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EFFECT OF GLOBAL UNCERTAINTY ON INTERNATIONAL ARRIVALS BY PURPOSE OF VISITS AND LENGTH OF STAY.

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THE EFFECT OF GLOBAL UNCERTAINTY ON TOURISM ARRIVALS BY PURPOSE OF VISIT AND LENGTH OF STAY

Abstract

This paper investigates the effects of economic and political uncertainties on tourism demand using the 'World Uncertainty Index' (WUI). This index is more a sophisticated and reliable measure of global uncertainty than previous indices used by the literature. The findings show that uncertainty shocks affect travels for business, holidays, and visiting friends/relatives purposes negatively. It is statistically significant for duration of stay of 1 week to less than one month in Australia. This effect dissipates for longer stays. This study provides insightful information to destinations on how consumers adjust their behaviour during period of political and economic uncertainty.

Keywords

World Uncertainty Index, Length of Stay, Panel Data, Tourism Demand, VFR, Business

1. Introduction

Tourism demand is primarily affected by economic factors such as income and prices (Seetaram, 2012) but there are other variables that have been shown to affect demand negatively. These are crises such as natural calamities, political instability, terrorism, and health crisis. Fletcher and Morakabati (2008) examine the effect of terrorism and other types of political unrest on tourism arrivals in Kenya and Fiji and conclude that internal political crisis is more detrimental to tourism than one-off acts of terrorism. The SARS outbreak, the Asian financial crisis and the global financial crisis have affected global demand directly and indirectly. The direct effect occurs because of an increase in barriers to travel and negative sentiments towards travel. The indirect effect occurs through the political and economic uncertainty that often follows such events. Eberly (1994) states that when there are uncertainties surrounding income, consumers tend to postpone the consumption of non-necessary items. Tourism is one such product.

Analysing the effect of uncertainty on tourism demand has never been more relevant than in this current world situation, where the global health crisis associated with the COVID-19 pandemic has not only impacted the health of the global population but has developed into an economic and political crisis in many parts of the world leading to uncertainties of a global scale. The previous literature has used the Economic Policy Uncertainty (EPU) index developed by Baker et al. (2016) to assess the effect of uncertainty and geopolitical risk on the hospitality and tourism industry. See, for example, Chen et al. (2020), Demir and Gozgor (2018), Dragouni et al. (2016), Gozgor and Demir (2018), and Lu et al. (2020). However, Ahir et al. (2018) state that the EPU is available for only a small set of developed countries, limiting research and constructed the World Uncertainty Index to account for global economic and political uncertainties (Ahir et al., 2018) using data from the Economist Intelligence Unit (EIU) reports

of 143 countries. It is a more specific measure of global uncertainty. While this index is popular in the finance and economic literature, studies on its impact on the tourism industry are scant. To the best of the authors' knowledge, the only other research in tourism that uses the WUI is Chiadzwa et al. (2020), who assess the effect of risk on travel in five regions. Their findings suggest that following the rise in uncertainty, expenditure in Europe is positively affected, but the effects in the African regions and the Middle East are negative.

This paper proposes to analyse consumer behaviour by studying how global uncertainty affects travel behaviour using the WUI. It postulates that consumers are not only affected by local uncertainty and risk but by global events. The paper assumes that a local crisis that increases global uncertainty will affect travel from another part of the world because the perceived risk associated with international travel goes up. For example, a crisis in the USA may affect the behaviour of a British consumer regarding the decision whether to take a trip to Australia or not. This study's findings will provide important insights to destinations on how consumers adjust their behaviour amid political and economic uncertainty that is likely to arise post the COVID-19 pandemic.

The paper uses data from Australia. Tourism is one of Australia's largest export industries, and it has been growing faster than the Australian economy. It accounts for 3.9% of the national GDP and an important source of regional development and employment. Recent events such as the wildfires in Australia broadcasted in the media across the world have drawn much attention and fears on behalf of potential travels that may affect the future of this destination. Australia has, however, fared much better in its handling of the Covid 19 pandemic. Compared to the rest of the developed world, the level of infections and deaths is much lower, which has attracted many positive comments in the media. These will be of consequence for the recovery of the sector in the post-pandemic phase. The high level of the global economy uncertainty that will continue to prevail may adversely affect the industry despite its positive depiction in the media during the pandemic. Period of economic uncertainty tends to lower consumption, private investment, and government spending in the sector, which trickles down in the form of a fall in citizens' welfare. Therefore, it is essential to determine the degree of past global uncertainty on inbound tourism in Australia to understand better how the market will react when faced with uncertainty in the future.

In Chiadzwa et al. (2020), the authors use spending levels and arrivals for six regions worldwide as the dependent variables. This paper, however, only include explanatory variables which are related to conflicts and crisis. It does not consider economic variables such as price and income, which are established demand determinants. It cannot comment on the role these variables or their interaction with crisis play in determining spending or arrivals to different regions of the world and Africa. This current study proposes a comprehensive analysis of demand measured by total arrivals, arrivals by seven purposes of visits, and duration of stay. It contributes to the literature by analysing the effect of uncertainty on length of stay and arrivals by purpose of visit. The disaggregation level in the demand variables provides more valuable information on the market and can analyse each segment's impact, which is useful for targeted responses. The importance of duration of stay for destinations is discussed in Massidda, Piras and Seetaram (2020). The longer stay provides the travellers with more opportunities for consumption and is important for accommodation providers. Yet, very few academic researches focus on this variable, although the trend is starting to change. The study uses data for thirteen

of Australia's key markets extending over eleven years. Various econometric techniques, such as the fixed-effects, Least Squares Dummy Variable Corrected (LSDVC), Dynamic Common Correlated Effects (DCCE), and implemented and used to test the robustness of the results.

The rest of the paper is organised as follows. The next section provides a brief review of the previous papers. Section 3 explains the data, model, and econometric techniques. Section 4 reports the empirical findings. Section 5 provides a conclusion.

2. Literature Review

Tourism demand remains the most prolific research area in the literature on tourism which uses economics as the lens through which the sector is analysed. Applying classical economic reasoning, researchers have demonstrated that demand for tourism is determined by consumers' income, price of the products, and substitutes' prices. The conclusion is that tourism tends to be a luxury product with negative price elasticities. Whether the demand is elastic or not may depend on the market segment. Business travellers are on one end of the spectrum and are the least sensitive to price changes, while those travelling for leisure or holiday are on the other end. VFR (visiting friends and relatives) travellers find themselves somewhere in between.

