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Working Paper

Modelling Fiji's Tourism Arrivals

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Abstract

This paper models tourism arrivals in Fiji by estimating the determinants of tourist arrivals from eight key source countries—Australia, New Zealand, United States (US), Canada, Japan, United Kingdom (UK), Continental Europe and South Korea, which together accounts for approximately eighty-five percent of total tourist arrivals in the country. Using an ARDL bounds test and quarterly data from several sources for the period 2001 to 2016, results show that except for Japan, all markets are highly income sensitive, and the South Korean, Japanese and Canadian markets are highly price sensitive. Travel costs are significant for the Australian, Japanese and UK markets. Geographical price is highly significant and elastic for the UK and US markets. The results suggest a need for closer collaboration with Australia and New Zealand to increase the contribution of the long haul markets.

Introduction

International travel continues to grow rapidly, securing the tourism sector as a key driver of economic development. According to the United Nations World Tourism Organisation (UNWTO), international tourist arrivals worldwide reached a total of 1,322 million in 2017; an annual increase of 7.0 percent. The 2017 results were well above the sustained and consistent trend of 4.0 percent growth since 2010 and the strongest on record in the past seven years (UNWTO, 2018). The current strong growth momentum is expected to continue in the coming years with international tourist arrivals forecast to reach 1.8 billion by 2030.

Tourism plays a vital role in Fiji as well, a small island developing economy in the South Pacific, and spans across a number of sectors including agriculture, transport, wholesale & retail, accommodation & food services and arts, entertainment & recreation. Tourism earnings surpassed the billion dollar mark, reaching $1.2 billion in 2010, a substantial increase from $328.1 million in 1992, and further to $1.8 billion in 2016. As a source of foreign exchange, tourism earnings outperform the next seven major contributors combined, including remittances, mineral water, sugar, gold, fish, garments and timber receipts *(see Table 4.0 in Appendix).* The number of tourist arrivals more than doubled and reached 792,320 in 2016, from 259,350 in 1991. According to the World Travel and Tourism Council (2017), the tourism sector in Fiji directly and indirectly accounted for 40.4 percent of GDP in 2016. This contribution is expected to grow further and reach 44.9 percent of GDP by 2027. In terms of employment, the tourism industry directly supported 42,500 jobs (13.0% of total employment) in 2016 while the total contribution to employment (including jobs

indirectly supported by the tourism industry) stood at 119,000 jobs (36.6% of total employment) (UNWTO, 2018) *(See Table 4.1 in Appendix).*

While there is a growing role and importance of tourism in the Fijian economy as the key source of foreign exchange earner and employment generation, it is imperative to pay more attention to the determinants of tourism arrivals in Fiji, not only from the two main markets of Australia and New Zealand, but also from the other key markets.

The objective of this paper is to model tourism arrivals in Fiji by estimating the determinants of tourist arrivals from eight source countries (Australia, New Zealand, US, Canada, Japan, UK, Continental Europe and South Korea) that account for around 85.0 percent of total tourist arrivals in Fiji.[1] The paper uses an ARDL bounds test modelling approach to ascertain the elasticities of income and relative prices in demand for Fiji from these source countries. Quarterly data from various sources *(see Section 4.4)* for the period 2001 to 2016 was utilised.

The results highlight the key role played by income and prices for both the short and long haul markets, with the latter also affected by the attractiveness of other close by tourism destinations. A careful study of economic activity and developments in source markets, rightly priced tourism products and closer collaborations with tourism bodies in Australia and New Zealand are the key policy recommendations of the study.

The rest of the paper is organised as follows: Section 2.0 provides a brief background on tourism in Fiji. Section 3.0 outlines a review of literature and

[1] While the Pacific Islands and Rest of Asia also makes up a significant percentage of Fiji's tourist arrivals, data constraints prevented further analysis on the two source markets.

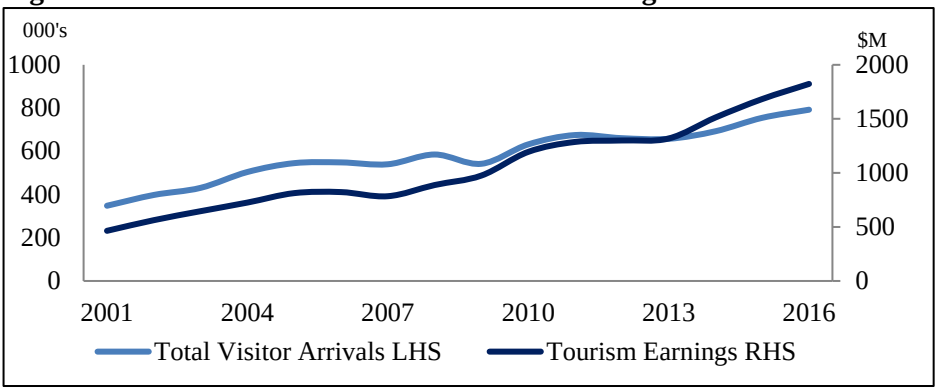
key findings on the studies of tourism arrivals. Section 4.0 describes data and model specifications while section 5.0 discusses the results/findings and policy implications, limitation of the current study and recommendations for areas of future research. Section 6.0 provides concluding remarks.

2.0 Context of the study

Tourism continues to be the major source of economic activity in Fiji and since the 1980s, the sector has surpassed all other traditional sectors of the economy such as sugar to become Fiji's number one foreign exchange earner. Despite the adverse impact from both external and domestic shocks especially natural disasters on the economy, the tourism sector has remained relatively resilient and has continued to grow relative to other sectors. For instance, in 2016, tourism earnings totaled $1.8 billion, more than seventeen times the sugar exports earnings of $103.1 million and represented also more than a threefold increase when compared to tourism earnings of $463.9 million in 2001. This is an indication that Fiji is dependent heavily on tourism for growth and development in the economy.

In terms of visitor arrivals, international visitor arrivals to Fiji have shown steady growth in the last two decades rising from a total of 348,014 in 2001 to 792,320 in 2016 (Figure 1).

