665	1.581	0.683	3.809
OECD	2.577	1.662	1.328	1.852	8.272	2.255	1.567	1.218	1.657	4.949
Non-OECD	5.782	2.075	2.112	0.317	4.474	4.799	1.953	1.974	0.203	3.300
High-income	2.408	1.606	1.358	1.331	7.540	2.080	1.514	1.247	1.159	4.939
Upper-Middle-income	6.150	2.586	2.543	0.085	4.671	5.204	2.442	2.386	−0.008	2.575
Low-income	8.558	2.823	1.735	0.776	5.758	6.818	2.680	1.603	0.640	4.080

Notes: The average data of each sample is taken to calculate both the annual averages and compounded annual growth rates. The above growth rates are computed using before log conversion data. TI: Tourism Investments, ED: Economic Development, FD: Financial Development, TO: Trade Openness, WUI: World Uncertainty Index.

Table 3
Evidence from the panel unit root test (CIPS).

Variable	Full-sample		OECD		Non-OECD		High-income		Upper-Middle-income		Low-income	
	Zt-bar	p-Value	Zt-bar	p-Value	Zt-bar	p-Value	Zt-bar	P-Value	Zt-bar	p-Value	Zt-bar	p-Value
Level												
TI	1.127	0.870	6.148	1.000	0.194	0.577	3.154	0.999	1.580	0.943	−0.201	0.421
ED	5.667	1.000	0.673	0.749	8.602	1.000	2.104	0.982	4.410	1.000	5.496	1.000
FD	1.600	0.945	0.542	0.706	0.394	0.653	−1.465*	0.072	4.175	1.000	1.774	0.962
TO	4.024	1.000	4.350	1.000	4.267	1.000	3.459	1.000	1.681	0.954	1.504	0.934
WUI	2.185	0.986	1.931	0.973	4.204	1.000	1.606	0.946	0.573	0.717	3.949	1.000
First difference												
TI	−19.070***	0.000	−10.884***	0.000	−15.447***	0.000	−11.937***	0.000	−9.661***	0.000	−10.527***	0.000
ED	−9.099***	0.000	−3.047***	0.001	−10.731***	0.000	−2.873***	0.002	−6.358***	0.000	−7.827***	0.000
FD	−27.595***	0.000	−14.060***	0.000	−23.850***	0.000	−15.382***	0.000	−15.730***	0.000	−15.800***	0.000
TO	−14.036***	0.000	−6.144***	0.000	−13.184***	0.000	−5.983***	0.000	−6.701***	0.000	−11.421***	0.000
WUI	−28.141***	0.000	−17.902***	0.000	−21.249***	0.000	−17.991***	0.000	−14.427***	0.000	−14.702***	0.000

Note: *** indicates the rejection of the null hypothesis of a unit root at the 1% significance level.

economies. However, the results indicate that the null hypothesis is firmly rejected for their first-order differences for all the variables in all the panels. These results imply that all the variables have the same order of integration.

It implies from the above results that the selected variables across the panels have the same order of integration. This evidence, therefore, indicates that there might be a long-run association among these variables. Hence, we employ a robust panel econometric technique, i.e. the Fisher-type Johansen cointegration test to investigate the long-run cointegration relationship among these variables. The results of a panel unit root test are presented in Table 4. The cointegration test results on the full sample, OECD, non-OECD, high-income, upper-middle-income and low-income economies reveal that the tourism investments are cointegrated in the long-run with economic development, financial development, trade openness and the EPU. These findings advise us that these variables as a group reach an equilibrium point in the long-run. The presence of a long-run equilibrium relationship is an indication that these variables might be having a significant cause and effect relationship in the long-run. Therefore, we explore their nature of association in the following.

To investigate the long-run effects of the EPU, economic development, financial development and trade openness on tourism investments, we apply the FMOLS method based on the group-mean approach. The significance of this approach is that it uses a semi-parametric framework to address the issues of endogeneity and serial correlation that may present in the model. Hence, the long-run estimates that are obtained from the FMOLS method are robust and reliable. The results of this approach are displayed in Table 5.