More recently, however, demand models have been augmented with additional non-traditional explanatory variables making forecasting more challenging but even more vital (Song et al., 2019). Specifically, factors such as migration (Dwyer et al., 2014; Forsyth et al., 2012; Seetaram, 2012a; Seetaram and Dwyer, 2009), taxation (Seetaram et al., 2014), investment in transport infrastructures (Gao et al., 2019), weather, climate change and air quality (Falk and Lin, 2018; Li et al., 2018; Wang et al., 2018), cultural proximities (Petit and Seetaram, 2019) have become increasingly relevant in tourism demand modelling. The effect of risk and uncertainties on demand has hitherto received some interest in the literature. For example, demand models have been estimated with explanatory variables to account for the outbreak of diseases, financial crises, and natural disasters. Many studies have merely controlled these factors using dummy variables (Seetaram, 2010; 2012a,b; Seetaram et al., 2016). However, other studies have used specific measures for disasters (Wu et al., 2020), terrorism (Hamadeh and Bassil, 2017; Mitra et al., 2018) and the outbreak of diseases (Kuo et al., 2009) to estimate actual elasticities and account for their impact. Unsurprisingly, the authors demonstrate that crises have negative effects on demand.

The literature on the role of uncertainty in demand is currently booming. Eberly (1994) postulated that consumers are more conservative with their expenditure in periods of uncertainty. This finding is explored in Gunter and Smeral (2017), who use data from 15 European Union countries to show that tourists are more volatile during economic stagnation. During this time, they are more budget-conscious, and their income elasticity tends to be higher. Although the situation improves when economic growth picks up, travellers choose to satisfy pent-up demand for necessary products instead of travel and holidays. In times of low economic growth, however, travel demand becomes more inelastic than during stagnation.

Uncertainty, however, is difficult to measure. The development of the Economic Policy Uncertainty index (EPU) by Baker, Bloom and Davis (2016), which is publicly available, has made the task of assessing its effect on demand considerably less complicated. The index is available from 1997 for several OECD countries. According to the authors, there is a strong

correlation between the index developed and its macroeconomic stability under study. An increase in the index is followed by negative growth and employment. This index has become the preferred index of authors such as Ongan and Gozgor (2017) and Ongan and Gozgor (2018). The former studied domestic tourism spending in the USA using quarterly data and find that a rise in the index led to a decline in the dependant variable in the long run. Using quarterly data on international arrivals, Gozgor and Ongan (2018) find that an increase in the EPU leads to a decline in Japan's arrivals to the USA in the long run.

Applying the EPU to the Asian market, Chen et al. (2020) demonstrate that demand for hotel rooms in Taiwan from Japanese and mainland Chinese tourists is significantly lower during periods of the trough and economic uncertainties. However, unlike the findings from Ongan and Gozgor (2017) and Ongan and Gozgor (2018), the effect here is short-lived. Tiwari et al. (2019) also find only a short-run effect of the EPU on India's tourist arrivals. These studies, however, compared different types of risks. It analyses the effect of geopolitical risks on-demand. It concludes that this type of risk is more detrimental and its effect persists in the long run, unlike economic uncertainty, which only affected demand in the short run. However, a prolonged combination of geopolitical risk and uncertainty significantly dampen growth in the long run. According to Madanoglu and Ozdemir (2019), who also studied the USA's hospitality industry using data expanding over ten years, the negative effect of uncertainty is persistent.

Işık et al. (2020) use data for travel from Mexico and Canada to the USA and find that the EPU has a detrimental effect on arrivals from these sources and that Canadian tourists are more responsive to the EPU. Using data from 2000 to 2019, Khan et al. (2021) showed that the EPU granger causes international tourist arrivals in the UK, and this relationship is negative. Nguyen, Schinckus, and Su (2020) are the first to assess the effect of the EPU on international outbound tourism using data from 82 countries over 13 years. They note a few interesting results. While the EPU is negatively affecting outbound tourism, it positively affects the ratio of tourism expenditure over GDP. The authors speculate that because uncertainty reduces the number of trips tourists take, they may consolidate their budget by spending more average. However, this finding is counter-intuitive and refutes the arguments provided in Eberly (1994).

Tsui et al. (2018) focus on business travel to New Zealand in a gravity model. They use both the EPU of New Zealand and that of the home country in their regression. They also added the Global Financial Crisis of 2008/09 and the Christchurch earthquakes of 2011/12 as explanatory variables to account for crisis and instability in their model. The authors find that only the EPU in New Zealand can influence international arrivals for business purposes, while the other proxies for uncertainty are statistically insignificant. However, the negative effect of the EPU of New Zealand is considerably lower than distance, which is the main driver of demand for New Zealand business purposes. The elasticity associated with the latter is -1.48, while the EPU elasticity is -0.06.

Finally, Ghosh (2020) investigates the arrivals from China to Australia because China is one of its key markets. He uses a new index specific to the Covid-19 pandemic called the Discussion about Pandemics Index and uses quarterly data on arrivals from 1996 to 2020. This paper's main finding is that consumers' response to uncertainty is asymmetric. A one percent increase in uncertainty reduces China's arrival to Australia by 10 percent, indicating very high responsiveness but comparable declined in uncertainty will only lead to an increase in arrivals of 0.22 percent.

According to Ahir et al. (2018), however, because the EPU is constructed using data from local sources such as newspapers, it cannot be used to compare uncertainties across countries. Furthermore, it is only available for a small group of counties and therefore, its application is limited and cannot be extended, especially to less developed countries. Ahir et al. (2018) propose a new index, the World Uncertainty Index (WUI), to measure uncertainty across the world. Because this index is constructed using country reports from the Economist Intelligence Unit, it is available for many countries and is comparable. The application of the WUI is gaining momentum and used in Chisadza et al. (2021).