Figure 1: Total Visitor Arrivals vs Tourism Earnings



Source: Fiji Bureau of Statistics

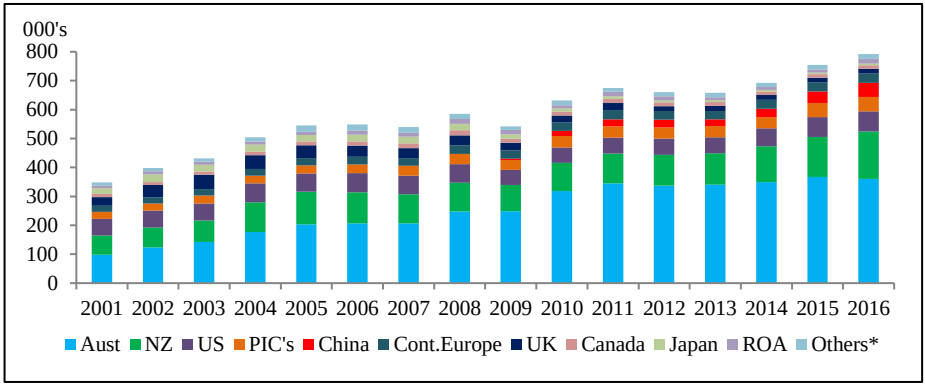
Visitors travelling for holiday purposes make up the largest proportion (75%) of all tourist arrivals to Fiji. A distinct seasonal pattern of visitor arrivals can be observed in Fiji, with arrivals peaking in July. The Australian and New Zealand arrivals peak in the southern winter months through to September and visitors from the northern hemisphere markets usually arrive during the northern winter time (World Bank, 2016). This year-round pattern works well for the tourism industry in Fiji. On average, tourists stayed in Fiji for about 9.5 days in 2016, higher than the average of 8.6 days in 2001.

2.1 Tourism Source markets

Since the commencement of tourism development in Fiji in the 1920s, the main source markets for visitor arrivals to Fiji have been Australia, New Zealand and the US (Pareti, 2015). The heavy dependence on these traditional source markets has not changed much over the years. Together, these traditional markets provided, on average, around 72.0 percent of total visitor arrivals to Fiji in the 2001-2016 period (Figure 2). Heavy reliance on traditional markets is a

concern as any downturn or unease in these economies will have larger negative implications on visitor arrivals to Fiji.

Figure 2: Visitor Arrivals Source Markets



** Includes South Korea, Malaysia, Hongkong, India and Taiwan*

Source: Fiji Bureau of Statistics

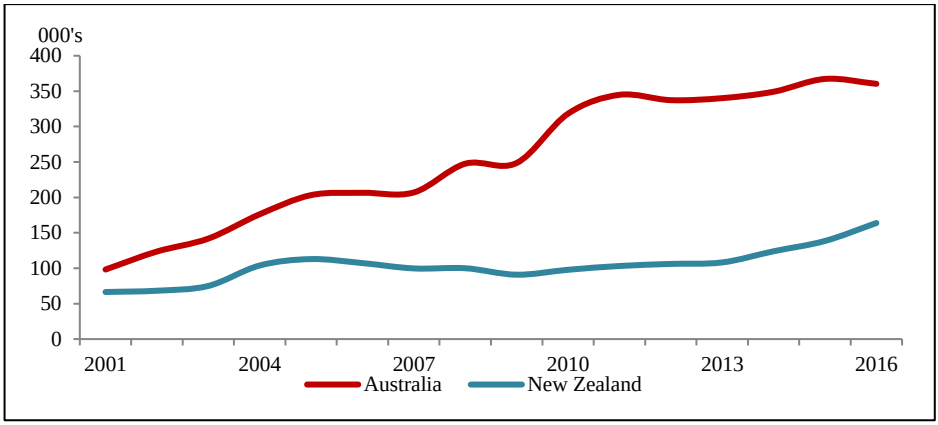
Short haul markets[2]

Australia and New Zealand remain the two major short haul markets for Fiji with geographic location advantage, regular and frequent flights with a relatively shorter flight time of between 3 to 5 hours. Visitor arrivals from Australia reached a staggering 360,370 in 2016, from just around 98,213 in 2001 (Figure 3). With Australia as the largest source market for Fiji Airways – the national carrier, there are in total 29 weekly return flights with more than 5,500 weekly seats offered by Fiji Airways for direct flights to Sydney, Melbourne, Brisbane and Adelaide. For New Zealand, the carrier offers 19 weekly return

[2] While there are no standard criteria to distinguish between short and long haul markets, for the purpose of this paper and after discussions with Ministry of Industry, Trade & Tourism, short haul markets are described as those markets whose flight duration is less than 5 hours. These include New Zealand and Australia. Long haul markets are those that are farther away from Fiji (the flight duration is greater than 8 hours). These include the US; Canada; the UK; Continental Europe; Japan and South Korea.

flights with approximately 3,200 weekly seats to Auckland, Christchurch and Wellington.

Figure 3: Visitor Arrivals from Short Haul Markets



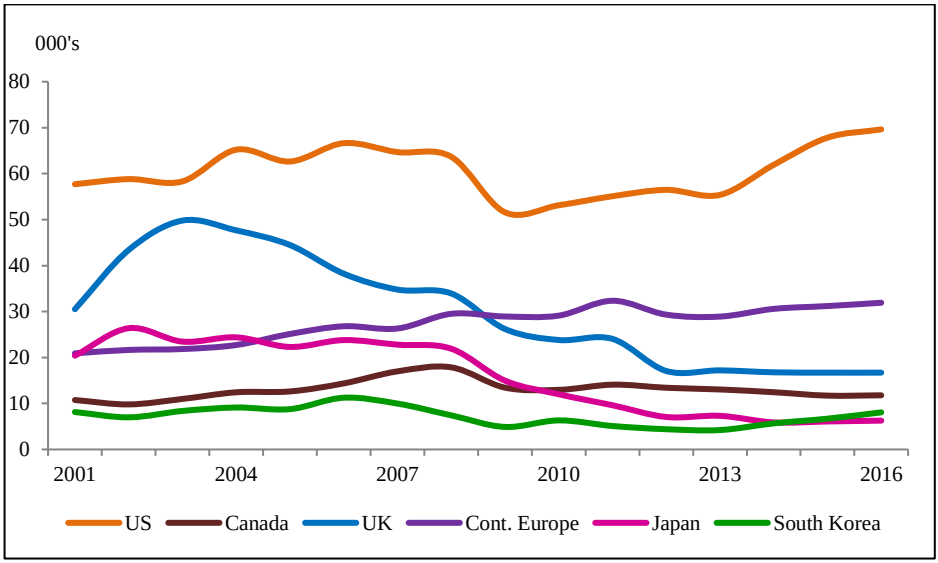
Source: Fiji Bureau of Statistics

Long haul and emerging markets

With the exception of the US which remains the third largest source country for visitor arrivals to Fiji, tourist arrivals from other distanced markets continues to be volatile and had declined following the GFC (Figure 4). Apart from more expensive airfares due to longer distance travel, the opportunity costs associated with time and convenience of travel are factors that affect tourist arrivals from long haul markets (Tveteras & Roll, 2011). Thus, improving long haul air connectivity might mitigate the negative effects of distance on tourist arrivals to some extent. Fiji Airways has been concentrating on improving flight connectivity with long haul networks. Codeshare agreements were signed with carriers such as Jet Airways and Hong Kong Airlines while direct flights to San Francisco and Singapore were introduced. In addition, tour operators have

capitalized on the Chinese New Year as an opportunity to attract Chinese tourists into the country during the off peak seasons (January-February). As a result, visitor arrivals from China have increased significantly over the years, from just over 4,000 visitors in 2009 to above 49,000 Chinese visitors in 2016[3], making China the fifth major source market for Fiji tourism. China and India are viewed as major emerging tourism markets for Fiji. While the number of Indian visitors to Fiji has more than doubled in the recent years (it reached 3,987 in 2016 compared to 1,836 in 2010), however, it still accounts for less than one percent of total visitor arrivals to Fiji.

