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RESEARCH LETTER

Modeling tourism and fear nexus in G4 countries

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ABSTRACT

In this paper, we examine whether there is a causal relationship between migration-related fear and tourism. To achieve the objective, a lag-augmented vector autoregressive (LA-VAR) model that generates country-specific causality test results is employed. The period covered extends from 1995Q1 to 2016Q4. To control for omitted variable bias, we include real gross domestic product per capita as an additional variable. Empirical results provide evidence of one-way causality running from migration-related fear to tourism, and neutrality hypothesis is confirmed in the relationship between migration-related fear and economic growth, and between tourism and economic growth. Although the study confirms the fear-induced tourism hypothesis, it however further submits that other determinants such as exchange rates and real gross domestic product are much more important than fear in determining the number of arrivals at a destination.

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Fear; tourism arrivals; economic growth; panel data; G4 countries

1. Introduction

Tourism is known to positively impact employment, investment and other economic activities, especially in the wake of increasing global integration pathways (World Travel and Tourism Council [WTTC], 2018). Adverse effects such as overtourism, environmental degradation and security threats have however been recorded in the tourism industry over the past decades. Considering that one of the world's most devastating terrorist attacks happened on 11 September 2001 (9/11) in the United States, Araña and León (2008) investigated the short-run impact of the attacks on tourist preference for destinations in the Mediterranean and the Canary Islands. The study revealed that the attacks had a strongly negative impact on the tourism profile of New York but increased the attractiveness of the Mediterranean and Canary Islands as tourist destinations.

Over and above the already established link between tourism and various economic indicators (see Alola & Alola, 2018a, 2018b; Akadiri et al., 2019; Fahimi et al., 2018; Roudi, Arasli & Akadiri, 2019; Saint Akadiri et al., 2019; Wan & Song, 2018), the impact of non-economic indicators such as terrorism, insecurity and regional tension (see Alola, Alola, et al., 2019; Alola, Cop, et al., 2019; Bassil et al., 2019; Perles-Ribes et al., 2018; Wachowiak, 2016) are increasingly being linked with tourism. Evidently, most of these aforementioned determinants of tourism demands influence the decision-making process of potential tourists. Other studies that have examined the critical impact of terrorism, crime, corruption and political instability on tourism demand – and to some extent, supply – include Saha and Yap (2014), and Fourie et al. (2019).

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The novelty of this study is thus centred on the objective of examining whether a causal relationship exists between migration-related fear and tourism arrivals. To do so, the newly developed quantitative fear indices for all four countries (France, Germany, the United Kingdom, and the United States) are employed. Being the first to examine the link between the concept of fear and tourist arrivals, this study highlights the importance of addressing country-specific factors that induce fear. It also provides the causal nexus between migration-related fear and economic performance, since France, Germany and the United Kingdom are Europe's largest economy by Gross Domestic Product (GDP) and the United States is also the world's largest economy by GDP.

2. Methodology

As it is well known in existing literature, according to the standard asymptotic theory, hypothesis testing in level-VAR is not valid if the underlying data series are integrated of either order 1 or 2, i.e. $I(1)$ or $I(2)$ (Sims, Stock & Watson, 1990; Toda & Phillips, 1993). To overcome this problem, Toda and Yamamoto (1995) proposed an alternative method to test coefficient restrictions in the level-VAR model. This method is based on the modified Wald test in LA-VAR with asymptotic chi-square (χ) distribution for the estimated VAR (p + dmax) model. An extension of the LA-VAR method was introduced by Emirmahmutoglu and Kose (2011) to test for causality in heterogeneous mixed panels.

$$y_{i,t} = \varphi_i^y + \sum_{m=1}^{k_i+dmax_i} B_{11,im} z_{i,t-m} + \sum_{m=1}^{k_i+dmax_i} B_{12,im} y_{i,t-m} + u_{i,t}^y \tag{1}$$

$$z_{i,t} = \varphi_i^z + \sum_{m=1}^{k_i+dmax_i} B_{21,im} z_{i,t-m} + \sum_{m=1}^{k_i+dmax_i} B_{22,im} y_{i,t-m} + u_{i,t}^z \tag{2}$$

Where the indices t and i represent time period and individual cross-sectional units respectively. The lag structure is represented by k_i while $dmax_i$ denotes the maximal order of integration. In this study, $y_{i,t}$, $i = 1,2, \ldots N$ refers to *TA,* while $z_{i,t}$, $i = 1,2, \ldots N$ refers to *RGDP* and *FEAR*.

3. Data description and estimation

3.1. Data

For all four countries, we examine causal relations among migration-related fear index (FEAR), the real GDP (RGDP), a weighted exchange rate (WEXR) and international tourist arrivals (TA). The migration-related fear index was developed by Baker et al. (2016) from newspaper captions containing anxiety, panic, bomb, fear, crime, terror, worry, concern and violence, and it is available for further reading at http://www.policyuncertainty.com/immigration_fear.html By using the consumer price index (CPI) for each country and bilateral exchange rate (ER) between the US dollar and Euro, WEXR is calculated based on substitute prices. TA, CPI, ER, and RGDP are obtained from the 2019 Eurostat database of the European Commission, available at https://ec.europa.eu/eurostat/data/statistics-a-z/abc. Since TA and RGDP indicators are highly seasonal, both indicators are seasonally adjusted using the Census X-12 method.

