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Investigating other leading indicators influencing Australian domestic tourism demand

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Abstract

In the tourism demand literature, much of the research focuses on income and price variables as demand determinants for travel. Nevertheless, the literature has neglected other possible indicators such as consumers' perceptions of the future course of the economy, household debt and the number of hours worked in paid jobs. In fact, several studies found that these indicators could influence consumers in making decisions to travel. In this paper, we examine whether there are other indicators that can influence future Australian domestic tourism demand. The econometric model used in this study is a panel three-stage least squares (3SLS) model. Using the data on Australian domestic tourism demand, the empirical results reveal several points: first, it is found that the consumer sentiment index has significant impacts on VFR, but not on holiday tourism. Furthermore, the business confidence index has no influence on business tourism demand. The study also finds that an increase in household debt could encourage more Australians to travel domestically, indicating that Australians may consider increasing debt as their confidence to spend increases. Lastly, working hours have a statistically significant effect in the case of holiday tourism data.

Keywords: Consumers sentiment index, household debt, working hours, Australian domestic tourism demand.

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1. Introduction

Leading economic indicators have been widely employed in the economic literature for the purpose of forecasting business activities. The usefulness of leading indicators is that they enable researchers to determine and predict turning points in the cyclical movements of an activity of interest [18]. In the tourism demand literature, it is well acknowledged that income and tourism prices are the leading demand determinants in tourism demand analyses. According to the literature reviewed by Lim [26], out of 124 published papers, income variables were employed in 105 empirical papers. The author also found that 94% of the papers used relative prices whereas 52% used transportation costs.

In addition, other leading indicators have been considered in the literature. For instance, Cho [6] and Turner et al. [34] employed macroeconomic variables, such as the money supply, gross domestic products, the unemployment rate, imports and exports, to examine tourist arrivals to Hong Kong and Australia, respectively. Rossello-Nadal [32] examined monthly tourist growth in the Balearic Islands using the number of constructions, industrial production, foreign trade and exchange rates.

However, there is no conclusion made in the tourism literature about whether these indicators are useful in practice. Rossello-Nadal [32] conducted econometric analysis of monthly tourist growth in the Balearic Islands using several potential leading indicators as independent variables. The study further tested the forecast accuracy of the econometric model against several pure time-series models and found that the former model performed best in turning point forecasts. In contrast, Kulendran and Witt [23] argued that leading indicators do not provide advantages in tourism demand forecasting. They investigated whether using leading economic indicators in a transfer function model can generate better forecasts for tourist arrivals to European countries. By comparing the model with other time-series regressions, they discovered that the transfer function does not outperform a univariate ARIMA model in four- and eight-quarters-ahead forecasts. Turner et al. [34] also found that leading indicators can predict tourist arrivals from New Zealand and the UK to Australia relatively accurately but not for tourists from the USA and Japan. Despite the inconsistent findings, Jones and Chu Te [18] argued that using economic leading indicators in tourism demand analysis is still worthwhile because it provides an advance

warning of the fall in tourist arrivals, and an indication regarding the direction of tourist growth.

There are several indicators which already exist in the economic literature but are largely neglected in tourism demand research, namely consumers' expectations of the future economy, hours worked in a paid job and household debt. Given this, the current paper intends to examine whether these indicators (apart from income and tourism price variables) can influence tourism demand.

1.1 Consumers' expectations of future economy

Consumers' expectations of the future economy play an important role in the decision-making process. According to Katona [19], a consumer's discretionary expenditure not only depends on the ability to buy, but also on his/her willingness to buy. Moreover, changes in the latter are associated with the consumer's attitudes and expectations. This is because the consumer develops anticipations about his/her likely future economy and circumstances, and this becomes a piece of additional information used to decide whether he/she should spend or save now. Accordingly, consumers with optimistic expectations tend to spend more on discretionary goods and services and save less, whereas consumers with pessimistic expectations tend to spend less and save more [35]. In conclusion, Kotana [20] and van Raaij [35] argued that the expectation of a household's personal financial progress and economic situation influences buying decisions, especially for durable goods, vacations and recreation, as well as saving decisions.