Chisadza et al. (2021) consider six regions, the World, Europe, Africa, Asia, Middle East, America. They find that uncertainty is significant in explaining arrivals in Africa, Asia, and Europe only. While the first two regions' effect is negative, the author finds that uncertainty increases arrivals in Europe. The authors explain this effect by freedom of movement in Europe, which reduces the cost normally associated with border control. However, these results may be indicating that having a common currency reduce risk and uncertainty related to fluctuation in the exchange rate and Europe being one of the largest tourist generating regions, in the situation when global uncertainty increases, travellers chose to travel to a destination closer to home and therefore, arrivals within Europe rises at the detriment of the other regions in the world pointing to a substitution effect. A similar argument can be used to explain the positive effect found within the African region. The WUI is significant for the North, East and West but while an increase in uncertainty reduces demand in the North and the West, in the East the effect is positive. The authors explain these interesting results stating that during the period of global uncertainties, a crisis such as the Ebola outbreak in West Africa and other local conflicts have contributed to making the North and the West less competitive, benefiting the Eastern parts of the continent.

According to the literature tourism demand can be measured using data on expenditure, arrivals, or duration of stay. While all three measures are important, their relative importance to destinations can vary. A destination that is growing may seek to increase the number of arrivals. In contrast, other destinations may be more interested in tourism yield and aim at increasing benefits from the sector by focusing on spending. Simultaneously, the accommodation industry is more concerned with the duration of stay at destinations related to their revenue generation. The literature presented highlights the main gaps which this paper seeks to address. This paper is the first to investigate the effect of uncertainty on the duration of stay of travellers.

Tsui et al. (2018) is the only study which took into account a different market segment. It focus on business travellers. The information on how travellers motivated by different purposes respond to changes in uncertainty is yet to be assessed. This study fills this gap by using the WUI measure that harmonises significant political and economic uncertainties in assessing how uncertainty affects tourist arrivals split across the duration of stay, seven purposes of visits and thirteen sources of arrivals.

3. Data, Model and Estimation Procedures

3.1. Data

This paper investigates the effects of economic policy uncertainty, measured by a new index, the so-called "World Uncertainty Index (WUI)," on tourist arrivals in Australia. The

WUI data are obtained from Ahir et al. (2018). This index has two advantages over the EPU. First, unlike the former that used data from local newspapers, the WUI is constructed for 143 nations with a population of at least 2 million using EIU their country reports from 1990Q1 to 2020Q4. This issue makes the index more comparable. Second because it is inclusive, unlike the EPU, which is available for a small set of countries only. The WUI is computed by counting the number of times the word's uncertain, or variants are used in the report (or the variant) in EIU country reports. "*The WUI is then normalised by the total number of words and rescaled by multiplying by 1,000. The WUI is then normalised by the total number of words, rescaled by multiplying by 1,000. A higher number means higher uncertainty and vice versa*" (Ahir et al., 2018, pp16*).* This index is highly correlated to stock market volatility and allows the country's individual fixed effects Ahir et al. (2018). Figure 1 shows how the trend in the WUI from 1990Q1 to 2020Q4. It demonstrates how crisis around the world which has led to uncertainty relates to the WUI values.

INSERT FIGURE 1

The sample used in this study is made up of data on the number of total international tourist arrivals from 13 countries from 1996 to 2017 to Australia. They are Canada, China, Germany, Hong Kong, India, Indonesia, Japan, Korea Republic, Malaysia, New Zealand, Singapore, the United Kingdom, and the United States. These countries account for more than 95% of total international arrivals in Australia during the period under study. In the first instant, demand in this paper is measured by total international short-term arrivals and the visit's purpose. Based on the data available, seven categories or purposes are considered. They are business; convention/conference/exhibition; education; employment; holiday; visiting friends/relatives; and other purposes. The analysis is extended to the duration of stay of the international visitor. Again based on data availability, seven categories are considered (under one week, one week-two week, two weeks-1 months, one month-two months, two months-three months, three months-six months, and six months-twelve months). These data are obtained from the Australian Bureau of Statistics (2020).

The control variables included are inspired by previous research (e.g., Song et al., 2019). Per capita real gross domestic product (GDP) and exchange rates are included to capture the income and the price effects. The home country population is a proxy for the market size (Can and Gozgor, 2018). The inflation rate is used to capture the macroeconomic stance. Another set of controls addresses to effects of globalisation on tourism demand. Globalisation indicators refer to international networks in tourism demand modelling. For this purpose, trade openness and the KOF index of overall globalisation provided by Dreher (2006) and Gygli et al. (2019) are used. Finally, following previous papers (e.g., Gozgor et al., 2019), various indicators for quality of institutions, such as the indices of democracy, the executive constraints concept, and Polity2 (democracy/autocracy spectrum), are included. Institutional quality indicators are obtained by Marshall et al. (2019). The exchange rate data are downloaded by St. Louis FED (2020). All other control variables are obtained from the World Bank (2020). Table 1 reports the details of all variables in the dataset. All variables are in the log except for the Polity2, an index ranging from -10 to + 10.

INSERT TABLE 1 HERE

3.2. Model and Estimation Procedures

The following equation is estimated to examine the effects of uncertainty shocks on inbound tourism in Australia:

$$INBT_{i,t} = \gamma_0 + \gamma_1 INBT_{i,t-1} + \gamma_2 WUI_{i,t} + \gamma_3 X_{i,t} + \vartheta_t + \vartheta_i + \varepsilon_{i,t} \quad (1)$$

where, $INBT_{i,t}$ is the dependent variable measuring demand from country *i* at time *t*. $INBT_{i,t-1}$ indicates previous years' demand. This lagged dependent variable is included because demand for tourism in Australia has been dynamic (Seetaram, 2010, 2012a, and 2012b). This variable's coefficient shows the extent to which demand in the current year depends on on-demand in the previous year, and it and measures the effect of habit persistence. Both variables are included in logarithmic forms. $WUI_{i,t}$ is the current measure of uncertainty in the world. $X_{i,t}$ indicates the "vector of controls variables." Finally, ϑ_t, ϑ_i, and $\varepsilon_{i,t}$ denote the "time fixed-effects", the "country fixed-effects", and the "error terms", respectively. Various econometric techniques are used to estimate the empirical model in Eq. (1). First, the models are estimated by the fixed-effects estimations, a standard technique in the empirical literature. Clustered standard errors at the country level are used to capture potential autocorrelation and heteroscedasticity.

At this stage, issues arising from endogeneity cannot be dismissed. Therefore, the Least Squares Dummy Variable Corrected (LSDVC) estimations of Bruno (2005) are also applied to address potential problems of endogeneity and reverse causality. The LSDVC estimation is a particular form of the well-known dynamic panel data estimations, which is suitable for the cases of less than 20-panel units. Given that 13 countries are included in the panel dataset, the LSDVC estimation technique is more suitable than the dynamic panel data estimations. For more examples of applying this estimation technique in tourism, see, e.g., Seetaram (2010).