Figure 4: Visitor Arrivals from Long Haul Markets



Source: Fiji Bureau of Statistics

[3] Prior to 2009, visitor arrivals from China were insignificant and were lumped together with other markets under the "others" category.

Japan emerged as an important source market for Fiji tourism during the 90's. However, following the Global Financial Crisis (GFC), tourist numbers declined leading to the discontinuation of direct flights from Fiji to Japan in 2009. The recommencement of flights to Japan through Narita from July 2018 is expected to boost visitor arrivals from Japan and other Asian countries. Moreover, with the resumption of Korean Air's Fiji flights in 2000[4], visitor arrivals from South Korea has remained steady, averaging around 7,300 visitors per year, in the 2001-2016 period.

Tourist arrivals from Canada and the UK have fallen from around 13,230 and 40,349 visitors on average during the 2001-2008 period, respectively, to an average of 12,868 and 19,822 visitors post GFC. Tourist arrivals from Continental Europe, our sixth largest source market remained positive over the years with a total of 31,916 visitors in 2016. The majority of visitors to Fiji are from Germany, France, Italy and Switzerland.

Moreover, while the industry is vulnerable to internal and external shocks, it has been resilient and able to recover quickly from the adverse effects of various shocks. For instance, despite the occurrence of the Category 5 Tropical Cyclone Winston and floods in 2016, visitor arrivals increased by 5.0 percent to a record high of 792,320. In the same period, tourism earnings also increased to $1.8 billion.

3.0 Literature Review

Internationally, there has been a growing interest in the study of tourism arrivals amongst researchers. A study of 121 journal papers on tourism demand

[4]Korean Air discontinued its flights to Fiji in March 1998 due to the deteriorating economic conditions in Korea.

modelling and forecasting from 2000 to 2006 indicates that visitor arrivals variable, measured by total tourist arrivals from a source country to the destination country, continues to be the most popular measure of tourism demand (Song & Li, 2008). For the demand variable, some studies also use tourist expenditures in the destination country while others employ tourist expenditures on particular tourism related products such as sightseeing, meals and shopping. Other tourism demand variables employed include tourism revenue, tourism related employment and tourism related exports and imports.

Identification and assessment of tourism demand sets the foundation for tourism related business decisions. Essentially, estimates of future expected demand plays a crucial role in planning activities of tourism-related businesses. In addition, it can assist with planning and investment into tourism related infrastructure in the destination countries as well as in assisting Governments with the formulation and implementation of appropriate tourism strategies.

In terms of methodology, studies on tourism demand basically fall into one of the two groups. The first group focuses on using time series models, where tourism demand as a dependent variable is investigated and forecasted by analysing historical trends, with no particular emphasis on finding the cause of the trend, by means of integrated autoregressive moving average models (ARIMAs). A better methodology is to employ econometric techniques which help to explain the causal relationship between the dependent and the independent variables. At the same time, estimated elasticities of tourism demand prove to be useful tool for policy recommendations and also help to analyse the effectiveness of the existing tourism policies. Some of the most common and effective econometric models identified include autoregressive

distributed lag (ARDL) models, error correction model (ECM) and vector autoregressive (VAR) models. The other emerging and more powerful modelling technique applied for tourism demand modelling include the almost ideal demand system (AIDS) that inspects tourism demand in a number of neighbouring destinations by a source market and enables the analysis of substitution and complementary effects between these destinations (Song & Li, 2008).

With regards to data frequency, annual data continues to be the most commonly used since explanatory variables at higher frequencies may be difficult to obtain (Song & Li, 2008). While annual data removes seasonal variability in a tourism demand model, the drawback is that seasonal characteristics or the prediction of seasonal variations of demand cannot be determined. Nonetheless, to deal with seasonality, seasonal dummies are included in higher frequency estimations if seasonality is ruled out as deterministic. In the event of stochastic seasonality, seasonal unit roots are identified and eliminated before the model is built. An emerging option is to employ mixed-frequency modelling techniques that allow the inclusion of variables with different frequencies in the model. By taking more information into consideration, mixed frequency techniques implicitly illustrate tourist behaviour more specifically and are able to generate better and more accurate forecasts.

Few studies have been conducted to ascertain a tourism demand function for Fiji. (Narayan, 2002) and (Narayan, 2004) used annual data from 1970-2000, coupled with the bounds testing approach and studied the relationship between visitor arrivals to Fiji from the source countries of Australia, New

Zealand and the US. Major findings revealed that the growth in income in the source countries leads to an increase in visitor arrivals to Fiji. At the same time, relative and substitute prices as well as coups were found to have a negative impact on visitor arrivals in the long run. Likewise, (Katafono & Gounder, 2004) used cointegration and error correction techniques and constructed a tourism demand model for Fiji using annual data from 1970-2002. Their findings revealed that major trading partners' income is positively correlated with tourism demand while coups were found to affect tourism demand negatively. More recently, (Gottschalk, et al., 2016) replicated the model used by (Narayan, 2004) to model Fiji's visitor arrivals. While the model did not produce desired results, however, it was concluded that the extensive provision of tour packages in the South Pacific region further complicates the challenge in obtaining relative price variables. The study recommended that more comprehensive price variables be utilised in future studies to be able to successfully apprehend the effects of prices on visitor arrivals.

4.0 Model Specification and Data

4.1 Theoretical Framework

Most tourism demand papers either use visitor arrivals or tourism expenditures (earnings) as the dependent variable, depending on the subject of interest (Song & Li, 2008). Several papers were more interested in per capita terms (Onafowora & Owoye, 2012). This paper tested both visitor arrivals in levels, VA_t and in per capita terms, VAp_t. However, given that both methods yield similar results, only those reported in level terms are presented in this paper

Explanatory variables in the literature normally revolve around two broad aspects - income and prices (see (Phakdisoth & Kim, 2007), (Ketenci, 2009), (Ayeh & Lin, 2011), (Salleh, et al., 2008), (Agyeiwaah & Adongo, 2016), (Song, et al., 2000) among others). Income is usually proxied by real GDP per capita if the source markets are dominated by business travellers and real Gross National Disposable Income per capita if it is dominated by holidaying visitors. Unlike income, price variables are numerous as they try to trace the costs involved from the visitor leaving the usual place of residence and returning, subject to a budget constraint. Typical price variables represent travel costs, tourist prices at destination relative to holidaying at home and the relative price of competitor destination. Returnees and the "word of mouth" impact also forms a major part of tourist arrivals. Most papers use the lagged value of the dependent variable to capture this (see (Onafowora & Owoye, 2012) for example). Some papers have attempted to model taste as an explanatory variable using time trend (Lim, 1997). However, this has been heavily debated as it is more to do with the characteristics of time series data rather than human behaviour. Other major one-off external and domestic shocks are represented by dummies. The external shock in the model represents the Global Financial Crisis (GFC) which coincided with the 2009 devaluation of the Fiji dollar. Internal shocks include natural disasters and political instability. Studies have shown that politically motivated conflict and violent events negatively impact tourist arrivals (Neumayer, 2004).