Our long-run estimates across the panels such as a full sample, OECD, non-OECD, high-income, upper-middle and low-income economies show that an increase in EPU has a significant negative impact on tourism investments and the coefficients are statistically significant. However, the increase in economic development, financial development and trade openness positively contribute to tourism investments. Among these indicators and across the panels, economic development and trade openness are the significant determinants of tourism investments. Further, this evidence advises that the EPU in these groups of economies can adversely affect the tourism investment in the first instance and then the tourism sector as a whole. Therefore, the policy officials need to be aware of this fact, which helps them to mitigate the adverse impact that is expected from the EPU on tourism investments.

4.3. Robustness checks

For the robustness purposes, we again run these models by replacing trade openness with trade globalisation (TRDGLB). We consider trade globalisation because it is measured comprehensively and accounts for various aspects of international trade. These results are also displayed in Table 4. The findings reveal that the EPU adversely affects tourism investments, whereas economic development, financial development and trade globalisation positively contribute. Given these findings, we argue that the degree of impact from trade globalisation to tourism investments is more than the trade openness. The effects from remaining indicators on tourism investments are consistent with the previous estimates. All of these parameters are statistically significant.

Again for the robustness purpose, we estimate these models by making use of the CCEMG approach. We do this because; the CCEMG method takes into account of cross-sectional dependence in the

Table 4
Evidence from the panel cointegration test.

Hypothesised	Fisher statistics											
No. of CE(s)	Trace test	Prob.	Max-eigen test	Prob.	Trace test	Prob.	Max-eigen test	Prob.	Trace test	Prob.	Max-eigen test	Prob.
TI = f (ED, FD TO, WUI)												
	Full-sample				OECD				Non-OECD			
None	2725.000***	0.000	1762.000***	0.000	866.900***	0.000	536.200***	0.000	1858.000***	0.000	1226.000***	0.000
At most 1	1371.000***	0.000	894.200***	0.000	446.400***	0.000	306.500***	0.000	924.900***	0.000	587.700***	0.000
At most 2	674.100***	0.000	466.900***	0.000	202.200***	0.000	141.500***	0.000	471.900***	0.000	325.300***	0.000
At most 3	388.800***	0.000	313.300***	0.000	117.500***	0.000	97.440***	0.005	271.300***	0.000	215.900***	0.000
At most 4	368.100***	0.000	368.100***	0.000	107.100***	0.001	107.100***	0.001	260.900***	0.000	260.900***	0.000
	High-income				Upper-middle-income				Low-income			
None	1004.000***	0.000	594.500***	0.000	833.800***	0.000	529.300***	0.000	887.600***	0.000	638.100***	0.000
At most 1	539.800***	0.000	346.300***	0.000	441.700***	0.000	283.400***	0.000	389.800***	0.000	264.500***	0.000
At most 2	266.600***	0.000	172.900***	0.000	219.500***	0.000	165.200***	0.000	187.900***	0.000	128.800***	0.000
At most 3	163.400***	0.000	131.100***	0.000	107.500***	0.000	87.790***	0.007	117.900***	0.000	94.430***	0.019
At most 4	141.700***	0.000	141.700***	0.000	106.600***	0.000	106.600***	0.000	119.700***	0.000	119.700***	0.000

Note: *** indicates the rejection of the null hypothesis of no cointegration at the 1% significance level.

Table 5
Long-run estimates using group-mean (FMOLS) approach.

Variable	Full-sample		OECD		Non-OECD		High-income		Upper-middle-income		Low-income	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
TI = f (ED, FD, TO, WUI)												
ED	1.981***	0.000	1.220***	0.000	2.334***	0.000	1.419***	0.000	2.042***	0.000	2.558***	0.000
FD	0.301***	0.000	0.102***	0.000	0.393***	0.000	0.176***	0.000	0.298***	0.000	0.443***	0.000
TO	0.359***	0.000	0.140***	0.000	0.461***	0.000	0.182***	0.000	0.439***	0.000	0.489***	0.000
WUI	−0.076***	0.000	−0.035**	0.011	−0.095***	0.000	−0.056***	0.000	−0.120***	0.000	−0.061*	0.056
Robustness check results (trade openness replaced with trade globalisation)												
ED	2.318***	0.000	1.151***	0.000	2.859***	0.000	1.306***	0.000	2.333***	0.000	3.435***	0.000
FD	0.239***	0.000	0.052***	0.000	0.325***	0.000	0.081***	0.001	0.264***	0.000	0.393***	0.000
TRDGLB	0.513***	0.000	0.382***	0.000	0.573***	0.000	0.525***	0.000	1.000***	0.000	0.086***	0.003
WUI	−0.132***	0.000	−0.016***	0.000	−0.186***	0.000	−0.087***	0.000	−0.101***	0.000	−0.210***	0.000