Furthermore, the Panel Fully Modified Ordinary Least Squares (PFMOLS) and the Panel Dynamic Ordinary Least Squares (PDOLS) estimation techniques allow only estimating long-run parameters. Here, the Pooled Mean Group Estimation (PMGE) and the Mean Group Estimation (MGE) methods allow estimating both short-run and long-run parameters. Therefore, the homogeneity of long-run parameters are determined using the Hausman test and calculate the Cross-sectional Dependence (CD) test. However, the PMGE method does not account for cross-sectional dependence, and the MGE method does not consider the dynamic common correlated effects. These issues are addressed by applying the Dynamic Common Correlated Effects (DCCE) estimations provided by Chudik and Pesaran (2015). It also solves a potential problem of inconsistency. If the lagged dependent variable is not strictly exogenous, the results will become inconsistent. The estimation procedure introduced by Ditzen (2016) is considered. This procedure estimates the DCCE by allowing homogeneous and heterogeneous coefficients as well as endogenous regressors. Thus, the DCCE estimation method can also solve the potential problem of endogeneity. It is also a robust method since it can be used in balanced and unbalanced panels. There is also a small sample time-series bias correction, which is a vital issue for our estimations.

4. Empirical Findings and Discussion of Results

4.1. Fixed-Effects Estimations

Table 2 shows the fixed effects estimates for the WUI of 13 countries on total tourist arrivals in Australia. The results show that irrespective of the model used, demand for Australian

tourism is negatively affected by uncertainty with a 5% level of significance. Models II and III are retained. This evidence concurs with the findings from the literature. Like India (Tiwari, 2019), Africa (Chiadzwa et al., 2020), USA (Işık et al., 2020), and Taiwan (Chen et al., 2020), Australia is susceptible to uncertainty. The result shows that the WUI is a valid proxy for global uncertainty and can be used as an explanatory variable in tourism demand models. In the model, only the dependent variable is log-transformed, and the WUI, which is an index, is not. To obtain the responsiveness of demand, the following is used: responsiveness = $(e^{\gamma_2} - 1) * 100$, where γ_2 is the value of the estimated coefficients in Eq. (1).

A rise in uncertainty will lead to a fall in the total number of tourists that visit Australia in a year. On average, a one unit rise in the WUI will lead to about a 17% fall in short-term international arrivals. This evidence shows that the WUI can explain a sizeable portion of the variation in the tourism sector.

INSERT TABLE 2 HERE

The impact of real GDP per capita is positive at one percent level of significance, affirming that per capita income increases the demand for tourist visits to Australia. With more income, travellers will be able to afford travel expenditure to Australia, as is Ongan and Gozgor (2018) for the United States. However, with an elasticity of less than one, the finding corroborates those of Seetaram (2012a) and means that travellers treat their trip to this destination as a necessity. This evidence is interesting because it shows that while an increase in income does not lead to a more than proportionate rise in demand, a fall in income will also not hit the destination as badly. This evidence confirms the previous literature on tourism demand modelling in that international trips to Australia is normal products. The exchange rate on tourist arrivals in Australia is negative and significant in two Models II and III. This finding is similar to that of Chen et al. (2018) in Taiwan. Appreciation of the exchange rate is harmful to tourism demand in Australia, and the effect is higher than that of income. Travelers to Australia are more responsive to changes in the exchange rate than to changes in income. Australia is a relatively expensive destination, especially for long-haul markets such as the UK, USA, and Germany. Appreciation of the Australian dollar adds pressure on the consumers' budget and makes the destination relatively dearer, especially to budget travellers.

Other control variables in the model, such as population, inflation rate, trade openness, globalisation, democracy, executive constraints, and polity, significantly affect the tourist visits recorded in Australia. The R-square is over 80% value in the regression shows that the model's variables explain over 80% of the dependent variable's variations (tourist arrivals). The next step is to verify whether uncertainty affects all travellers in the same manner. This evidence is achieved by using international arrivals by purpose of visit as the dependent variable. The results are provided in Table 3.

INSERT TABLE 3 HERE

Here the results point out that only three out of the seven purposes of visit are affected by uncertainty. These are Business, VFR, and Holiday, for which the uncertainty index is significant and negative. This evidence entails a decrease in business, family, and holiday-related visits to Australia from 13 source markets with an increase in uncertainty. It is worth noting that the magnitude of the effect is different for three categories of travellers. The most affected are holidaymakers with responsiveness of -36.6%. The market is also the most highly responsive to changes in the exchange rate, with an elasticity of -0.8. According to Walters et

al. (2014), tourism demand can be expected to fall during periods of crisis because of media coverage of the event, which can lack accuracy but influence consumers' behaviour. Because holidaymakers are less subject to time constraints and more are flexible travelers than the other group, they may also be more able and willing to adjust their behavior during adverse conditions. This research shows that demand from this market is considerably reduced when uncertainty is increased. It does not rule out that pent-up demand may follow when economic and political uncertainty rises.

The second most affected groups are business travellers. This evidence clearly shows that business investors shy away from Australia during high uncertainty. According to Bloom, Bond, and Van Reenen (2007), higher uncertainty causes firms to be more cautious in their investment decisions and to the point of being less responsive to expansionary measures taken by authorities. When investment fall, the need for business-related travel falls as well. Moreover, during periods of uncertainty, businesses face drawbacks such as irregular cash flows. Their degree of risk aversion may increase, and the need for cutting costs may lead to restricting business-related travels. It is, therefore, expected that an increase in uncertainty would reduce demand for business travel. This study shows that demand for business travel to Australia will fall by 18.9% following an increase of 1 unit in the WUI index. These findings are comparable to those of Tsui et al. (2018), who used the EPU to assess the effect of risk and uncertainty on business travel to New Zealand. Both studies found risk and uncertainty impact negatively impact business travelers and while income is insignificant. However, while business traveler to Australia is subject to habit persistence, those to New Zealand are not.

