

International Tourism and Bilateral Trade in Fiji: An Empirical Examination of Their Interdependence

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Abstract

This paper examines the relationship between international trade and tourism inflows using time series econometric techniques. Using Data for Fiji and two major trade and tourism partners, Australia and New Zealand, the paper examines this relationship both at aggregate and bilateral levels. The bounds cointegration test reveals a significant long-run relationship between Fiji's trade series and tourism inflows. Granger causality with an error model shows evidence of significant short-run and long-run causality between trade series and tourism inflows. The bilateral analysis shows unidirectional causality from trade to tourism with Australia, while short-run bidirectional (trade and tourism) and long-run unidirectional (trade to tourism) causality in the case of New Zealand. The empirical findings highlight some significant causality patterns that are valuable for policy design to foster international tourism inflows.

Keywords: Australia; Bilateral Trade; Export; Fiji; Import; International Tourism Inflows; New Zealand

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Introduction

International trade and tourism are two main sources of foreign currency for many developing countries. Small developing countries, in particular, island nations, are more reliant on trade and tourism compared to the large developing and advanced industrialised economies. High dependency on agriculture-based exports and tourism, including service exports, reflects distinctive characteristics of island nations and, as such, offers a foundation for a possible comparative advantage (Mehmet & Tahiroglu, 2002). Together with export earnings, tourism receipts are a significant source of foreign exchange that helps offset current account deficits because travel expenditures act as a substitute for exports, improving the balance of payments in many nations (Oh, 2005).

The empirical relationship between international trade, tourism, and economic growth, particularly the trade-led and tourism-led growth hypotheses, has been the subject of numerous studies. However, the same cannot be said for the empirical relationship between international trade and tourism (Gunduz & Hatemi-J, 2005), as the connections between international trade and tourism have not found much application (Shan & Wilson, 2001). Nonetheless, there is recent burgeoning literature on trade and tourism (Khalid et al., 2022; Kumar et al., 2019). The question, therefore, is whether there is a feedback causal relationship between tourist arrivals and foreign trade, or do they exist in tandem? It is contended that the demand for foreign products and services will rise because of increased international tourism, which also boosts export revenue through the country's service account of the balance of payments. Tourism arrivals can also increase the perception of domestic products and services in foreign markets, leading to new trade opportunities, which is another way that international tourism influences global trade (Kulendran & Wilson, 2000; Shan & Wilson, 2001). Conversely, in cases where global commerce promotes international tourism, it may do so through export, import and business travel, which later prompts vacation travel due to increased trade opportunities (Kulendran & Wilson, 2000).

Furthermore, the existing empirical literature on tourism forecasting based on the tourism demand function has also been the subject of many studies (Kumar et al., 2020; Narayan, 2004). However, one aspect of the literature that remains incomplete is the role that global trade plays in influencing travel demand. Business travel has been a significant part of international travel (World Tourism Organisation, 2005; Kulendran & Wilson, 2000), and international travel may encourage more trade opportunities. Therefore, the endogeneity between international trade and tourism has significant implications for predicting tourism inflows; thus, failing to take this into account will lead to an inadequate assessment of the factors that determine the tourist demand. Moreover, the literature also highlights methodological issues in previous studies, making it a debatable issue (Witt & Witt, 1995; Lim, 1997). On the other hand, several studies have integrated recent advances in econometric theory, such as time series cointegration theories and Granger causality-based procedures, into tourism analysis (Song et al., 2003; Kulendran & Wilson, 2000; Luo et al., 2022).

The main objective of this study is to investigate the nature of the causal relationship between international trade and tourism in the Pacific Island nation of Fiji. There are several reasons to take Fiji as a country-level analysis. First, there is the availability of a consistently large data set to undertake empirical analysis. Second, Fiji is one of the world's top tourism-dependent countries (UNWTO, 2022). It received over 0.9 million international tourists (4% more than in 2019) and gross tourism earnings of F\$2,368 million (21.8% of GDP) in 2023 (Reserve Bank of Fiji, 2024). Secondly, Fijian policymakers consider the trade and tourism sector not only to be one of the most

significant sources of foreign exchange but also to underpin significant socio-economic development in the island nation.

The empirical analysis of finding an association between foreign travel and trade flows starts with testing the order in which trade and tourism time series integrate to determine whether related time series pairs have a common random trend. The existence of a long-run equilibrium relationship is suggested by the presence of a common stochastic trend, but this relationship only holds when the residual series from the cointegration equation is stationary. Any evidence of international trade and tourism inflows moving in tandem over time will provide support for the notion that a relationship exists between international trade and tourism inflows. However, cointegration analysis alone cannot determine whether one series causes another². Thus, the dynamic specification of a causation test proposed by Granger (1969, 1988) is applied to examine the direction of the relationship between the two variables.