To incorporate consumers' expectations in determining and forecasting economic growth, Kotana [20] suggested using a consumer sentiment index (CSI). According to Gelper et al. [13], the basic idea of the CSI is that if consumers are confident about their actual and future economic and financial situations, they would be more willing to increase their consumption. In the economic literature, several empirical studies have concluded that the CSI has considerable predictive power. For instance, Eppright et al. [10] found that the aggregate consumer expectation indices are useful to anticipate changes in US future aggregate consumer expenditures. In fact, they suggested that "...consumers appear to revise their economic outlook and behaviour based on signals which originate in their

economic environment...aggregate consumer expectations were at least as important as economic conditions in determining consumer expenditure levels” (p. 219). Gelper et al. [13] discovered that the CSI can predict US consumers’ spending on services better than durables or non-durables in the long-run. Similarly, Easaw and Heravi [9] revealed that the CSI has some predictive powers in forecasting durable, non-durable and service consumptions the UK.

Similarly, in the cases of business persons or firms, both are more willing to spend on their business activities depending on their views of a country’s likely future economic course. In the international tourism literature, Swarbrooke and Horner [33] argued that the level of economic development and state of the economy can influence the demand for business travel and tourism. Accordingly, a high level of economic development and a strong economy increase demand and vice versa. Similarly, Njegovan [31] asserted that business expectations can be one of the leading indicators that influence the demand for business air travel. The underlying reason is that firms are more likely to authorize travel for conference and business purposes when they feel more confident about the business environment. In conclusion, while the consumer expectations could affect households’ demand for vacations, the level of business confidence could influence individual firms’ demand for business travel.

1.2 Hours worked in paid jobs

In the economic literature, Gratton and Taylor [14] stressed that the allocation of time between work and leisure is driven by individuals’ decision-making. As time is considered as a limited resource, individuals make decisions about whether to spend their time on paid-work or on leisure.

Three empirical papers have examined the relationship between working hours and tourism demand in the tourism literature. Cai and Knutson [5] found that the reduction of weekly working hours in China has provided Chinese families with extra time for domestic pleasure trips and vacations. Similarly, Hultkrantz [16] studied the demand for recreational travel by the Swedish residents and discovered that the working time and demand for leisure is negatively correlated. Kim and Qu [21] investigated the factors that affect domestic Korean tourist expenditure per person and found that the coefficient for the

number of working hours is negative. Therefore, these studies concluded that an increase in working hours will lead to a decline in domestic tourism demand. Nevertheless, in the Australian tourism literature, the effect of increasing working time on Australian domestic tourism demand has not been examined yet.

1.3 Household debt

Rising expenditure particularly household debt repayments, may have effects on the demand for domestic tourism in Australia. The underlying rationale is that Australian consumers have a strong tendency to trade off their discretionary income for repaying debt, rather than for travel. Crouch et al. [7] discovered that most Australian households used 45% of their discretionary income for household debt repayments. Similarly, Dolnicar et al. [8] argued that 53% of the survey respondents in Australia preferred allocating their disposable income to paying off debt, while only 16% of the respondents chose to spend on vacations. Hence, if Australian households have an increasing accumulation of debt, this could lead to a reduction of disposable income available to spend on leisure.

Conversely, Athanasopoulos and Hyndman [1] found that an increase in household debt would not lead to a decline in domestic holiday and business travel in Australia. In fact, the elasticities of one-quarter-lagged debt variables for domestic holiday and business tourism demand were 4.41 and 5.91, respectively. They argued that, as the variable can be considered as a proxy for consumer confidence, an increase in borrowing rates in the previous quarter will result in a rise in domestic travel demand.

1.4 Motivation of this research

This study assesses whether three economic indicators (i.e. the consumer expectations of the future economy, hours worked in paid jobs and household debt) can influence tourism demand for a destination. Based on the literature above, the following assumptions are made: (1) An increase in consumers' optimism about the future economic outlook may lead to a growth in the demand for tourism; (2) The more hours they put into work, the more leisure time will be foregone; (3) For the effects of household debt growth on domestic tourism demand, the expected sign is undetermined as the literature shows an

inconsistency. Hence, this research re-examines this issue and attempts to validate the study conducted by Athanasopoulos and Hyndman [1].