Flowchart 1 below tries to simplify the decision making process taken by a typical tourist and how such decisions are modelled in this paper. A description of the variables used are provided thereafter.

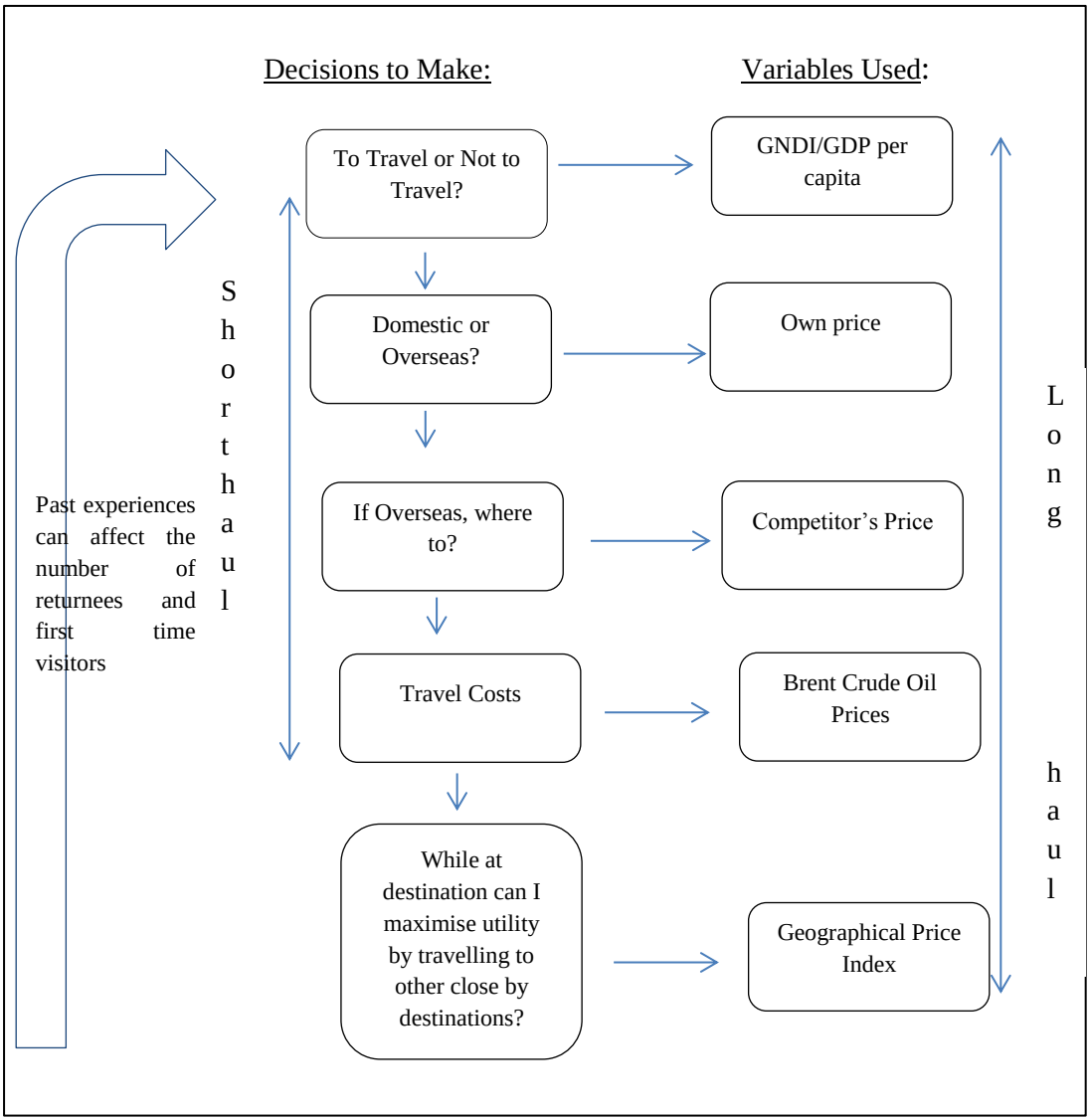
4.2 Variables Used

While the variables used were generally the same for all the eight markets, this paper aims to distinguish short haul and long haul markets with the latter using an additional geographical price variable.

Income

Majority of visitor arrivals to Fiji are for holiday purposes (Ministry of Industry, Trade and Tourism, 2014) thus suggesting the use of real disposable income per capita, Y_t. However, complete data was only available for the Australia and the UK markets. Thus, Real GDP per capita was used for the other six countries as a proxy for income levels.

Flowchart 1: A Typical Tourist Decision Making Process



Prices

There are generally two forms of costs that need to be accounted for: travel costs and ground costs – which refers to the prices of goods and services that are normally consumed by the tourist at the destination.

Without proper data sets for airline costs, the price of Brent crude oil, B_t (or Oil_t), was used as a proxy for travel costs. The arguments in this case is that, unlike big carriers, small carriers such as Fiji Airways, which bring in most of Fiji's visitors, is likely to have aviation fuel as the major expense line in its books, and may find it hard to spread such costs and remain competitive given its limited number of fleets and routes. While Fiji Airways does have codeshare agreements with the big overseas carriers for its long routes, there is high probability that the variation in costs will be absorbed by the local airline.

In the current era of package tours and visits, there are not many price indices common across countries. Packaging complicates the analysis of travel and ground costs in destination countries (Gottschalk, et al., 2016). Apart from the lack of relevant data on hotel and accommodation costs, pinning down relative prices of package deals can also be an issue as consumer preferences are different and the availability of specialised natural attractions such as zoos are not common in the South Pacific, thus, it may be unfair to make relative price comparisons against Bali, for instance.

The alternative is to use a more comprehensive price index.[5] Rational travellers are also likely to eat out, use public transport means, buy local fruit

[5] Using cpi excluding non-tourist components such as education and housing would be a reasonable starting point. However, relevant data for the eight source markets understudy were not readily available.

and vegetables and groceries from local supermarkets and pay local communication and internet services which are not readily available at low costs as in other markets. Many visitors in Fiji also use rental cars for ease of travel. However, these factors on their own cannot be the main attractions to Fiji. Thus, this paper first considered consumer price index (cpi) adjusted for exchange rate movements as a proxy for tourist prices[6] as the pricing of package tours and visits are likely to vary with domestic prices.