As far as VFR travellers are concerned, an increase of 1 unit in the WUI will reduce demand by only 7.41%, considerably less than the other two categories. This finding supports the suggestions by Backer (2012), who states that the VFR market is more resilient because they have a special relationship with the destination through their hosts. According to Forsyth et al. (2012), the traveller's financial commitment to this market segment is smaller as they stay with friends and families. They are also less flexible because they may be travelling to attending family events such as weddings, birthdays and funerals and the need to meet family members and friends is strong. VFR travellers may be less affected by such a crisis because they receive a priori information on the destination from their friends and relatives and are less vulnerable to the media's negative portrayal. This evidence provides in the current study explains that this market is more resilient than the holiday and business segments. It is the reason why Backer and Ritchie (2017) considered the potential of this market segment in post-crisis recovery at affected destinations.

Interestingly, however, arrivals for other sources such as conventions, education, and employment are not affected by increasing uncertainty. Travellers who have financially committed to attend a conference or convention may not be willing or able to cancel their trip without incurring financial penalties. As the next section will show, regarding employment and education, because the duration of stay associated with these two markets is generally longer, the effect of uncertainty, if perceived as short-lived, will not lead to a postponement of their travel, especially that the start date of their employment or education may be fixed.

Regarding the control variables, a country's per capita income is essential in explaining tourists' arrival from thirteen countries to Australia for purposes such as conference, family, employment, and education. Changes in the exchange rate will have a negative and significant

effect on visitors who travel to Australia for holidays, employment, and other purposes. Appreciation of the Australian Dollar causes the cost of expenditure items in Australia to go up. The findings in this study point out that holidaymakers and those travelling for employment and other purposes are responsive to these higher costs.

Table 4 provides the results on length of stay. Here, the WUI impact on the length of stay is negative but significant only for short-term trips, i.e., less than one month, and it is highest for the shortest trip under one week (-0.133). The evidence provided implies that an increase in uncertainty reduces the visits to Australia of a duration of up to one week by 12.5% and that of up to one month by 8.7%. This evidence corroborates the previous findings as the shorter visits to Australia of up to one month are generally associated with Business, VFR, and holidaymakers affected by uncertainty. According to Tourism Australia (2019b), the Business, VFR and holiday travellers spend on average 8, 17 and 9 nights in Australia, respectively, while those travelling for education purposes stay on average for 121 nights. Short-term visitors are more likely to reconsider their visits to Australia in periods of uncertain economic conditions.

INSERT TABLE 4 HERE

As for the control variables, a positive and significant effect is obtained for income, which signifies that increases in a home country's income will increase Australia's arrival for all durations of stay. The exchange rate coefficient is negative and significant for lengths of stay between two weeks and three months, implying that as exchange rates rise, the number of visits for these durations or longer falls. Fluctuations in the exchange rate do not affect travel for less than one week. It means that for such short visits, an appreciation of the exchange rate while increasing the cost of travel does not increase the total cost for a week sufficiently to deter travel. Over the longer period, however, the exchange rate does have a bearing on demand. The number of arrivals for a duration of one week to up to 3 months is negatively affected by increases in the Australian dollar value.

4.2. LSDVC Estimations

The robustness of the findings is verified by estimating Equations 1 using the LSDVC technique. Table 5 reports the LSDVC estimates for tourist arrivals based on the purpose of stay.

INSERT TABLE 5 HERE

The coefficient of WUI is similar to that obtained in the fixed effects estimates as it is harmful and significant for three travel purposes: business, visiting friends/family, and holidays. This evidence confirms that visitors who travel for business, family, and holidays are more sensitive to uncertainties, reflecting their reluctance to visit the country at periods of increased uncertainty. The results for per capita income in the LSDVC estimator differ slightly from that of the Fixed-effects estimates. Per capita income is significant for more categories of the purpose of staying. Under the LSDVC, per capita income is positive and significant for all other purposes of stay except for business and holidays. This evidence means that the per capita income of visitor's countries does not significantly determine their stay in Australia for business or holiday. However, a higher per capita income will strengthen a visitor's decision to stay for conferences, VFR, employment, education, and other purposes. Changes in the exchange rate will negatively affect visitors who travel to Australia for holidays, family, employment, and other purposes confirming the previous results.

Table 6 shows the WUI impact on the length of stay and confirms findings obtained using the fixed-effects technique. The WUI negatively impacts the visit of durations of up to one month and has no significant effect for longer than one month. For the next part of the analysis, the effect on the individual source market is analysed.

INSERT TABLE 6 HERE

4.3 DCCE Estimations

Table 7 reports the DCCE estimations for tourist arrivals to Australia from 13 markets considered. It is starting with the whole panel; it is seen that all variables are significant in explaining variations in the total arrivals. For instance, the WUI shows a negative relationship which signifies that a rise in uncertainty will reduce tourist visits to Australia and GDP per capita has a positive influence on the number of tourists that visit Australia. In contrast, appreciation of the exchange rate is detrimental to international arrivals.

INSERT TABLE 7 HERE

Regarding individual countries, it is seen that the coefficient for the WUI is negative but significant only for ten countries out of 13 countries. These are China, Hong Kong, India, Indonesia, Japan, Malaysia, New Zealand, Singapore, the United Kingdom, and the United States of America and insignificant for Canada, Germany, and South Korea. The effect is lowest for the UK and highest from the USA despite both sources being long haul markets. A significant proportion of the British market is made up of VFR travellers. Because of strong historical and cultural links between the UK and Australia, which is reinforced by the high proportion of Australian residents born in the UK and second-generation migrants, this market is largely dominated by VFR travel.

Moreover, the destination ranks high on British travelers' priority. They consider trips to Australia more of a necessity than a luxury, making the UK a strong and resilient market for this destination. The most vulnerable market is the USA. Australia is a long-haul destination for travellers from the USA, and while it is an important market for Australia, the latter is not a main destination for the USA. An increase in uncertainty, therefore, leads to a higher response in this market. A 1 unit increase in the WDI will lead to a fall in international arrival of 6.3% and 47.8% from the UK and USA, respectively.

Comparing the findings to this study with those in Ghosh (2019), it is observed that both studies find that Chinese travelers to Australia are positively affected by increases in their income but respond negatively to increases in uncertainty and prices level. The magnitude of the effect, however, differs. The current study finds that Chinese travellers are more responsive to changes in income, while in Ghosh(2019), the elasticities related to uncertainties are higher.