2. Australian domestic tourism markets

For Australian residents, travelling is considered as an important household item. In 2006-2007, Australian households consumed about AUD69 billion in recreation and culture as well as AUD42 billion in hotels, cafes and restaurants. In fact, based on Table 1, travelling and tourism products were ranked in the top five of the highest value of household consumption in Australia. Furthermore, during the same period, Australians spent about AUD52 billion of the Australian produced tourism goods and services, whereas they spent about AUD18 billion of overseas tourism products [3]. The Australian Bureau of Statistics estimated that, in 2006-2007, the average expenditure on domestic trips is AUD295, which is lower than the average expenditure on outbound trips (AUD4968). Nevertheless, domestic tourism still plays an important role in the industry because domestic visitors consumed 73.7% of the Australian tourism products whereas international visitors (which are comprised of inbound and outbound visitors) consumed 26.3%. Hence, this indicates that most Australians travelled domestically more than overseas.

[Insert Table 1]

In Australia, domestic tourists can be segmented into domestic overnight and day visitors. According to Tourism Research Australia, a domestic overnight visitor is a person who stays one or more nights in one or several destinations during his/her domestic trips, whereas a domestic day visitor is referred to as the person who travels for a round trip distance of at least 50 kilometres and does not spend a night during the trip. Each group of tourists can be further segregated into four different purposes of travel; namely holidays, visiting friends and relatives, business and other. Due to space limitation, this paper focuses on three main groups of domestic overnight visitors, namely holiday-makers, visitors who visited friends and relatives (VFR) and business travellers.

Table 2 reveals that most of the domestic overnight visitors travelled for the purposes of a holiday. In 2008, they stayed approximately 142 million nights for holidays and, on average, each domestic overnight holiday-maker spent AUD175.43 per night (Table 3).

Despite that there was a decline of 6.3% in the number of domestic holiday visitor nights in 2006, the trend reversed as there was a 9.5% increase in 2007. However, compared with domestic business tourists, the average expenditure per night by a holiday-maker was about 10% to 36% lower than the average amount spent by a business traveller.

Tourists who are visiting friends and relatives (VFR) have emerged as a major tourism market in Australia. Moscardo et al. [29] found that, apart from visiting friends and relatives, VFR tourists also engaged in activities such as sightseeing or day-trips, visiting nature destinations, and water-sports. In fact, they discovered that the majority of VFR tourists were domestic tourists. Based on Table 2, this type of tourist ranked second in terms of the most nights stayed (i.e. 86 million nights in 2008). Nevertheless, the number of nights spent by VFR tourists has decreased significantly in 2006 and 2008. Furthermore, the average expenditure per VFR tourist was relatively low (i.e. AUD107 in 2008) compared to domestic overnight holiday-makers (AUD175) and business travellers (AUD199).

Domestic business tourism in Australia has done relatively well since 2006. The numbers of nights stayed in 2007 and 2008 have increased by 3.76% and 3.48%, respectively. Furthermore, on average, each business traveller spent between AUD187 and AUD209 per night, which surpassed the average expenditure for holiday-makers and VFR (Table 3).

[Insert Table 2]

[Insert Table 3]

3. Model, estimation procedure and data

This paper investigates the existence of the relationships between domestic tourism demand and the above-mentioned indicators. With respect to this, a model of domestic tourism demand is constructed as follows:

$$TD_{jt} = f(Y_{jt}, TP_{jt}, DUM_{jt}, ConExp_{jt}, DEBT_{jt}, WOR_{jt}) \quad (1)$$

where Y = domestic household income, TP = tourism prices, DUM = dummy variable for one-off events (such as Bali bombings in 2005 and Sydney Olympic Games in 2000) and

seasonality. The model is developed for three purposes. First, we can estimate the income and tourism price elasticities, and determine whether one-off events and seasonality have any impacts on the demand. Second, the model can be used to examine whether the consumers' perceptions, household debt and number of worked hours in paid jobs influence Australian domestic tourism demand. Lastly, it is of interest to assess whether these three variables should be included or excluded from equation 1.

With regard to estimation, a panel data approach is employed in this paper. The underlying reason is that the time-series sample size is small, which ranges from quarter one of 1999 to quarter four of 2007 (approximately 36 time-series observations). Therefore, using panel data models is advantageous because such data gives more information, more variability, less collinearity amongst the variables, more degrees of freedom and more efficiency [4].

This study uses a dynamic panel model. The benefit of such a model is that it contains a lagged dependent variable which can be used to measure tourists' habit persistency. To illustrate the point, the panel data with serial correlation model is as follows:

$$y_{jt} = c + v'_{jt} \delta + \alpha_j + \varepsilon_{jt},$$

$$\varepsilon_{jt} = \rho \varepsilon_{j,t-1} + \eta_{jt}, \quad (2)$$

$|\rho| < 1$ and η_{jt} are independent and identically distributed.

where:

- y_{jt} = demand for domestic tourism in State j
- c = a common constant term
- v = a vector of explanatory variables.
- t = time subscript.
- α_j = individual-specific effect of each State j
- δ = a coefficient matrix
- ε = error term.