In line with most tourism demand studies (such as (Phakdisoth & Kim, 2007), (Ketenci, 2009), (Ayeh & Lin, 2011), (Salleh, et al., 2008), (Agyeiwaah & Adongo, 2016), (Song, et al., 2000) among others), this paper considered two forms of tourist price indices, own price and competitor price.

Own price, Op, captures the decision of a potential tourist to choose between domestic or international destination.

$$Op_{it} = \frac{CPI_{(f,t)}/EX_{(f,t)}}{CPI_{(i,t)}/EX_{(i,t)}} \quad (1)$$

where $CPI_{(f,t)}$ and $CPI_{(i,t)}$ represents consumer prices in Fiji and at source country at time t, and $EX_{(f,t)}$ and $EX_{(i,t)}$ represents the respective exchange rates. We expect the sign to be negative as higher tourist prices in Fiji relative to the source country would dissuade a possible visitor.

[6] There may be arguments that using Fiji's CPI as a proxy for tourist price is a bit far-fetched. This is given that Fiji's CPI is dominated by food and fuel products compared to our tourist source markets thus will skew relative price measures, by construction. However, a careful understanding of the CPI story in Fiji attest to the fact that major swings in food prices are only related to natural disasters and adverse weather patterns. Without these shocks, food prices are generally stable. Similarly, fuel prices only move out of 'normal zones' when there is a major shock to international oil markets. These effects are somewhat toned down, although not eliminated, by seasonal adjustments and the natural disasters' dummies. It is also a common understanding that hotel accommodation and meals are priced way above that captured in the CPI. Therefore, using CPI only provides a bare minimum benchmark for the actual tourism prices in Fiji.

The decision of a potential tourist to visit Fiji can also be affected by prices at a particular competitor destination, Cp.

$$Cp_{ct} = \frac{CPI_{(c,t)}/EX_{(c,t)}}{CPI_{(i,t)}/EX_{(i,t)}} \quad (2)$$

Prices in competitor destination are measured against prices in the source country. Ideally, it would be fair to compare Fiji against similar-sized countries or those that share similar attractions. However, what is of interest in this paper is where the masses are heading to. We termed such countries as our competitors.[7] As such, in the context of this paper, New Zealand is considered Fiji's competitor for the Australian tourism market and vice-versa for the New Zealand market, Euro zone for the US and UK markets, Japan for the South Korean market, the US for the Japanese and Canadian markets and the UK for the Euro Zone market.[8]

The sign can be both positive and negative. If the sign is positive, then the destination is considered a substitute destination to Fiji as high prices in competitor destination will attract more tourists to Fiji. If the sign is negative, the destination is considered a complementary one.

However, the usefulness of Op and Cp in its current form is limited for two reasons: (i) there is a huge disparity in the composition of cpi baskets between developing economies (like Fiji where food and fuel items dominate the basket) and developed economies (where the weighs tend to be more evenly

[7] The drawback of this assumption is that Fiji is not after the same set of tourists. However, determining the exact number that would have opted for Fiji is not straight forward.
[8] Top tourist destinations for the eight markets were obtained from its respective tourism bodies and national statistics agencies.

spread out); and (ii) market based exchange rates tend to exclude the non-tradable sector that tourists are also likely to make use of (Callen, 2017).

To account for this, the paper uses the Purchasing Power Parity (PPP) conversion factor which represents the costs involved in different destinations to consume the same basket of goods and services relative to a selected country, in most cases the US.[9] In other words, PPP measures the ratio of prices in national currencies of the same good or service in different countries (OECD/Eurostat, 2012).

As such equation (1) is replaced by

$$Op\_PPP_{it} = \frac{PPP_{(f,t)}}{PPP_{(i,t)}} \tag{1a}$$

where $PPP_{(f,t)}$ represents Fiji's PPP conversion factors for private consumption (measured in national currency per US$) while $PPP_{(i,t)}$ shows that of the source country. The interpretation is straightforward. For instance, a potential visitor from Australia, country i under this definition would consider prices in Fiji more expensive if the ratio is increasing overtime.

Similarly, Cp will take the form of

$$Cp\_PPP_{ct} = \frac{PPP_{(c,t)}}{PPP_{(i,t)}} \tag{2a}$$

[9] Given that the interest is on spending, PPP conversion factors for private consumption was used. The other alternative was PPP conversion factors for GDP. Data were sourced from OECD and the World Bank.

where $PPP_{(c,t)}$ represents the PPP conversion rates of the competitor destination. If the ratio increases over time then Fiji is gaining its attractiveness as opposed to that of the competing destination.

Given the costs involved in travelling for long haul routes, rational visitors from Europe, the UK and North America, are more likely to travel to Fiji and some other nearby countries before returning.[10] The concept of 'cumulative attraction offers' provides support for such multi-destination trips (Lue, et al., 1993). The hypothesis made in this paper is that long haul travellers look at multiple nearby destinations before making decisions to travel to Fiji. As such, this paper introduces a geographical price index, Gp which refers to the weighted sum of PPP for Fiji, New Zealand and Australia.

This can be represented by the following

$$Gp_t = x * PPP_{(f,t)} + y * PPP_{(aus,t)} + z * PPP_{(nz,t)} \quad (3)$$

where x,y and z are weights based on the importance of the long haul market to total visitor arrivals of the three respective countries.[11] The weights are adjusted every year. The weighting signifies that it is possible that more UK tourists, for example, visit Australia and New Zealand than Fiji, but Fiji can be the worst hit if it makes up a higher proportion of its visitors base. The total weights should add up to 1.

[10] In line with the 2014 IVS results, long haul visitors that are likely to travel to other destinations are those from Canada, Euro area, the UK and the US.

[11] Ideally, the weights should be based on the share of expenditures tourists from long haul markets spent on the three countries.

As with own price, we expect an inverse relationship between the geographical price and visitor arrivals. If the Gp index is increasing, then the three countries are losing their attractiveness from the viewpoint of a potential long haul tourist.

Dummies

The paper uses four broad categories of dummy variables for natural disasters, political instability (2006), financial crisis and devaluation. Quarterly dummies were also used. Natural disasters include Tropical Cyclone Winston (February 2016); Cyclone Evan (December 2012); Cyclone Tomas (March 2010); Cyclone Mick (December 2009); Cyclone Ami (January 2003); Floods in 2016 (April/December); 2012 (January/March); 2009 (January) ; 2007 (February/March/April) and 2004 (April). The Global Financial Crisis in 2009 (April) coincided with the devaluation episode in Fiji. The series takes the value of 1 in the period of the event and 0 otherwise. Given the extent of the GFC, all the quarters in 2009 take the value of 1.