Note: ***, **, and * indicate the significance levels at the 1%, 5%, and 10%, respectively.

estimation. The results of CCEMG are reported in Table 6. The results on the first part of estimates indicate that economic development has a significant positive impact on tourism investments across the panels. Furthermore, our estimates show that the rise in financial development is also positively contributing to tourism investments but statistically significant only in non-OECD and low-income economies. The evidence suggests that financial development has a more substantial role in tourism investments, particularly in less developed economies. Specifically, the increasing roles of banking and financial markets can assist the tourism firms to expand their business by providing easy and low-cost capital on a timely basis. This issue is particularly an essential issue in less developed economies, where the cost and availability of capital is very high and low, respectively. Therefore, increasing financial development can promote the tourism investments and the expansion of the tourism industry. The evidences on trade openness show that its' impact is positive and statistically significant across all the panels. It, therefore, suggests that the trade openness positively contribute for tourism investments in the selected countries. The increase in the EPU negatively affects tourism investments across all the sub-samples but statistically significant only in the full sample.

The second part of estimates, with trade globalisation, also show that the increase in trade globalisation has a positive impact on tourism investments in all the panels but significant only in the full sample and non-OECD economies. We observed similar effects from economic development and significant in all the cases. The financial development has a positive and significant impact on tourism investments only in the full sample, non-OECD and low-incomes economies. Finally, the EPU continue to hurt tourism investments but again significant only in the full sample and high-income economies.

Overall, these estimates across the methods, panels and measurements indicate that the EPU is a significant impediment for the stability of tourism investments across the selected groups of economies. Therefore, we advise the policymakers to be aware of the fact that the EPU can adversely affect the tourism investments, so need to consider this issue while designing the policies on sustainable tourism investments across these economies. We discuss relevant policy implication in the next subsection.

4.4. Policy implications

We show that a higher level of EPU decreases tourism investments. Our main finding is in line with the previous studies that focused at the firm-level (Chen et al., 2019 for the United States firms; Wang et al., 2014 for the Chinese firms) and at the country-level (Meinen & Röhe, 2017 for Germany, France, Italy, and Spain; Panagiotidis & Printzis, 2020 for Greece). Based on this evidence, we provide several policy implications for governments/regulatory bodies and firms that engage in the tourism industry.

Our measure of uncertainty, the World Uncertainty Index, is constructed based on country-specific reports focusing on economic and political developments. This index gives a higher weight to domestic events and developments compared to the index of EPU. Therefore, the governments and regularity bodies should take necessary actions to decrease the uncertainty generated by the local economic and political events. A transparent economic decision-making environment and smooth transitions in economic policies will help to lower the uncertainty. Decreasing uncertainty will enhance tourism investments, which will boost not only tourism development but also positive economic benefits. On the contrary, rising uncertainty will cause a decrease in tourism investments, which will lower both the quantity and quality of

Table 6
Long-run estimates using CCEMG approach.

Variable	Full-sample		OECD		Non-OECD		High-income		Upper-middle-income		Low-income	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
TI = f (ED, FD, TO, WUI)												
ED	2.033***	0.000	2.020**	0.046	1.901***	0.000	2.450***	0.001	1.715***	0.002	2.857***	0.001
FD	0.170	0.133	0.018	0.947	0.371**	0.019	0.005	0.982	0.232	0.151	0.530**	0.043
TO	0.666***	0.000	0.881*	0.080	0.328***	0.002	0.878***	0.008	0.409***	0.004	0.311*	0.077
WUI	−0.131*	0.095	−0.104**	0.038	−0.053*	0.055	−0.065**	0.046	−0.001*	0.092	−0.284*	0.056
Constant	1.007	0.889	3.689	0.772	6.968	0.453	3.257	0.777	0.578	0.941	9.967	0.423
Trend	−0.004	0.832	−0.005	0.777	0.026	0.389	0.003	0.869	0.010	0.735	0.021	0.680
Robustness check results (trade openness replaced with trade globalisation)												
ED	1.961***	0.000	1.543*	0.078	1.912***	0.000	1.557**	0.042	1.339**	0.036	3.349***	0.000
FD	0.204*	0.091	0.240	0.403	0.379***	0.008	0.262	0.276	0.226	0.128	0.509*	0.057
TRDGLB	0.594***	0.004	0.080	0.942	0.576***	0.003	0.740	0.225	0.301	0.336	0.083	0.748
WUI	−0.187***	0.009	−0.151*	0.099	−0.103*	0.053	−0.208**	0.014	−0.091**	0.046	−0.082*	0.052
Constant	0.414	0.941	4.538	0.650	−1.139	0.888	−0.526	0.948	−6.780	0.137	10.767	0.482
Trend	−0.009	0.603	0.002	0.917	−0.007	0.787	−0.001	0.940	−0.003	0.876	0.007	0.894