Furthermore, to provide a robust analysis of tourism and trade, distinct bilateral relationships on international travel and trade are considered. This paper examines the international tourism inflows to Fiji from its two major travel and trade partners: Australia and New Zealand. In 2023, Australia provided 47% of the total tourism inflows to Fiji and New Zealand provided 24%. As regional and bilateral partners, these two countries are also Fiji's very significant trade partners. In 2023, Australia accounted for about 10% of Fiji's total exports and 15.4% of imports. Whereas New Zealand accounted for 5.25% of total exports and 13.65% of imports. Exports and imports in 2019 (before the COVID-19 pandemic) accounted for 12.2% and 14.2% respectively, with Australia and 7% and 12.4%, respectively, with New Zealand. Thus, there is a possibility that there is a relationship between Fiji's tourism and trade with respect to its bilateral partners.

This paper contributes to the existing research in several ways. First, in relation to the empirical analysis, the trade in the model is not only examined as the total volume of trade but also considered in terms of the export and import of goods and services separately, emphasising specific causality direction with tourism. Second, the trade and tourism relationship is examined with respect to bilateral partners. Australia and New Zealand, being the top two tourism as well as trade partners to Fiji, a country-wise analysis is conducted, adding further insight on the causality directions and robust analysis. Third, research on tourism and trade relations in Fiji is virtually absent. While notable contributions to tourism research include Katafono and Gounder (2004), Narayan (2005), Kumar and Kumar (2012), and Jayaraman and Makun (2020), determining the causal association between international travel and international trade is not the main goal of these studies. Thus, this is the first attempt to provide an empirical analysis of the trade and tourism relationship in the context of Fiji, extending the research stream on tourism and trade.

The rest of the paper is arranged as follows. The following section reviews the literature concerning international tourism and trade. The next section presents the data and empirical methodology employed in the analysis. Following this is the results section. The fifth section provides a discussion and implications. Finally, the last section provides a conclusion.

Literature review

Tourism has become a significant part of many countries' economies. A significant amount of

² There isn't instantaneous causation. Due to the time lag, independent reactions are never immediately followed by one another (Charemza & Deadman, 1997).

research on tourism generally focuses on its impact on employment and economic growth in countries or groups of countries (Ivanov & Webster, 2007; Liu & Wall, 2006; Pablo-Romero & Molina, 2013; Du et al., 2016). Similarly, much of the research on bilateral trade flows considers bilateral trade patterns between countries and models factors that influence trade flows (Dutt & Traca, 2010; Wang et al., 2010; Xing, 2018; Pan et al., 2021). There is also research on the factors driving tourism demand. These studies typically look at a number of economic factors such as income, tourism prices, transport costs and exchange rates that are connected to the demand for travel in various countries (Dritsakis, 2004; Song & Li, 2008; Law et al., 2019 and Polyzos et al., 2021). However, it is widely held that open economies with high trade intensities can better facilitate travel and tourism (Santana-Gallego et al., 2011). The trade-tourism literature is burgeoning (Kulendran & Wilson, 2000; Katircioglu, 2009; Kumar et al., 2019) and can be separated into two strands: (i) trade leads to tourism and (ii) tourism leads to trade.

Kulendran and Wilson's (2000) groundbreaking study used time-series econometric techniques, specifically the cointegration and the Granger non-causality approach, to examine how trade and tourism are related. Their study established a causal relationship between trade and tourism with Australia and its four principal trading and tourism partners. Kulendran and Wilson's (2000) analysis and findings lend credence to the theory that business travelers visiting Australia for trade can stimulate global trade. Additionally, they demonstrated a one-way relationship between trade, especially for exports, and holiday visitors. Khan et al. (2005), following the same method, examine this notion in the context of Singapore. According to Khan et al. (2005), Singapore's import and business travel are related. Khan et al. (2005) concluded that there is a country-specific relationship between tourism and trade.