4.3 Econometric Methodology

The paper uses the Auto Regressive Distributed Lags (ARDL) Bounds Testing Approach (Pesaran, et al., 2001). Unlike the advanced method of cointegration such as Johansen and single-equation Engle-Granger and Phillips-Ouliaris, the ARDL method has advantages in that it does not require variables to be of the same order of integration (I(0), I(1) or even mutually cointegrated) to prove cointegration,[12] it can work with small sample sizes and the method can

[12] However, the methodology does not apply to variables of integration order above 1. This necessitates the testing of unit roots.

be used to estimate short run and long run coefficients simultaneously. Equation (4) provides the general starting point for all the models.

$$lnVA_{it} = \alpha_0 + \sum_{j=1}^{4} \gamma_{ij} lnVA_{it-j} + \sum_{j=0}^{4} \beta_{ij} lnY_{it-j} + \sum_{j=0}^{4} \partial_{ij} lnB_{it-j} + \sum_{j=0}^{4} \vartheta_{ij} lnOp_{it-j} + \sum_{j=0}^{4} \emptyset_{ij} lnCp_{it-j} + \sum_{j=0}^{4} \varphi_{ij} lnGp_{it-j} + dummies + \varepsilon_{it} \quad (4)$$

All variables, apart from the dummies, were first transformed into logarithms and were seasonally adjusted. A maximum lag of 4 was then selected. The selection of the preferred model was based on the Akaike Information Criterion (AIC) after modelling all possible lag combinations of the dependent and independent variables. Apart from AIC, eliminations were also made on level variables that deviate from economic theory (having the wrong sign even though the variables were significant) (Results presented in Table 1_Panel A). Thus the selected models will not necessarily have significant coefficients for its short run dynamic components, which are not of interest to this study, but rather the sign of cointegration coefficient derived from it (Results provided in Table 2_Panel A).

The bounds test for cointegration was then performed whereby the computed F-statistic was compared against the upper (I(1)) and lower bounds (I(0))(Pesaran, et al., 2001). If the F-statistic falls below the lower bound's critical values at ten percent, five percent or one percent levels, the null hypothesis of no long run relationship cannot be rejected. If the F-statistic is above the upper bound's critical values, the null is rejected implying the presence of a long run relationship. The test is inconclusive if the F-statistic

falls within the upper and lower bounds (Results presented in Table 1_Panel B). The paper makes use of the ARDL modelling technique introduced in Eviews 9.0.

The focus on identifying the long run relationship among key variables is for two reasons.[13] First, the paper uses quarterly data thus it is unlikely that decisions will be reversed based on temporary developments in a time period. Second, overseas visits are infrequent and thus are planned well ahead of time with reasonable buffers. In that spirit, the tourist demand models for the eight countries were applied the same variables initially, apart for Gp which was only used for long haul visitors.

The selected ARDL model (Table 1_Panel A) for each market obtained from (4) are then re-written to provide the long run elasticities (Table 2_Panel B) below for income, Brent crude oil, own price, competitor price and geographical price (for long haul markets only), respectively.

$$lnVA_{it} = \left[\frac{\alpha_0}{1-\sum_{j=1}^{4}\gamma_{ij}}\right] + \left[\frac{\sum_{j=0}^{4}\beta_{ij}lnY_{it}}{1-\sum_{j=1}^{4}\gamma_{ij}}\right] lnY_{it} + \left[\frac{\sum_{j=0}^{4}\partial_{ij}}{1-\sum_{j=1}^{4}\gamma_{ij}}\right] lnB_{it} + \left[\frac{\sum_{j=0}^{4}\vartheta_{ij}}{1-\sum_{j=1}^{4}\gamma_{ij}}\right] lnOp_{it} + \left[\frac{\sum_{j=0}^{4}\emptyset_{ij}}{1-\sum_{j=1}^{4}\gamma_{ij}}\right] lnCp_{it} + \left[\frac{\sum_{j=0}^{4}\varphi_{ij}}{1-\sum_{j=1}^{4}\gamma_{ij}}\right] lnGp_{it} \quad (5)$$

4.4 Data

The paper uses quarterly data from 2001Q1 to 2016Q4. Real GDP, disposable income, cpi and the exchange rate data were sourced from the

[13]The demand elasticities presented below were transformed from the selected ARDL model for each market. Eviews 9.0 and 10.0 offers this option.

International Monetary Fund's International Financial Statistics (IFS) while tourist arrivals figures were obtained from the Fiji Bureau of Statistics. Brent crude oil prices were sourced from Bloomberg. PPP conversion factors for private consumption were sourced from the OECD database. Visitor arrivals by source markets for Australia and New Zealand were obtained from the Australian Bureau of Statistics and StatsNZ websites, respectively.

5.0 Empirical Results and Policy Recommendations[14]

The error-correction term of all the eight ARDL selected models were negative and highly significant implying a long run relationship between visitor arrivals and the respective country-related variables (Table 2 Panel A). All the Results of the Bounds Test for Cointegration reject the null hypothesis of no long run relationship (Table 1 Panel B). The explanatory power of all the models were also high ranging from 0.62 to 0.98 (Table 2 Panel C).

Income Elasticities

Table 2_Panel B suggest that seven out of the eight source markets under study are income sensitive markets, with long run elasticities higher than 1, suggesting that change in income levels will lead to more than proportionate increase in visitor arrivals from those markets in the long run. Australia has the highest income coefficient followed by New Zealand and South Korea for the short hauls markets while Canada leads the long haul routes. Similar outcomes were noted in (Narayan, 2002), (Narayan, 2004) and (Katafono & Gounder,

[14]Aggregate models performed better than per capita models in this paper. This is probably due to small country size. Nevertheless, the results are in line with a study to test the better model for forecasting Hong Kong tourism demand by Australia, the UK and the USA residents, (Song , et al., 2010).

2004). These results have important implications for tourism stakeholders in Fiji by showing that a careful study of economic activity and developments is vital to maximise revenue, profits, and tourism earnings and build buffers from these markets, which makes up around three-quarters of total arrivals, during upswings and boom periods.

Price Elasticities

The South Korean, Japanese and Canadian markets are highly sensitive to price developments in Fiji. In addition, visitors from Japan, Canada and EU are likely to opt for Fiji over other substitute competitor destinations if it is cost effective for them to do so. This result is in line with (Schiff & Becken, 2011) who found the Asian market to be more price sensitive in New Zealand. This suggests that Fiji needs to price its tourism products right to remain competitive as a slight increase in prices either structural via tax increases or otherwise can dissuade tourists from visiting Fiji. However, it is unlikely that tourism bodies will price their products differently for different markets thus it is important to strike the right balance between getting an extra dollar and losing tourist arrivals. New Zealand visitors find Fiji as a complementary destination to Australia and not a substitute.