5. Conclusion

This paper aims to analyse the effect of global uncertainty on tourism demand to Australia using data from 13 markets. This study departs from similar studies by adopting the World Uncertainty Index (WUI) that harmonises significant uncertainties on political and economic decisions, unlike previous studies that use Geopolitical Risk (GPR) and the Economic Policy Uncertainty (EPU). Apart from using a large panel of international arrivals from Australia's key markets, this study provides insights into how global tourism responds to changes in both global political and economic conditions. The current pandemic that the world is facing is

unprecedented and has tremendously affected the tourism industry because of demand and supply factors. On the supply side, barriers to travel at home and host countries and changes in the market, such as fewer flights, meaning that consumers cannot travel at their convenience. On the demand side, consumers may not be able or willing to travel because of health risks, constantly changing global policies to international and uncertainties regarding income and employment. The literature on tourism demand points out that travelers often display risk adversity characteristics by postponing their trip when faced with uncertainty. According to Walters et al. (2014), understanding consumers is fundamental in developing recovery strategies and making tourism more resilient. However, not much information is available regarding the different market segments and their reactions to changes in uncertainty levels. This issue is a gap that the current attempts to fills. The findings here have the potential for assisting the Australian tourism industry in its post-pandemic recovery phase when uncertainties surrounding the global economic crisis that is enfolding will continue to prevail. It analysed the different market segments and the effect of uncertainty on the duration of stay.

The findings indicate that the Business, Holiday, and VFR markets are affected by uncertainty and different degrees. The VFR market is least affected, and holidays are most affected. Because these three categories of travellers also visit the country for a shorter period, a stay of up to one month is most affected by uncertainty while longer stays are not. In the short run, the early recovery period recommends that authorities devise marketing strategies to target the VFR market. Another interesting result is that the short-term arrivals for conference/events, work and education are not impacted by uncertainties.

Further promotion of this market is likely benefitting the Australian economy. However, it will not bring any solace to short-term accommodation providers who do not cater to this market. Creating a strong link with the sector and the accommodation providers will build some resilience in the business.

This research is not without limitations. The Least Squares Dummy Variable Corrected (LSDVC) estimations are applied to control the address potential problems of endogeneity and reverse causality. The mean regression methodology may fail to capture potential heterogeneous impacts, non-linearities. However, the paper aims not to investigate the influence of regressors on tourism demand across different quantiles. Still, the method of panel quantile regression could be interesting for future research. Finally, the paper did not investigate asymmetric responses. Elasticities concerning increases in uncertainty may differ from elasticities concerning decreases in the index proposed by Ghosh (2019).

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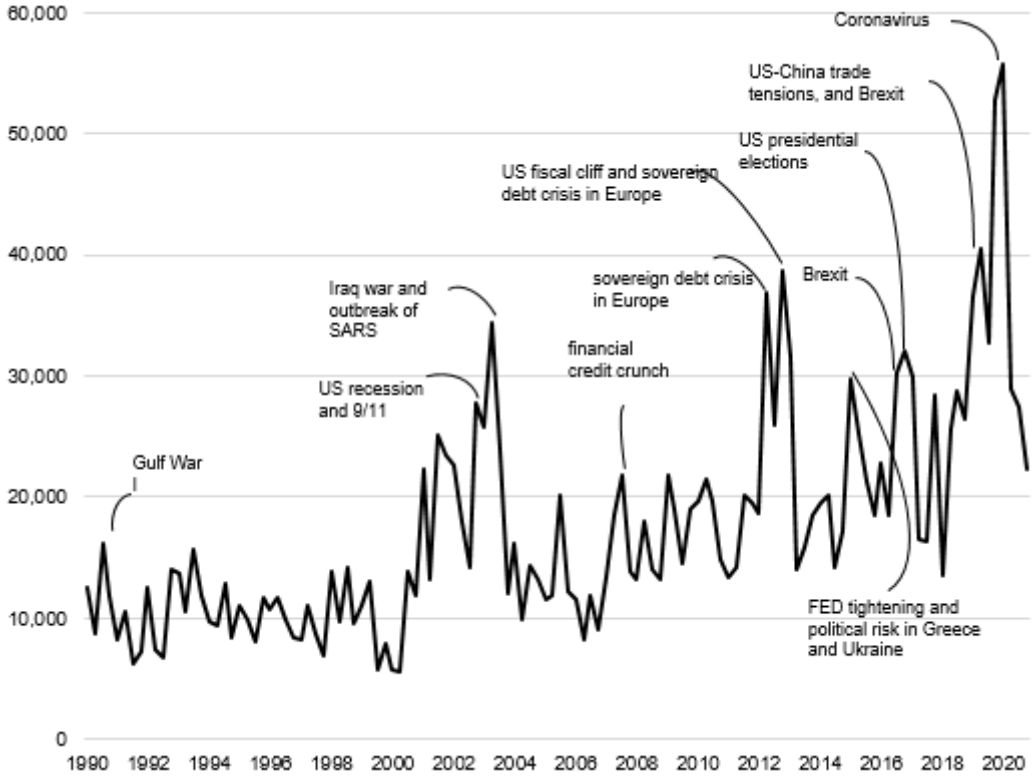
Figure 1. World Uncertainty Index (1990Q1-2020Q4)



Source Ahir et al. (2018)