Equation (2) can be re-written as:

$$y_{jt} = c(1 - \rho) + \rho y_{jt-1} + (v_{jt} - \rho v_{jt-1})' \delta + \alpha_j (1 - \rho) + \eta_{jt} \quad (3)$$

Or

$$y_{jt} = c^* + \rho y_{jt-1} + v_{jt}^* \delta + \alpha_j^* + \eta_{jt}, \text{ where } c^* = c(1 - \rho), v_{jt}^* = v_{jt} - \rho v_{jt-1} \text{ and } \alpha_j^* = \alpha_j (1 - \rho)$$

All coefficients in equation (3) have become more consistent and efficient. Nevertheless, estimating equation (3) using least squares is problematic because the lagged dependent variable is correlated with the disturbance, even if η_{jt} is not serially correlated. Hence, to overcome this issue, the most appropriate estimation method is to employ the instrumental variables techniques. Nevertheless, the necessary condition is that the instrumental variables (denoted as Z_{jt}) must be strictly exogenous, $E(\eta_{jt}/Z_{jt}) = 0$ for all t .

For this paper, a panel 3SLS model is considered. The advantage of using this model is that it takes accounts both of heteroscedasticity and contemporary correlation in the residuals when some of the right-hand side variables are correlated with the error terms. To put it differently, the 3SLS model is the two-stage least squares version of the seemingly unrelated (SUR) method [25].

This paper also includes a unit root test for dynamic panels, which is developed by Harris and Tzavalis [15]. They introduced asymptotic unit root tests where the residuals follow an AR(1) and the time dimension is fixed. The test derived is based on the normalised least squares estimators of the autoregressive coefficient and allows for fixed effects and individual deterministic trends [15]. The authors considered three data generating processes (DGP). One of them is written as follows:

$$\log y_{it} = \omega_i + \rho \log y_{it-1} + u_{it} \quad (4)$$

where y_{it} = some relevant variable, ω and ρ are parameters, and $u_{it} \approx N(0, \sigma_u^2)$. The null hypothesis is the existence of a unit root in equation 4 (i.e. $\rho = 1$) and the alternative hypothesis is that the AR(1) process is stationary, i.e. $|\rho| < 1$. The model is a unit root process with heterogeneous drift parameters under the null hypothesis, and a stationary

process with heterogeneous intercepts under the alternative hypothesis. The normalised distribution of the statistic is:

$$\sqrt{N}(\hat{\beta} - \mathbf{1} - \mathbf{B}) \xrightarrow{L} N(\mathbf{0}, \mathbf{C})$$

where $\mathbf{B} = -\mathbf{3}(\mathbf{T} + \mathbf{1})^{-1}$,

$$\mathbf{C} = \mathbf{3}(17\mathbf{T}^2 - 20\mathbf{T} + 17)(5(\mathbf{T} - \mathbf{1})(\mathbf{T} + \mathbf{1})^3)^{-1}$$

For the dependent variables, we use three types of data on Australian domestic tourism demand, namely the numbers of visitor nights by holiday-makers (HOL), business visitor nights (BUS), and visitors of friends and relatives (VFR). For the independent variables, three types of proxy variables are used for the household income variable, namely disposable income (DI), gross domestic products (GDP), and gross domestic product per capita (GDPP). As for tourism prices, the CPI of domestic travel (DT) is used as the proxy. This study also uses the consumer sentiment index (CSI) to evaluate the impacts of consumers' perceptions of future economy on HOL and VFR tourism demand, as well as the business confidence index (BCI) for business tourism demand analysis. For the household debt proxy, the ratio of interest repayment-to-disposable income is considered. Lastly, for working hours, the proxy variable is the average actual worked hours in Australia. This data is quarterly data from 1999 to 2007. Furthermore, first differenced data is used in this study. According to Garin-Munoz [11], by differencing data and removing the problem of non-stationarity, panel data analysis will give us confidence in the reported coefficients and standard errors. Furthermore, for instrumental variables, two- and three-lagged dependent variables are used. The above variables can be obtained from the Australian Bureau of Statistics, the Reserve Bank of Australia and Tourism Research Australia.