Recent empirical studies also provide evidence of a connection between trade and tourism in a particular country or among nations in a region. For instance, Katircioglu (2009) investigated the causality between tourism, trade and growth in Cyprus. The study shows long-run cointegration between the variables. The causality analysis reveals that income growth stimulates exports and imports, and trade also stimulates international arrivals. Shan and Wilson (2001) provided evidence in the context of China of a causal relationship between foreign trade and tourism. Brau and Pinna (2013) employed the gravity approach in disaggregated data to investigate the impact of foreign arrivals on bilateral exports between 25 European countries between 1998 and 2009. Their estimates show a positive correlation between tourism inflows and exports. According to Brau and Pinna (2013), tourists who have contact with the domestic market in their destination country during their travels may have different perceptions of foreign goods and culture, which could lead to an increase in demand for these goods in international markets. Furthermore, Santana-Gallego et al. (2016) modified the gravity equation to account for the likelihood of a firm becoming an exporter and examined variables related to tourism. He concluded that foreign tourism may enhance the likelihood and volume of a nation's bilateral trade. Çalışkan et al. (2019) also used panel cointegration and Granger causality testing and discovered both short- and long-term relationships in trade and tourism between Turkey and the Silk Road nations. Kumer et al. (2019), using wavelet analysis to capture the time frequency in the trade income and tourism nexus, show that trade intensity increases tourism receipts.

The relationship between specific tourism arrival categories (such as business and leisure travel) and bilateral trade is also the subject of some research. For instance, Aradhyula and Tronstad (2003) found that business travel has a greater impact on cross-border commerce between Mexico and the USA. Furthermore, Poole (2010) looked at the relative contributions of various forms of tourism to

trade facilitation in the USA. Specifically, Poole (2010) measured the contribution of business travel to trade and asserted that business travel can help overcome information barriers that prevent trade relations or new ones from being formed. Similarly, Belenkiy and Riker (2012) provided evidence of the beneficial impact of business travel on US goods exports. Additionally, Tsui and Fung (2016) discovered a unidirectional causality of business travel on mutual trade volumes between Hong Kong and Mainland China, as well as a bidirectional causal link between business travellers from Hong Kong and the United States and their trade flows. More recently, Luo et al. (2022) looked at business and leisure travel as two distinct categories of inbound tourism to China. They show that foreign arrivals are positively linked to trade flows between China and its tourism markets, and the inbound leisure arrivals to China have a significant influence on bilateral trade relative to business arrivals.

Data and Empirical Methodology

Data

The data on international trade and tourism were sourced from the Fiji Bureau of Statistics (FBS). International trade (*Tra*) including exports to overseas and imports to Fiji, was obtained from the Trade Statistics Division of FBS. Export (*Exp*) and import (*Imp*) are measured in actual Fiji dollars (FJD). Total trade volume refers to the combined sum of exports and imports. Tourism arrival numbers (*Tour*) to Fiji from overseas were obtained from the tourism division of FBS. These data comprise a monthly series covering the period 2003M1 to 2019M12, with all required information. The lack of time series for type of travel, limits the analysis of specific types of travel with trade. For bilateral analysis, Australia and New Zealand are the top two bilateral trade and tourism partners, with data specific to these countries sourced from FBS. The summary statistics of the data are reported in Table 1.

Table 1. Summary statistics

Variables	Mean	Maximum	Minimum	Std. Dev.
LTOUR	4.496527	4.983969	2.518514	0.715775
LEXP	5.231866	5.49601	5.040171	0.091658
LIMP	5.62991	5.912665	5.423917	0.104997
LTRA	5.778048	6.010822	5.592891	0.092475

Empirical Methodology

As a first step in empirical analysis, the trend properties of the series are analyzed using Dickey and Fuller (1979) based Augmented Dickey-Fuller (ADF) and Phillips and Perron (1998) based Phillips-Perron methodology. Table 2 provides the ADF and Phillips-Perron unit root test results for the study variables. The ADF results reveal that the variable tourism arrival is integrated into the order of one. However, with PP, the variable appears to be stationary at levels, specifically in models ∂_c and ∂_{ct} . We consider the PP test result to be the most appropriate in this study, as this procedure accounts for autocorrelation in residual analysis. Furthermore, the total trade volume, as well as export and import are stationary at levels using the general model with intercept and trend in both ADF and PP tests. Thus, results imply that these variables are integrated of order zero, $I(0)$, including tourism arrivals.