Travel costs were found to be significant but inelastic for the Australian, Japanese and the UK markets.

The geographical price index was negative and elastic for the UK and US markets. This suggests that it is possible that UK and US visitors come to Fiji not for its price attractiveness alone but also to visit New Zealand and Australia. A separate study arrived at a similar conclusion that there is a

symmetric spillover between Australia and New Zealand for UK visitors as tourists who visit Australia tend to visit New Zealand as well and vice versa (Balli & Tsui, 2015). This means that Tourism Fiji and all relevant stakeholders should closely collaborate with New Zealand and Australian tourism bodies so as to attract more UK tourists. Any general rise in price levels among the three countries might hit Fiji the most given its heavy reliance on the tourism industry. A research using a gravity model provided a similar recommendation in that South Korea should collaborate more with China, to attract more tourists (Oh & Zhong, 2016). The degree of openness, in terms of visa free access is also important in attracting more inbound tourists (Yang & Wong, 2011).

Dummies

Natural disasters do have an adverse impact on Australia, New Zealand and EU arrivals. With the increasing effects of climate change, Fiji needs to ensure that there are no barriers to the development of other sectors which may impede diversification of the economy.

The GFC which arguably triggered the 2009 devaluation, has had a long run negative influence on the Australian and South Korean tourism markets.

	Short-haul Markets		Long-haul Markets					
	Australia	**New Zealand**	**Japan**	**South Korea**	**Canada**	**EU**	**UK**	**US**
va(-1)	0.7434***	0.7001***	0.4429***	0.2176*	0.2868**	0.4927***	0.8210***	0.4001***
va(-2)			-0.1491					
yk	-0.4647	-0.2495	-4.6604**	2.2246*	4.7511***	2.3544	0.2734	1.4439
yk(-1)	-0.3911	1.6824*	5.0072***		-5.3665***	-4.7484		-0.2225
yk(-2)	1.3600				3.2687***	4.0306**		3.9142
yk(-3)	-1.1961							-3.3950**
yk(-4)	2.1953							
op	-0.2661*	-0.0659	-2.1830	-2.6665	0.3606			
op(-1)		3.3454**	-0.7922	0.1516	1.1045			
op(-2)		-3.1945**	-0.3384	2.7480	2.2386			
op(-3)			0.2233	-4.3240*	0.3959			
op(-4)			-2.2959**	-2.6248	-5.4960***			
cp		0.6418	5.8993***	0.9770	3.3302	0.9451***		
cp(-1)		-2.5315*			-3.1226			
cp(-2)					-4.7491			
cp(-3)					-0.8605			
cp(-4)					9.4485***			
oil	0.1000*		-0.1554*	0.2836**			0.0649	

oil(-1)	-0.1926***		-0.0291	-0.5896**			-0.1087**	
oil(-2)			0.4063**	0.6391**				
oil(-3)			-0.3631***	-0.3124**				
geo					0.7552		-1.6946***	-1.2388**
geo(-1)					-5.1066**			
geo(-2)					4.6612**			
geo(-3)								
geo(-4)								
coup	-0.0594					-0.1046*	-0.0656	
n/disaster	-0.2031***	-0.3014***		-0.1275		-0.0972**	-0.0052	-0.0299
gfc/2009dev	-0.0758			-0.1561*			-0.0187	
c	-4.0922*	3.0747	-0.1938	19.7401*	-22.4691**	-9.5513***	7.5189***	0.4496
ARDL Bounds Test F-Statistic	5.1392***	4.4488**	9.7438***	7.5815***	7.8120***	7.4111***	7.8341***	6.0549***
Condition for Cointegration met:	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ARDL Model Selected:	(1,4,0,1)	(1,1,2,1)	(2,1,4,0,3)	(1,0,4,0,3)	(1,2,4,4,2)	(1,2,0)	(1,0,1,0)	(1,3,0)
Number of Models Evaluated	500	500	2500	2500	2500	100	500	100

*,**,*** reflects significance at 10 percent, 5 percent and 1 percent levels.

Table 2: ARDL Cointegrating And Long Run Form

Table 2_Panel A: Short run coefficient with VA as dependent variable

	Short-haul				Long-haul			
	Australia	**New Zealand**	**Japan**	**South Korea**	**Canada**	**EU**	**UK**	**US**
Δ(va(-1))			0.1555					
Δ(yk)	-0.7211	-0.2349	-4.6175***	1.1866	4.7511***	1.5303	-0.2974	1.2593
Δ(yk(-1))	-2.6287**				-3.2687***	-3.3318**		-0.4228
Δ(yk(-2))	-0.5331							3.4504**
Δ(yk(-3))	-1.7507							
Δ(op)	-0.5266	-0.1373	-1.6501	-2.0921	0.3606			
Δ(op(-1))		3.2381***	2.4981**	3.9502**	2.8615*			
Δ(op(-2))			2.1570**	6.5161***	5.1001***			
Δ(op(-3))			2.3997**	2.0135	5.4960***			
Δ(cp)		0.7545	4.9441**	0.1280	3.3302	0.6240		
Δ(cp(-1))					-3.8389*			
Δ(cp(-2))					-8.5880***			
Δ(cp(-3))					-9.4485***			

Δ(oil)	0.0821		-0.1541*	0.2976**			0.0755*	
Δ(oil(-1))			-0.0396	-0.4879***				
Δ(oil(-2))			0.3671***	0.3616**				
Δ(geo)					0.7552		-0.5551	-0.4491
Δ(geo(-1))					-4.6612***			
Δ(geo(-2))								
coup	-0.0093					-0.0738**	-0.0816**	
n/disaster	-0.1757***	-0.3222***		-0.1854**		-0.1176***	-0.0164	-0.026564
gfc/2009dev	-0.1531***			-0.2902**			-0.0771*	
cointEq(-1)	**-0.2541*** **	**-0.2529*** **	**-0.7192*** **	**-0.7355*** **	**-0.7132*** **	**-0.5137*** **	**-0.1895*** **	**-0.6258*** **

Table 2_Panel B: Long run coefficients

	Short-haul				Long-haul			
	Australia	New Zealand	Japan	South Korea	Canada	EU	UK	US
yk	5.8603***	4.7784***	0.4910	2.8433*	3.7201***	3.2263***	1.5271*	2.9011***
op	-1.0372	0.2833	-7.6273***	-8.5834***	-1.9579**			
cp		-6.3016**	8.3540***	1.2488	5.6737***	1.8631***		
oil	-0.3610**		-0.2001*	0.0265			-0.2449**	
geo					0.4343		-9.4650***	-2.0649**
coup	-0.2316					-0.2061	-0.3663	
n/disaster	-0.7917**	-1.0052**		-0.1629		-0.1917**	-0.0291	-0.0498
gfc/2009dev	-0.2956*			-0.1995*			-0.1042	
c	-15.9504***	10.2534	-0.2744	25.2301*	-31.5041**	-18.8292***	41.9956***	0.7495