4. Results and discussion

Before performing the country-specific causality tests, we checked for the presence of cross-sectional dependence (CSD) among the G4 countries. We further tested for slope homogeneity test. As reported in Table 1, we could not reject the null of CSD at $p < 0.01$ significance level for all the variables.

Table 1. Cross-sectional dependence and homogeneity test results.

	Statistics (*p*-value)		
CSD Tests.	*Lnfear*	*Lnrgdp*	*Wexr*
LM (Breusch & Pagan, 1980)	76.902*	245.142*	132.567*
	(0.000)	(0.000)	(0.000)
CDlm (Pesaran, 2004)	20.468*	69.034*	36.537*
	(0.000)	(0.000)	(0.000)
CD (Pesaran, 2004)	−6.865*	−6.776*	−7.106*
	(0.000)	(0.000)	(0.000)
LMadj (Pesaran, Ullah, & Yamagata, 2008)	25.934*	65.982*	1.026
	(0.000)	(0.000)	(0.153)
Slope homogeneity tests			
$\hat{\Delta}$	71.744*	−2.000	−22.447*
	(0.000)	(0.977)	(0.000)
$\hat{\Delta}_{adj}$	72.999*	−2.047	−22.975*
	(0.00)	(0.980)	(0.000)

Note: *denotes a significance level of 0.01.

We could however reject the null of slope homogeneity at $p < 0.01$ significance level for lnrgdp. We then tested for the stationarity properties of the series using CIPS unit root test. Table 2 reports the CIPS unit root test results. We also checked for the presence of a long-term relationship between the series using the cointegration test of Westerlund and Edgerton (2007). As reported in Table 3, the results reveal the existence of a long-run relationship among the variables included in the panel time series at $p < 0.01$ significance level.

The causality results, as reported in Table 4, provide evidence against the null of non-causality running from fear to tourism. We find a one-way causality running from fear to tourism in France, Germany, the United Kingdom and the United States at $p < 0.10$ significance level or better. This result confirms that migration-related fear impacts tourism. We thus infer that fear is a significant predictor of tourism activities. It appears that sources of migration-related fear are determining factors when tourists choose destinations to visit. This is consistent with the findings of Wachowiak (2016) and Bassil et al. (2019), and provides a basis for policymakers in each country to capture and control for fear-related attitudes that might cloud tourist perception as well as the prevailing socio-economic, political, security and cultural situations that potentially influence tourists' decisions to embark on a tour.

From the results reported in Table 4, we could not reject the null of non-Granger causality from fear to economic growth, and from economic growth to tourism. These results indicate that fear does not have predictive power over economic growth, and also that economic growth does not predict fear in these countries. Neutrality hypothesis is confirmed in the relationship between economic growth and tourism for the sampled countries. In addition, based on the results, we opine that the real effective exchange rate plays a significant role in tourists' decision-making regarding destinations to visit. These results suggest that in these countries, tourist arrivals are not output-driven, and economic growth is not tourism-dependent. The sampled countries are industrialized nations

Table 2. CIPS unit root test.

	Level			First Difference		
Series	*lnta*	*lnfear*	*lnrgdpwexr*	*Δlnta*	*Δlnfear*	*Δlnrgdp Δwexr*
Statistics	−2.059	−2.962**	−1.309 −5.178*	−5.591*	−6.190*	−5.212* −8.748*

Notes: (i) Case III critical values for CIPS statistics are −3.05, −2.79 and −2.66 for 0.01, 0.05 and 0.10 respectively. (ii) * and ** denote significance levels of 0.01 and 0.05 respectively.

Table 3. Cointegration test.

Tests	g_tau	g_alpha	*p*_tau	g_alpha
Statistic (*p*-value)	−5.689 (0.000)	−5.576 (0.001)	−5.636 (0.000)	−5.636 (0.000)

Table 4. Emirmahmutoglu and Kose (2011) Granger causality test.

	lnta does not Granger cause lnfear			lnfear does not Granger cause lnta		lnrgdp does not Granger cause lnfear			lnfear does not Granger cause lnrgdp		lnrgdp does not Granger cause lnta			lnta does not Granger cause lnrgdp	
	Lags	Wald statistics	*P*-value	Wald statistics	*P*-value	Lags	Wald statistics	*P*-value	Wald statistics	*P*-value	Lags	Wald statistics	*P*-value	Wald statistics	*P*-value
France	1	0.146	0.703	5.221**	0.022	2	0.374	0.830	36.451*	0.000	1	0.037	0.847	0.455	0.500
Germany	1	0.879	0.349	5.033**	0.025	2	3.396	0.183	22.954*	0.000	1	0.064	0.800	0.473	0.491
UK	2	0.381	0.827	5.593***	0.061	2	4.856***	0.088	21.871*	0.000	1	0.069	0.793	0.563	0.453
US	2	0.585	0.746	8.018**	0.018	3	1.381	0.710	30.970*	0.000	1	0.118	0.731	0.461	0.497
Λ		3.779	0.876	28.603*	0.000		9.311	0.317	109.203*	0.000		1.870	0.985	5.789	0.671