Table 1
Summary of the Descriptive Statistics

Variables	Definition	Data Source	Mean	Standard Deviation	Minimum	Maximum	Observations
Total Number of Tourist Arrivals	Logarithmic Form	Australian Bureau of Statistics (2020)	12.24	1.448	5.438	14.24	286
Purpose of Stay: Convention/Conference/Exhibition	Logarithmic Form	Australian Bureau of Statistics (2020)	8.696	1.167	2.995	10.94	286
Purpose of Stay: Business	Logarithmic Form	Australian Bureau of Statistics (2020)	9.896	1.230	4.941	12.01	286
Purpose of Stay: Visiting Friends/Relatives	Logarithmic Form	Australian Bureau of Statistics (2020)	10.64	1.280	5.669	13.09	286
Purpose of Stay: Holiday	Logarithmic Form	Australian Bureau of Statistics (2020)	10.44	1.634	5.768	13.49	286
Purpose of Stay: Employment	Logarithmic Form	Australian Bureau of Statistics (2020)	8.168	1.386	4.955	12.29	286
Purpose of Stay: Education	Logarithmic Form	Australian Bureau of Statistics (2020)	10.06	2.260	0.000	13.68	286
Purpose of Stay: Other/Not Stated	Logarithmic Form	Australian Bureau of Statistics (2020)	9.431	0.976	6.131	11.73	286
Length of Stay: Under 1 Week	Logarithmic Form	Australian Bureau of Statistics (2020)	11.06	1.120	8.267	13.42	286
Length of Stay: 1 Week-2 Week	Logarithmic Form	Australian Bureau of Statistics (2020)	11.05	1.116	7.549	13.23	286
Length of Stay: 2 Weeks-1 Month	Logarithmic Form	Australian Bureau of Statistics (2020)	10.58	1.118	7.047	12.60	286
Length of Stay: 1 Month-2 Months	Logarithmic Form	Australian Bureau of Statistics (2020)	9.661	1.005	6.565	11.77	286
Length of Stay: 2 Months-3 Months	Logarithmic Form	Australian Bureau of Statistics (2020)	8.756	0.901	5.393	11.06	286
Length of Stay: 3 Months-6 Months	Logarithmic Form	Australian Bureau of Statistics (2020)	9.161	1.055	4.605	11.85	286
Length of Stay: 6 Months-12 Months	Logarithmic Form	Australian Bureau of Statistics (2020)	9.409	0.914	5.886	11.95	286
World Uncertainty Index	Change	IMF, Ahir et al. (2018)	0.001	0.120	–0.510	0.508	273
Real GDP per Capita (Constant 2010 USD Prices)	Logarithmic Form	World Bank (2020)	27.72	1.452	25.32	30.48	286
Exchange Rate (Foreign Currency per AUD)	Logarithmic Form	St. Louis FED (2020)	2.084	2.898	–1.024	9.278	283
Population	Logarithmic Form	World Bank (2020)	17.99	1.817	15.11	21.04	286
Inflation Rate	Percentage	World Bank (2020)	2.855	4.349	–4.009	58.45	286
Trade Openness	Percentage	World Bank (2020)	107.8	112.5	18.34	442.6	286
Index of Overall Globalisation	Index from 0 to 100	KOF, Dreher (2006), Gygli et al. (2019)	73.91	10.70	42.31	89.35	286
Index of Democracy	Index from 0 to 10	Polity IV Annual Time–Series of Marshall et al. (2019)	6.961	3.873	0.000	10.00	286
Index of Executive Constraints Concept	Index from 1 to 7	Polity IV Annual Time–Series of Marshall et al. (2019)	5.702	1.702	2.000	7.000	286
Index of Polity2	Index from -10 to 10	Polity IV Annual Time–Series of Marshall et al. (2019)	5.430	6.424	–7.000	10.00	286

Table 2
Fixed-Effects Estimations: Number of Total Tourist Arrivals (1996–2017)

Regressors	I	II	III	IV	V	VI	VII	VIII	IX
Δ World Uncertainty Index	–0.152*** (0.055)	–0.183** (0.066)	–0.186** (0.066)	–0.183** (0.064)	–0.183** (0.065)	–0.190** (0.073)	–0.170** (0.063)	–0.180** (0.069)	–0.166** (0.062)
Log Real GDP per Capita	–	0.328*** (0.096)	0.300*** (0.135)	0.327*** (0.099)	0.328*** (0.096)	0.237** (0.091)	0.336*** (0.092)	0.330*** (0.094)	0.333*** (0.088)
Log Exchange Rate	–	–0.462* (0.252)	–0.476* (0.255)	–0.460 (0.296)	–0.485 (0.310)	–0.506 (0.322)	–0.414 (0.258)	–0.450 (0.288)	–0.396 (0.250)
Log Population	–	–	0.153 (0.231)	–	–	–	–	–	–
Inflation Rate	–	–	–	–0.033 (0.368)	–	–	–	–	–
Trade Openness	–	–	–	–	0.050 (0.084)	–	–	–	–
Log Overall Globalization	–	–	–	–	–	0.572 (0.610)	–	–	–
Index of Democracy	–	–	–	–	–	–	–0.036 (0.020)	–	–
Index of Executive Constraints Concept	–	–	–	–	–	–	–	–0.017 (0.040)	–
Index of Polity2	–	–	–	–	–	–	–	–	–0.027** (0.010)
Constant	1.268*** (0.181)	–0.593 (0.943)	–3.053 (3.770)	–0.592 (0.939)	–0.567 (0.970)	–2.008 (1.483)	–0.396 (0.961)	–0.504 (0.934)	–0.472 (0.928)
Observations	273	271	271	271	271	271	271	271	271
Number of Countries	13	13	13	13	13	13	13	13	13
Hausman Test	13.8***	12.7***	11.9***	10.3***	11.4***	12.2***	13.1***	12.1***	11.3***
R–squared (Within)	0.809	0.816	0.816	0.816	0.816	0.817	0.817	0.816	0.818

Notes: The dependent variable is the total number of tourist arrivals in logarithmic form. The robust standard errors clustered at the country level are in the parentheses. *** p<0.01, ** p<0.05, and * p<0.10.

Table 3
Fixed-Effects Estimations: Number of Tourist Arrivals, Purpose of Stay (1996–2017)

Regressors	Convention/Conference/Exhibition	Business	Visiting Friends/Relatives	Holiday	Employment	Education	Other/Not Stated
Δ World Uncertainty Index	–0.012 (0.053)	–0.210*** (0.054)	–0.077* (0.035)	–0.455** (0.205)	–0.031 (0.090)	–0.228 (0.472)	–0.129 (0.121)
Log Real GDP per Capita	0.312*** (0.095)	0.037 (0.039)	0.269*** (0.064)	0.308 (0.198)	0.544*** (0.156)	0.619*** (0.191)	0.017 (0.096)
Log Exchange Rate	–0.248 (0.199)	–0.138 (0.168)	–0.161 (0.174)	–0.798** (0.284)	–0.182** (0.083)	–0.399 (0.473)	–0.619*** (0.181)
Constant	–0.850 (0.848)	0.984** (0.427)	–1.284** (0.476)	6.565** (2.749)	–3.471** (1.302)	–3.861** (1.522)	3.933** (1.656)
Observations	271	271	271	271	271	271	271
Number of Countries	13	13	13	13	13	13	13
Hausman Test	12.0***	13.7***	11.5***	12.0***	13.4***	12.9***	11.7***
R–squared (Within)	0.729	0.828	0.878	0.792	0.940	0.815	0.725

Notes: The dependent variables are the number of tourist arrivals according to the purpose of stay in logarithmic form. The robust standard errors clustered at the country level are in the parentheses. *** p<0.01, ** p<0.05, and * p<0.10.