Table 2_Panel C: Diagnostics Tests

1. Serial Correlation LM Test								
- Breusch-Godfrey F Stat (p-value)	0.8809	0.7443	0.7939	0.9021	0.5695	0.8542	0.5093	0.4996
-Condition met:	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2. Heteroskedasticity Test:								
-Breusch-Pagan-Godfrey F Stat (p-value)	0.3255	0.6458	0.3642	0.4756	0.0267	0.8207	0.0426	0.2097
-Condition met:	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3. Ramsey Reset								
F-stat (p-value)	0.0089	0.4618	0.0790	0.0113	0.5192	0.1213	0.2712	0.9707
-Condition met:	No	Yes	Yes	Marginal	Yes	Yes	Yes	Yes
4. Normality								
J-B Stat (p-value)	0.1458	0.0147	0.7416	0.3333	0.7029	0.2995	0.2638	0.0263
-Condition met:	Yes	Marginal	Yes	Yes	Yes	Yes	Yes	Yes

5. Stability

Cusum Test (cumulative sum within the 5% critical lines)

-Condition met:	Yes	Yes		Mostly	Yes	Yes	Yes	No	Yes

6. Goodness of Fit:

R-squared	**0.9804**	**0.9190**		**0.9825**	**0.8735**	**0.9157**	**0.8891**	**0.9865**	**0.6675**
Adj R-squared	**0.9754**	**0.9050**		**0.9770**	**0.8342**	**0.8815**	**0.8748**	**0.9845**	**0.6236**

Diagnostic tests are necessary to ensure the selected models are well specified. Apart from some functional form issues with the Australian model, all models satisfy the conditions that residuals are serially uncorrelated and are homoskedastic (Table 2_Panel C). Most models also passed the tests for specification, normality and stability.

Further Studies

Future studies on tourism arrivals in Fiji can focus on adopting a vector autoregressive modelling technique which has the advantage of generating impulse response functions to show the impact on variables when there is a shock to the key determinants of tourist arrivals from a source market (Song & Witt, n.d.). The results would be useful for Fiji tourism stakeholders as it would allow for better planning.

Recent tourism demand papers have incorporated the role of climate change and have found it to be significant (Song & Shen, 2016). Temperature has been used as the unit of measure while some studies have incorporated a tourism climate index. This can also be explored given the grave concern around climate change in Fiji and its implications for the tourism industry. Other studies can include an investigation into domestic tourism demand as well as the supply side of tourism in Fiji.

Apart from the geographical price index introduced in this paper, there is also a possibility of Fiji gaining through the tourist spill overs on long haul routes from Australia and New Zealand. Balli and Tsui (2015) who used a bivariate GARCH model to investigate spill overs of arrivals between Australia and New Zealand from seven long haul routes found that certain countries have

asymmetric spill overs while others are symmetric. This study could be followed and extended to include Fiji.

Limitations

Fiji is best known for its people and hospitality (Ministry of Industry, Trade and Tourism, 2014), although it cannot be a factor on its own in attracting new tourists. Proxies of such factors are relatively new in the literature but have been significant in explaining arrivals (Song, et al., 2000). The quality of service providers can also be a factor. A proxy can be the number of tourism studies' graduates. However, data constraints limit us from exploring this area. The number of flights to a destination was another variable we considered. Nevertheless, we are of the view that demand for flights creates the need to add additional routes or increase frequency and not supply driving demand.

6.0 Conclusion

The intention of this paper was to ascertain the economic relationships in the tourism demand model for Fiji. The tourism demand for Fiji is measured by visitor arrivals from eight source countries which account for about 85.0 percent of total visitor arrivals to Fiji. The paper made use of the ARDL model to measure elasticities of income and relative prices in tourism demand for Fiji from the source countries.

The results suggest that five of the eight source countries are price sensitive (either own price or competitor's price). This implies that Fiji must monitor its price competitiveness relative to its competitor destinations. It is even more crucial now given developments in technological advancements which make searching and booking for holidays even easier and lets tourists

compare prices and customer reviews. This means that certain policy measures even with the right intentions that result in higher prices of tourist products can be counterproductive for visitor arrivals. Thus, policies need to aim at maintaining Fiji's competitiveness in the tourism sector.

With regards to natural disasters and political instability (short term effect on the EU and the UK markets – see Table 2_Panel A), Fiji must look into expanding its focus beyond the traditional tourism markets towards new source markets that are less vulnerable to the impact of climate change and natural disasters. This may also require a shift in focus towards regional tourism so as to have a more realistic, less exaggerated view of the severity of the situation in the country.

Increased collaboration among stakeholders from various tourism destinations to share the benefits of combined packaged travel on international long haul routes especially for Australia and New Zealand would be advantageous for Fiji. Tri-country partnership between our three countries through multiple-country tour packages can contribute to regional economic development and help the three economies capitalise on their strengths so that they can better promote their respective destinations. This partnership can facilitate access to new knowledge of markets and technologies and may also assist to spread the cost of marketing activities among the destinations in the region.

Moreover, policy makers should keep a close tab on business cycles in the markets of origin. Business cycles in the different tourism source markets may have immediate or delayed effects on tourism flows to Fiji thus would require differentiated policy responses from tourism stakeholders. Strengthened

partnership between the public and private sector and closer monitoring and analysis of changing trends, with necessary early responses will help to maintain tourism competitiveness. Closer source market observations and research for development of flexible and efficient promotional tools, additional marketing activities and an expansion of source markets will help to address crisis management and resilience of destinations. Specifically, a simplification of visa systems along with the reduction of bottlenecks of air access by the provision of more direct flights can be useful to eliminate barriers in accessing additional source markets.

7.0 Appendix

Table 4.0: Foreign Exchange Earnings ($M)

	2001	2016
Tourism	463.9	1823.3
Remittances	187.8	541.8
Mineral Water	24.5	214.4
Fish	93.0	132.5
Gold	85.4	121.0
Sugar	225.2	103.1
Garments	305.2	102.2
Timber	39.6	63.8

Source: Fiji Bureau of Statistics

Table 4.1: Travel & Tourism contribution to GDP & Employment

	2016		2027f	
	F$M	***%of GDP***	***F$M***	***%of GDP***
Direct Contribution to GDP	1292.2	14.5	2354.6	16.9
Total Contribution to GDP	3599.2	40.4	6270.5	44.9
	No. of Jobs	***%of Total Employment***	***No. of Jobs***	***%of Total Employment***
Employment: Direct Contribution	42,500	13	59,000	16.8
Employment: Total Contribution	119,000	36.6	155,000	44.0

Source: Travel & Tourism: Economic Impact 2017 (Fiji)

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