Table 2. ADF and PP test

Level form test statistics	<i>lnTour</i>	Lag	<i>lnTra</i>	Lag	<i>lnExp</i>	Lag	<i>lnImp</i>	Lag
ADF (∂_c)	-1.868	(1)	-5.966*	(0)	-6.056*	(4)	-6.347*	(0)
ADF (∂_{ct})	-0.088	(1)	-6.356*	(0)	-6.005*	(4)	-6.953*	(0)
ADF (∂)	7.105	(1)	0.663	(1)	-0.010	(9)	0.755	(1)
PP (∂_c)	-3.801*	(4)	-6.069*	(3)	-5.519*	(1)	-6.497*	(3)
PP (∂_{ct})	-4.587*	(4)	-6.481*	(3)	-5.440*	(1)	-7.037*	(2)
PP (∂)	0.312	(4)	1.119	(1)	0.313	(1)	1.093	(12)
Difference (1st) form test statistics								
ADF (∂_c)	-18.663*	(0)	-15.101*	(0)	-6.676*	(8)	-16.350*	(0)
ADF (∂_{ct})	-19.137*	(0)	-15.016*	(0)	-6.621*	(8)	-16.273*	(0)
ADF (∂)	-3.879*	(1)	-15.133*	(0)	-6.752*	(8)	-16.369*	(0)
PP (∂_c)	-9.522*	(4)	-15.535*	(2)	-13.109*	(6)	-16.948*	(2)
PP (∂_{ct})	-9.501*	(4)	-15.455*	(2)	-13.032*	(6)	-16.893*	(2)
PP (∂)	-9.548*	(4)	-15.556*	(2)	-13.210*	(6)	-16.948*	(2)

Notes: Variables are defined as above. Series are tested in log form. ∂_c indicates a test with an intercept; ∂_{ct} is the test with an intercept and trend; ∂ is the restricted test with no intercept and trend. The ADF lag is determined by the SIC. For the PP model, the Newey-West Bandwidth based on the Bartlett-Kernel method is used. * Represents evidence against the null proposition at a 1 % level.

Nevertheless, one of the main concerns in the literature is the consequences of a structural break in the unit root analysis. The power to reject the null decreases in standard tests, including ADF and PP tests, when the structural break is unaccounted for (Narayan, 2005; Perron, 1989); however, that is not the case in this study, except for the variable *lnTour*, we use Zivot and Andrew (1992) structural break model to confirm the unit root findings. Table 3 reports the Zivot and Andrews unit root with structural break test results. It is observed that the null assumption can be rejected at 1% for variables tourist arrivals, exports, and imports and at 5% for total trade volume. In other words, the variables in the study are breakpoints that are stationary at levels. This indicates that the results found in the ADF and PP test methods are valid.

Table 3. Unit root test with a structural break

Variables	Zivot and Andrew Test		
	t-stats	k	Break Date
<i>lnTour</i>	-7.391*	4	2018M1
<i>lnTra</i>	-5.531**	2	2015M1
<i>lnExp</i>	-6.761*	4	2016M2
<i>lnImp</i>	-7.686*	0	2015M1

Note: * and ** denote significance levels at 1% and 5% level. Critical test values of Zivot and Andrew (1992) are -5.57 and -5.08 at 1% and 5%, correspondingly. Model C, which includes breaks both in intercept and trend is used for the unit root test.

ARDL cointegration test

Following the determination of the integration order, a long-run equilibrium association between the variables is investigated using the Bounds test for cointegration within the framework of ARDL modelling. Although $I(0)$ variables do not require further cointegration tests, it is crucial to ensure that variables indeed share a long-run cointegration association. This entails utilising the subsequent unrestricted error correction model (UECM) to examine the presence of a long-term relationship:

$$\Delta \ln Tour_t = \alpha_{0y} + \sum_{j=1}^n \beta_{1y} \Delta \ln Tour_{t-j} + \sum_{j=1}^n \delta_{1y} \Delta \ln Tra_{t-j} + \alpha_{1y} \ln Tour_{t-1} + \alpha_{2y} \ln Tra_{t-1} + \varepsilon_t$$

$$\Delta \ln Tra_t = \alpha_{0x} + \sum_{j=1}^n \beta_{1x} \Delta \ln Tra_{t-j} + \sum_{j=1}^n \delta_{1x} \Delta \ln Tour_{t-j} + \alpha_{1x} \ln Tra_{t-1} + \alpha_{2x} \ln Tour_{t-1} + \varepsilon_t$$

Tour is international tourism inflows and *Tra* is international trade. Δ is the first difference between the variables. A similar UECM of *Tour* is run with export (*Exp*) and import (*Imp*). By assessing the significance of the lagged levels of the variables, the F test and F-statistics are used to ascertain the existence of a long-run relationship between the variables. The null hypothesis: $H_0: \alpha_{1y} = \alpha_{2y} = 0$ of no cointegration is examined against the alternative: $H_0: \alpha_{1y} \neq \alpha_{2y} \neq 0$. Narayan (2005a) argues that the F critical figures stated in Pesaran et al., (2001) are based on a larger sample and can deviate from a small sample study. Thus, we used the critical value based on Narayan (2005a). The critical values of estimated F statistics are also reported in Table 4. There are two stated sets of critical values that cater for all the regressor classifications: I(1) or I(0), or mutually cointegrated. According to Pesaran et al. (2000), the different conditions include unrestricted intercept with a restricted trend, deterministic trend, no trend, and restricted intercept with no trend. As a result, the cointegration is examined using four different conditions.