Table 4
Fixed-Effects Estimations: Number of Tourist Arrivals, Length of Stay (1996–2017)

Regressors	Under 1 Week	1 Week-2 Weeks	2 Weeks-1 Month	1 Month-2 Months	2 Months-3 Months	3 Months-6 Months	6 Months-12 Months
Δ World Uncertainty Index	–0.133** (0.054)	–0.091** (0.041)	–0.091** (0.035)	–0.031 (0.068)	–0.056 (0.050)	–0.024 (0.045)	–0.092 (0.087)
Log Real GDP per Capita	0.478* (0.231)	0.289*** (0.061)	0.268*** (0.051)	0.232*** (0.029)	0.285*** (0.042)	0.346*** (0.041)	0.167** (0.057)
Log Exchange Rate	–0.022 (0.129)	–0.309** (0.137)	–0.285** (0.124)	–0.187* (0.089)	–0.260* (0.121)	–0.307 (0.176)	–0.256 (0.153)
Constant	–1.706 (1.273)	–0.506 (0.515)	–0.844 (0.519)	1.050** (0.347)	–1.172** (0.521)	–1.369** (0.519)	–0.083 (0.491)
Observations	271	271	271	271	271	271	271
Number of Countries	13	13	13	13	13	13	13
Hausman Test	13.3***	12.8***	12.5***	11.5***	12.6***	13.4***	12.5***
R–squared (Within)	0.848	0.827	0.869	0.903	0.849	0.838	0.875

Notes: The dependent variables are the number of tourist arrivals according to the length of stay in logarithmic form. The robust standard errors clustered at the country level are in the parentheses. *** p<0.01, ** p<0.05, and * p<0.10.

Table 5
LSDVC Estimations: Number of Tourist Arrivals, Purpose of Stay (1996–2017)

Regressors	Total	Convention/Conference/Exhibition	Business	Visiting Friends/Relatives	Holiday	Employment	Education	Other/Not Stated
Δ World Uncertainty Index	–0.183** (0.090)	–0.013 (0.042)	–0.210*** (0.046)	–0.084*** (0.027)	–0.469*** (0.152)	–0.044 (0.072)	–0.251 (0.382)	–0.139 (0.151)
Log Real GDP per Capita	0.328*** (0.050)	0.294*** (0.034)	0.035 (0.138)	0.326*** (0.134)	0.052 (0.126)	0.131** (0.063)	0.259*** (0.035)	0.495*** (0.140)
Log Exchange Rate	–0.460*** (0.172)	–0.241 (0.389)	–0.136 (0.146)	–0.286** (0.114)	–0.644** (0.285)	–0.263** (0.122)	–0.269 (0.318)	–0.558*** (0.135)
Observations	271	271	271	271	271	271	271	271
Number of Countries	13	13	13	13	13	13	13	13

Notes: The dependent variable is the number of tourist arrivals according to the purpose of stay in logarithmic form. The robust standard errors clustered at the country level are in the parentheses. *** p<0.01, ** p<0.05, and * p<0.10.

Table 6
LSDVC Estimations: Number of Tourist Arrivals, Length of Stay (1996–2017)

Regressors	Under 1 Week	1 Week-2 Weeks	2 Weeks-1 Month	1 Month-2 Months	2 Months-3 Months	3 Months-6 Months	6 Months-12 Months
Δ World Uncertainty Index	–0.134*** (0.019)	–0.056** (0.021)	–0.091** (0.041)	–0.031 (0.021)	–0.056 (0.105)	–0.023 (0.120)	–0.093 (0.201)
Log Real GDP per Capita	0.432** (0.181)	0.288** (0.138)	0.178* (0.096)	0.236* (0.121)	0.226** (0.107)	0.234* (0.136)	0.095 (0.083)
Log Exchange Rate	–0.120 (0.164)	–0.310*** (0.145)	–0.231*** (0.083)	–0.197* (0.106)	–0.354*** (0.096)	–0.238** (0.112)	–0.229** (0.103)
Observations	271	271	271	271	271	271	271
Number of Countries	13	13	13	13	13	13	13

Notes: The dependent variable is the number of tourist arrivals according to the length of stay in logarithmic form. The robust standard errors clustered at the country level are in the parentheses. *** p<0.01, ** p<0.05, and * p<0.10.

Table 7
DCCE Estimations: Number of Total Tourist Arrivals (1996–2017)

Country	Log GDP Per Capita	Log Exchange Rate	World Uncertainty Index	Error Correction Term
Panel	0.481* (0.248)	–0.133** (0.067)	–0.106* (0.047)	–
Canada	1.124*** (0.407)	–0.309 (0.208)	–0.070 (0.101)	0.749*** [6.21]
China	0.614** (0.242)	–0.135* (0.077)	–0.107** (0.051)	0.901*** [5.95]
Germany	1.199*** (0.296)	–0.344*** (0.115)	–0.029 (0.066)	0.705*** [4.11]
Hong Kong	0.852*** (0.160)	–0.338* (0.174)	–0.171*** (0.067)	0.880*** [5.01]
India	1.433*** (0.316)	–0.216* (0.125)	–0.550** (0.278)	0.502*** [3.34]
Indonesia	0.544 (0.413)	–4.333* (2.091)	–0.496** (0.247)	0.564*** [3.09]
Japan	1.955** (0.844)	–0.600** (0.239)	–0.312*** (0.091)	0.995*** [10.7]
Korea Republic	1.687*** (0.207)	–1.097*** (0.240)	–0.210 (0.211)	0.145*** [2.98]
Malaysia	1.232*** (0.329)	–0.442** (0.215)	–0.224** (0.095)	0.706*** [4.80]
New Zealand	1.336*** (0.439)	–0.238 (0.207)	–0.253** (0.125)	0.477** [2.16]
Singapore	0.700*** (0.174)	–0.744*** (0.241)	–0.281** (0.142)	0.584*** [3.19]
United Kingdom	0.773*** (0.256)	–0.156*** (0.053)	–0.065* (0.035)	0.605*** [4.98]
United States	0.631** (0.261)	–0.142* (0.077)	–0.651*** (0.112)	0.996*** [5.84]

Notes: The dependent variable is the total number of tourist arrivals in logarithmic form. The optimal number of lag length is selected by the Akaike Information Criteria. Figures in brackets and parentheses indicate the t-statistics and the standard errors, respectively. *** p<0.01, ** p<0.05, and * p<0.10.