Notes: ***, **, and * indicate the significance levels at the 1%, 5%, and 10%, respectively. The cross-section averaged regressors are not reported.

the supply side of tourism. This issue will lead to unmet the demand that is generated from the tourism sector, which then causes for the reduction in revenues, and then cause for customers' dissatisfaction (Turner & Hesford, 2019).

In case, the origin of uncertainty is non-domestic, then coping with the uncertainty can be relatively tricky. Even in this circumstance, the governments should take the necessary actions to decrease the effects of global uncertainty on the domestic market. In particular, the Governments in cooperation with the related ministries (such as the Ministry of Tourism and Ministry of Economics) can develop strategies to create incentives for companies to undertake tourism investments in uncertain periods. Such incentives could be tax exemptions, deferment of tax payments, and land allocation to tourism projects in some specific cities or regions can be provided.

Moreover, the governments can open new credit channels for tourism companies to finance their investments, as banks are less willing to provide credits in uncertain periods. This policy can be especially vital for small and medium-sized enterprises. The government can act as a guarantor for those loans to a certain threshold. Another approach to deal with the uncertainty can be a private-public partnership (PPP) projects in tourism. Under this scheme, the governments contract a private company to finance, design, construct, operate and maintain a project in return for future income. The PPP projects can include leisure centres, concert halls (Tribe, 2011) and other tourism-related infrastructure facilities.

On the other hand, the ongoing COVID-19 pandemic has caused enormous uncertainty within the policy circle and economy as a whole. Further, the COVID-19 has restricted the mobility of people and goods. Consequently, the pandemic has adversely affected the tourism demand and so is the case on tourism investments. We expect that the tourism investments will fall significantly due to lack of demand for tourism services and also due to raising uncertainty and economic recession across the globe. However, we advise the policymakers and government officials to back up the tourism investments as it helps the sector to upgrade to more environmental friendly services. Specifically, we advise that the governments should ensure low cost capital support for the tourism companies that are willing to invest for adopting green transportation vehicles, renewable energy and sustainable activities. This will therefore warrant that the tourism sector will be ready to offer environmental friendly services once restrictions are eased.

5. Conclusion

In this paper, we investigated the role of the EPU on tourism investments across the samples of the OECD, non-OECD, high-income, upper-middle-income, and low-income economies. We addressed cross-sectional dependence and endogeneity issues while investigating long-run estimates. We incorporated economic development, financial development, and trade openness indicators in the panel data set of 101 countries for the period from 1996 to 2016. Using several model specifications, we considered robust estimates on the determinants of tourism investments. The findings from CCEMG and the FMOLS approaches showed that the EPU has a significant negative impact on tourism investments across the panels. On the contrary, we found that the economic development, financial development, and trade positively contribute to tourism investments.

Given these findings, we provide several implications in regards to the EPU and tourism investments. More specifically, we suggest that the policymakers need to initiate effective policies to counter the uncertain events that are adversely effecting tourism investments across the economies of OECD, non-OECD, high-income, upper-middle-income, and low-income economies. The policies could be in the form of encouraging tourism firms by providing tax incentives and backing up their capital acquisition to make stable investments in the tourism sector, mainly when there are unstable economic and political occurrences in their respective economies. Further, the policy authorities need to implement PPP investments in tourism infrastructure. It is expected that; all these policies would assist the tourism sector in sustaining even in situations of when there is a significant uncertainty in those economies. If the policymakers do not take necessary and timely policy initiatives to counter growing uncertainty, then this could lead to having a severe adverse impact on the tourism sector and in turn on the overall economy. Finally, we advise that the future studies on this subject can use the quarterly data and time-series estimation techniques to investigate the impact of uncertainty shocks on indicators of tourism in large developing economies such as China, India, Mexico and Turkey if data becomes available for a more extended period.

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