Table 4. Bounds critical values from ARDL modelling

	10%		5%		1%	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
$k = 2$						
FS_i	2.44	3.28	3.15	4.11	4.81	6.02
FS_{ii}	5.59	6.26	6.56	7.3	8.74	9.63
FS_{iii}	4.04	4.78	4.94	5.73	6.84	7.84
FS_{iv}	3.113	3.61	3.74	4.303	5.157	5.917

Note: Critical bounds values are computed using the ARDL procedure based on sample size. k is the number of regressors. FS_i is the unrestricted intercept and restricted trend model, FS_{ii} is the unrestricted intercept and trend model, FS_{iii} is the unrestricted intercept and no trend model, FS_{iv} is the restricted intercept and no trend model.

VECM Granger causality procedure

Based on long-run cointegration, we conduct the Granger causality procedure to examine the evidence of the nature of causality between global tourism and various international trade series. Granger (1988) emphasises that if the series are cointegrated, there is a possibility of Granger causation in at least a single direction. All other things being equal, if a series x_t can Granger cause y_t ($x \rightarrow y$), it is possible to predict y_t more accurately by using past values of x_t . The Granger causality requires estimating the regression of the form:

$$y_t = \vartheta_t + \sum \gamma_j y_{t-j} + \sum \delta_j x_{t-j} + \varepsilon_t$$

Where ϑ_t is the deterministic parameter, which can consist of a constant and a trend. ε_t is the error component. In the cointegration system, if $\delta_1 = \delta_2 = \dots \delta_k = 0$ (null proposition), x_t does not Granger cause y_t . This null hypothesis can be examined using Fisher's F test. The F test will observe Fisher's F-distribution when the series are stationary (Granger & Newbold, 1974).

In this analysis, there are four sets of Granger causality tests examined using the tourism and trade series. Given that the series are cointegrated and causality can exist in at least one direction, a dynamic specification with error correction form is applied when examining the Granger causality³.

³ Engle and Granger (1987) suggest that VAR in difference is mis-specified if nonstationary series are cointegrated.

To this end, the traditional VAR model above is augmented with an error correction term with a lagged period, which is derived from a cointegrated model based on the least square (LS) estimation. Thus, the Granger causality analysis is examined on the following regression:

$$\begin{aligned} \Delta \ln y_t &= \vartheta_{1t} + \sum_j \vartheta_{1j} \Delta \ln y_{t-j} + \sum_j \vartheta_{2j} \Delta \ln x_{t-j} + \gamma_{1j} ECT_{t-1} \\ \Delta \ln x_t &= \vartheta_{2t} + \sum_j \vartheta_{2j} \ln x_{t-j} + \sum_j \vartheta_{2j} \Delta \ln y_{t-j} + \gamma_{2j} ECT_{t-1} \end{aligned}$$

Δ is the original difference of the variables and j represents the lag order. The significance of long-run Granger causality is indicated by the t-statistics of the lagged error variable, whereas the differenced variables show evidence of the direction of short-term Granger causality. In the causality analysis, literature argues for an appropriate lag length (0) based on different techniques such as AIC, SC, and HQ criteria. Accordingly, the appropriate lag of two using AIC and SC criteria, and three using HQ was determined. Thus, the most lag order is set to three and equations (4) and (5) were examined for each lag. To ensure the results are not affected by lag structure, Pindyck and Rubinfeld (1991) also emphasise the importance of running the test at different lags.

Empirical Results

ARDL Cointegration results

Table 5 presents the Bounds cointegration test results between international tourism and trade variables under different estimation conditions and reports the estimated F-statistics of relevant models. The null hypothesis of no cointegration is rejected at acceptable decision levels in all four models, suggesting the presence of a level relationship between the pair of variables. The consistently significant statistics in models (1) and (2) show compelling evidence of a long-term relationship between tourism and trade and tourism and exports. Although we can safely decline the null for the regression of imports on tourism, it is less clear in the FS_{ii} Model. The reverse regression (tourism on imports) clearly supports the rejection of the null hypothesis. The relationship between exports and imports is also significant.