	lnta does not Granger cause wexr			wexr does not Granger cause lnta		lnrgdp does not Granger cause wexr			wexr does not Granger cause lnrgdp		lnfear does not Granger cause wexr			wexr does not Granger cause lnfear	
	Lags	Wald statistics	*P*-value	Wald statistics	*P*-value	Lags	Wald statistics	*P*-value	Wald statistics	*P*-value	Lags	Wald statistics	*P*-value	Wald statistics	*P*-value
France	1	2.207	0.137	1.232	0.267	1	0.921	0.337	0.262	0.609	3	0.676	0.879	20.793*	0.000
Germany	1	1.264	0.261	0.654	0.419	1	3.655**	0.056	1.739	0.187	1	0.346	0.556	1.664	0.197
UK	1	0.268	0.604	0.251	0.616	1	0.136	0.712	0.387	0.534	2	2.656	0.265	4.150	0.126
US	1	2.957*	0.086	0.932	0.334	1	1.983	0.159	1.496	0.221	3	9.935**	0.019	1.266	0.737
Λ		12.583	0.127	7.541	0.480		12.298	0.138	8.614	0.376		12.000	0.151	26.127*	0.001

Notes: (1) ***, ** and * represent significance at 0.10, 0.05 and 0.01 significance levels. (2) Lag orders are selected by minimizing the Schwarz information criteria. (3) Λ denotes Fisher test statistic.

that do not depend on tourism for economic growth and development, unlike small islands and large tourism states (see Akadiri et al., 2019; Roudi *et al.,* 2019).

To augment the causality results, we also carried out a regression analysis via the Pooled Mean Group (PMG) ARDL technique which produces short- and long-run estimates and assume homogeneity among the sampled G4 countries.[1] As reported in appendix A1, results show that past/present migration-related fear impacts on tourist arrivals and destinations. Doubling past and present migration-related fears and occurrences would decrease visits to such tourist destinations by 0.02% and 0.003% in the short run at $p < 0.05$ significance level. Furthermore, we find the effects of migration-related anxiety to be insignificant on tourist arrivals in the long run.

5. Conclusion

In this paper, we tested for causal relations between migration-related fear and tourism in France, Germany, the United Kingdom and the United States over the period 1996Q1-2017Q4, using a LA-VAR approach advanced by Emirmahmutoglu and Kose (2011) which produces country-specific causality results. From a policy viewpoint, we suggest that governments and policymakers of the sampled countries and other tourist destinations of the world apply more sector-specific policies. For instance, a specific socio-economic policy that is targeted at exchange rates would be more effective than an integrated policy that addresses political or cultural issues and exchange rates at the same time. Also, marketing policies or strategies such as the re-branding of the tourism industry would make it more attractive and positively influence tourists' decisions. Concerted efforts should as well be geared towards reducing insecurity, political instability and other factors that smear destination profiles. This would minimize the perceived risk and fear exhibited toward the tourist destinations.

Note

1. See appendix A1 and B1 for PMG results.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Appendix

Table A1. Pooled Mean Group estimates of the ARDL (3,1,1,1) model with WEXR.

Regressors	Coefficient	t-stat	*p*-Value
Adjustment Coefficients	−0.051***	−1.701	0.089
Short-run Coefficients			
Δlnta (−1)	0.057	0.451	0.652
Δlnta (−2)	−0.292	−1.301	0.194
Δlnfear	−0.012	−1.390	0.165
Δlnrgdp	1.084	1.393	0.164
Δwexr	0.001	1.586	0.114
Constant	0.294	1.573	0.112
Long-run Coefficients			
Lnrfear	−0.016	−0.504	0.614
Lnrgdp	1.006*	3.398	0.001
Lnwexr	−0.031**	−2.168	0.030
No of Countries	4		
No of Observations	340		

Notes: (i) The number of observations drops from 352 to 340 since lags of the tourism arrivals are included as an independent variable in the right side of the model. (ii) ***, ** and * represent 0.10, 0.05 and 0.01 significance levels respectively.

Table B1. Pooled Mean Group estimates of the ARDL (2,2,1) model without WEXR

Regressors	Coefficient	t-stat	*p*-Value
Adjustment Coefficients	−0.058**	−2.252	0.025
Short-run Coefficients			
Δlnta(−1)	0.086	0.608	0.543
Δlnfear	−0.011	−0.922	0.357
Δlnfear(−1)	−0.012***	−1.860	0.063
Δlnrgdp	0.426	0.514	0.607
Constant	0.602**.	2.402	0.016
Long-run Coefficients			
Lnrfear	−0.096	−1.270	0.204
Lnrgdp	0.428	0.687	0.492
No of Countries	4		
No of Observations	360		

Notes: (i) The number of observations drops from 352 to 345 since the first order lag of the tourism arrivals is included as an independent variable in the right side of the model. (ii) ***, ** and * represent 0.10, 0.05 and 0.01 significance levels respectively.