Table 5. Cointegration-bounds test

Variables	Deterministic trend		No deterministic trend		Conclusion
	FS_i	FS_{ii}	FS_{iii}	FS_{iv}	
H_u					
(1) <i>Tra and Tour</i>					
$FS_{Tra}(Tra/Tour)$	11.72	17.53	17.51	11.90	Reject
$FS_{Tour}(Tour/Tra)$	28.19	42.24	16.14	10.76	Reject
(2) <i>Exp and Tour</i>					
$FS_{Exp}(Exp/Tour)$	18.53	27.52	19.14	12.77	Reject
$FS_{Tour}(Tour/Exp)$	22.72	34.05	15.92	10.65	Reject
(3) <i>Imp and Tour</i>					
$FS_{Imp}(Imp/Tour)$	7.02	3.47	13.81	9.47	Reject
$FS_{Tour}(Tour/Imp)$	24.63	36.68	17.29	11.53	Reject
(4) <i>Imp and Exp</i>					
$FS_{Imp}(Imp/Exp)$	10.15	15.10	12.97	8.91	Reject
$FS_{Exp}(Exp/Imp)$	9.93	14.52	14.97	9.98	Reject

Note: Schwartz Criteria is used to choose the lag order needed in the cointegration check. FS_i is the unrestricted

intercept and restricted trend model, FS_{ii} is the unrestricted intercept and trend model, FS_{iii} is the unrestricted intercept and no trend model, FS_{iv} is the restricted intercept and no trend model.

VECM Granger causality results

The main objective of this analysis is to examine the causality direction between tourism inflows and global trade. In order to achieve this, a vector error correction model (VECM) based on Granger causation analysis was employed. Table 6 provides the short-run and long-run causality results based on the error correction adjustment model. The F-statistics are for the lagged independent variables of the adjustment model, indicating whether there is evidence of a causal effect in the short run. The lagged error correction term (ECT_{t-1}) based on the t-statistics indicate whether there is evidence of long-run causality.

Beginning with the first set (*Tra and Tour*), trade is significant in lag 1 and 2, while tourism is significant at 2 and 3 in the short run. The lagged error correction term for long-run causality is also significant in trade and tourism regression, except in lag 3. This implies that there is a bidirectional causality between total trade volume and tourism, both in the short run and long run.

A similar result was obtained in the second regression (*Exp and Tour*). Both exports and tourism exhibit significant short-run F statistics and lagged error adjustment terms for the long run, indicating strong bidirectional causation both in the short and long run. This result is also consistent with different lags indicating robust causality between exports and tourism inflows. With respect to the third set (*Imp and Tour*), while imports are significant at 1% in the short (in lag 1) and long run (in lag 1 and 2), tourism is only significant in the long run-in lag 1. This suggests that while there is both short-run and long-run causality running from import to tourism, there is only a long-run causality from tourism to import. In the fourth set (*Imp and Exp*), there is a long-run Granger causality running from import to export at 1% level and a short-run Granger causality running from export to import at 5% level. This suggests a strong unidirectional causality running from import to export in the long run and a relatively weak short-term unidirectional causation running from export to import.⁴ From a tourism perspective, the Granger causality results suggest that changes in tourism are a function of disequilibrium in the cointegration relationship. In other words, in the long run, trade series generate tourism, indicating causality runs interactively through the error correction mechanism.

The results on total trade and tourism are consistent with studies by Shan and Wilson (2000) and Katircioglu (2009). Shan and Wilson (2000) identified bidirectional causality among the variables in the case of China. Katircioglu (2009) found causation from trade to tourism in the long and short run for Cyprus. However, unlike ours, Katircioglu (2009) did not find long-run causality from tourism to trade. Kulendran and Wilson (2000) found a unidirectional connection from all trade to tourism for the USA and UK. While our long-run finding that exports and imports Granger cause tourism is consistent with Katircioglu (2009), it differs in the reverse regression. Similarly, the findings of the long-run unidirectional causation from import to export and short-run causation from export to import are consistent with Katircioglu (2009).

⁴ As suggested by a reviewer and given that trade service is part of the total trade and service export, models (1) and (2) are re-estimated by removing service components. However, the results remain consistent with the earlier findings.

Table 6. VECM Granger causality test

Null	1		2		3	
	F-stats	ECT_{t-1}	F-stats	ECT_{t-1}	F-stats	ECT_{t-1}
<i>(1) Tra and Tour</i>						
$FS_{Tra}(Tra/Tour)$	9.29*	-0.44*	9.79*	-0.46*	5.23	-0.25*
$FS_{Tour}(Tour/Tra)$	2.16	-0.33*	7.4**	-0.21***	9.58**	-0.02
<i>(2) Exp and Tour</i>						
$FS_{Exp}(Exp/Tour)$	6.16*	-0.24**	11.46*	-0.34*	20.15*	-0.41*
$FS_{Tour}(Tour/Exp)$	3.04***	-0.55*	8.45*	-0.51*	24.43*	-0.28*
<i>(3) Imp and Tour</i>						
$FS_{Imp}(Imp/Tour)$	6.34*	-0.31*	2.71	-0.18*	0.94	0.07
$FS_{Tour}(Tour/Imp)$	1.63	-0.18**	4.59	-0.01	2.14	-0.02
<i>(4) Imp and Exp</i>						
$FS_{Imp}(Imp/Exp)$	0.02	-0.17*	1.14	-0.01*	0.27	-0.11*
$FS_{Exp}(Exp/Imp)$	4.25**	-0.07	1.21	-0.00	2.72	-0.02

Note: *, **, and *** denote 1%, 5% and 10% significance, respectively.

Granger causality – bilateral analysis

Traditionally, as well as in the current economic relationship, two countries (Australia and New Zealand) have been the sources or tourism and trade partners for Fiji. They are also a key market for remittances with a large investor base. Hence, we use these two countries as studies for a bilateral analysis of the correlation between international tourism and trade.

We follow the same methodological procedure as in the aggregate analysis above. The unit root test, which is not reported here to save space but is available on request, indicates that [Tour, Tra, exp and imp] are stationary. Based on this, long-run cointegration tests were conducted with unrestricted intercept and restricted trend. We tested this long-run cointegration for three regressions, which include trade and tourism, export and tourism and import and tourism for each country.

Table 7. Granger causality test: Fiji and Australia

	Tra	Tour	ECT_{t-1}
Tra	-	0.79	1.01
Tour	5.80**	-	-0.56*
<hr/>			
	Exp	Tour	
Exp	-	1.11	0.00
Tour	6.82**	-	0.07*
<hr/>			
	Imp	Tour	
Imp	-	0.69	1.01
Tour	5.61***	-	-0.56*

Note: *, **, and *** denote 1%, 5% and 10% significance, respectively.

In the case of Australia, the estimated F-statistics for long-run cointegration across all three regressions are greater than the upper critical bounds at a 1% significance level, leading to a rejection the null hypothesis of no cointegration⁵. Following this, we examine the direction of causality based on VECM Granger causality. Table 7 provides the Granger causality results within the error correction mechanism between Fiji’s trade and tourism with Australia. There is a long-run causality running from total trade volume to tourism at 1% and a short-run causality running from total trade

⁵ The cointegration relationship results are not reported but are available on request.

to tourism at 5% level. Regarding exports and tourism, the results indicate that there is short-run causality from exports to tourism at a 5% significance level and long-run causality at a 1% significance level in Australia. Similarly, the results for imports and tourism shows that there is Granger causality running from imports to tourism in the short run and long run at 10% and 1%, respectively. Thus, there is a unidirectional relationship from trade to tourism in Fiji with respect to Australia, both in the short as well as in the long run. The short-run causality between exports and imports and tourism should be observed with caution, as it is only weakly significant; however, the long-run causality is statistically significant.

Table 8. Granger causality test: Fiji and New Zealand

	Tra	Tour	ECT_{t-1}
Tra	-	4.42	0.12
Tour	6.34**	-	-0.38*
	Exp	Tour	
Exp	-	5.67***	0.21
Tour	6.82**	-	-0.38*
	Imp	Tour	
Imp	-	4.24***	0.11
Tour	6.25**	-	-0.39*

Note: *, **, and *** denote 1%, 5% and 10% significance, respectively.

Table 8 presents the causality result with respect to Fiji and New Zealand. The F-test for long-run cointegration shows that trade and tourism are also cointegrated in New Zealand. Like in Australia, there is a short-term causality relationship between total trade volume and tourism at 5% level and a long-run causality at 1%. In terms of export and tourism, while only short-run interconnection is observed from tourism to export at a 10% level, there is both short-run and long-run causality running from export to tourism for Fiji with respect to New Zealand, at 5% and 1%, respectively. Further, tourism from New Zealand is observed to influence imports in the short run at a 10% level, while imports influence tourism both in the short run and long run at 5% and 1%, respectively. Thus, there is a bidirectional relationship between export and tourism and import and tourism in the short run and a unidirectional relationship in the long run proceeding from export to tourism and import to tourism.

Discussion and Study Implications

The results from the econometric analysis are described in two parts. First, the ARDL bounds test for cointegration indicates that there is a long-run relationship between international trade and tourism. This finding was observed at both the aggregate and disaggregate levels, specifically with two major trade and tourism partners (Australia and New Zealand). In other words, trade and tourism, export and tourism, and import and tourism tend to show common trends. This long-run pattern remained consistent when cointegration was tested under different regression conditions. The cointegration pattern also remained consistent when we examined trade and tourism relations between Fiji and Australia as well as Fiji and New Zealand. The overall common long-run trend results between trade and tourism are pleasing and suggest support for the proposition that there is an equilibrium relationship between these two important variables.

Secondly, the co-movement of the series suggests that there could be causality in at least one direction. As a result, the Granger causality test within the VECM was implemented to examine the

various relationships between trade and tourism. The Granger causality results indicate that there is bidirectional causality between total trade volume and tourism, both in the short and long run. The export and tourism regression shows strong evidence of bidirectional causality both in the short run and in the long run. This is interesting as it reveals that while inbound tourism can significantly predict merchandise exports, trade promotion can also attract tourist inflows. Regarding imports and tourism, while there is evidence of short-run unidirectional causality running from imports to tourism, there is also long-run bidirectional causality between imports and tourism. Furthermore, a country-wise analysis reveals a unidirectional relationship between trade, exports, and imports, and tourism in Fiji, particularly with respect to Australia, in both the short and long run. The causality analysis with respect to New Zealand provides a relatively different outcome. We find a short-term bidirectional connection between export and tourism, and import and tourism as well as a unidirectional relation in the long run from export to tourism and import to tourism.

These findings largely align with various propositions identified in the literature. First, there is encouraging support for the ‘interest and awareness’ hypothesis, which states that international trade leads to tourism and travel. The findings relating to this hypothesis are more evident. For instance, total trade volume, exports, and imports all significantly Granger cause tourism in Fiji. The support for this hypothesis is also evident in Fiji when examined with its major trade and tourism partners, Australia and New Zealand. Second, there is some support for the ‘opportunity hypothesis’, which states that international travel leads to the creation of trade opportunities. This is particularly evident with respect to exports, tourism Granger causes export, both in the short and long run. Tourism also generates imports in Fiji, but only in the long run. This pattern is also repeated between Fiji and New Zealand in the short run. Third, the claim that ‘tourism leads to high imports’ in Fiji is also tested. There is a long-run causality from tourism to imports in the aggregate analysis. However, this pattern differs in a country-wise analysis. For instance, we find only short-run causality with New Zealand but there is no evidence of that tourism is causing imports with Australia. The lack of consistency in causality direction in bilateral partners indicates the diverse trading relations with Fiji. However, these findings have important economic policy implications. This is vital, especially in understanding the dynamics between tourism and trade, as well as paying attention to trends. Based on this empirical support, future policy design should consider the significant link between tourism inflows and trade in order to recognise the significant influence tourism inflows and trade have on each other. Further, the findings reported here also provide support for further research on these propositions. For example, the present analysis is restricted to only two (Australia and New Zealand) bilateral trade and travel partners of Fiji. The analysis could be extended to examine a wider range of bilateral partners, including developed and large developing countries. Fiji and the Pacific have large tourism sectors and depend on tourism inflows from their developed partners, where many people regularly look for travel opportunities. Second, there are several motivations for international travel, such as business travel, sport, education, and holiday travel, amongst others. Data on these motivations is important to investigate the relationship between trade and tourism at a more disaggregated level for targeted policy interventions. The global pattern of open, bilateral, multilateral, and regional trade and tourism relations has evolved, and further discussion and investigation are valuable for achieving better economic policy outcomes.

Conclusion

This paper, contributes to existing research on the relationship between international tourism inflows and global trade. Specifically, we investigate the long-run association between tourism inflows and various trade series, both at the aggregate and bilateral level. To achieve this, we compiled a monthly

data set for Fiji and its two major trade and tourism partners (Australia and New Zealand). The ARDL cointegration and Granger causality empirical methodology were used, for trade series and international tourism inflows modelling. The findings reveal a significant long-run relationship between trade series and tourism inflows. Granger causality with an adjustment mechanism reveals significant connectedness between various series of trade and tourism inflows, reinforcing prior theoretical beliefs. The bilateral analysis with Australia shows unidirectional causality from total trade, exports, and imports to tourism. In the case of New Zealand, a short-run bidirectional (trade and tourism) and long-run unidirectional (trade to tourism) causality is observed. The findings highlight significant causality patterns that are valuable for policymakers to foster tourism for Fiji and other island nations in the region

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