4. Empirical results

When modelling the impacts of consumers' future economy expectations on domestic tourism demand, this study finds that the CSI coefficient for the VFR data is statistically significant at a 5% level (Table 4) but not for the holiday data. This implies that VFR visitors are sensitive to changes in Australia's economic outlook whilst holiday tourists are

not. For the case of business tourism demand, the coefficient for BCI is found to be insignificant.

[Insert Table 4]

In addition, the impacts of household debt on holiday and VFR visitors are evident, except business tourism. Accordingly, the estimated elasticities for both groups of visitors are 2.39 and 2.90, respectively, implying that an increase in debt does not lead to a fall in demand for domestic holiday and VFR trips. The underlying reason is that Australians may incur more personal debt (such as credit cards and personal loans) to finance their domestic trips. However, Table 4 reveals that household debt has no significant effect on business visitors. The result seems reasonable because most of the business trips are funded by companies and hence, household debt may not have strong influence on business visitors' decisions to travel. Overall, the results concur with the findings in Athnansopoulos and Hyndman's study for the holiday case, but not for the business and VFR tourism.

The results also reveal that WOR coefficients do not have a strong influence on Australian domestic tourism demand, except for holiday tourism. However, the coefficient sign is positive¹ which is not consistent with the prior expectation. A possible reason is that, given the availability of modern technologies (such as laptops, wireless internet and 3G mobile network), Australians may be able to spend time on domestic holidays and work at the same time (if required). In addition, as the working hour data can be directly related to the opening hours for shops in Australia², the coefficient may indicate that domestic tourists would spend more time on travel when business operating hours in Australia increase.

Income and tourism price variables have significant impacts on Australian domestic tourism demand. In fact, the coefficient signs for these variables are consistent with the prior expectations. The only exception is the disposable income estimate for VFR tourism demand (-2.01). This may indicate that, as the disposable income increases, Australians would tend to forego domestic trips and choose to travel overseas. For BUS tourism demand, we have explored using various types of income proxy variables, such as GDP,

¹ We also found that the correlation between working hour and holiday data is 0.328.

² The data on average opening business hours is not available. Hence, we consider working hours as the proxy for tourism business operating hours.

GDP(-1), GDPP, and GDPP(-1). Nevertheless, the study found that only GDP and GDPP(-1) variables are statistically significant, but not for GDP(-1) and GDPP. Hence, to avoid multicollinearity, we omitted GDP(-1) and GDPP in this paper (More detail results can be obtained upon request).

Furthermore, the coefficients for lagged dependent variables are statistically significant at the 1% level. However, the sign of the estimates is negative, which may indicate that Australians travel domestically on a periodic basis. One difficulty with our data is that it is the result of periodic samples and the travellers involved are representative, but not the same individuals. The data does not inform us about the travel history of individual travellers.

Similarly, the seasonal dummy variables are found to be statistically significant for HOL and VFR tourism data. This implies that domestic holiday tourists tend to travel by seasons, particularly during school holidays in January and July.

In terms of model specification, the F-statistics reject the null hypothesis that all coefficients are jointly zero, indicating the significance of the model. Furthermore, the Harris and Tzavalis [15] test reject the null hypothesis of a unit root in a dynamic panel ($\rho=1$), proving that $Y_{j,t-1}$ follows a stationary autoregressive process.

4. Limitations

There are three limitations in the paper. First, using a panel data approach encountered problems of estimating long-run coefficients. The underlying reason is that the first-differenced panel data was used, in which the short-run coefficients can be generated but not the long-run coefficients. Moreover, because there was a mixture of I(1) and I(0) variables³, using panel cointegration analysis may not be possible because it is required that all variables have the same level of integration.

³ We found that the IPS test [17] rejects the null hypothesis for the HOL, BUS, VFR, DI and DT level data, indicating that these variables are stationary in panels. In contrast, the test does not reject the null hypothesis for the GDP and GDPP level data. After taking first-differencing on all variables, all independent variables become stationary. Overall, this concludes that the panel data for GDP and GDPP variables are I(1), whereas the panel data for HOL, BUS, VFR, DI and DT are I(0).

Second, an analysis of tourism marketing expenditure impacts on Australian domestic tourism demand has been omitted from this present study. In Kulendran and Divisekera's [22] research, they found that marketing expenditure has an effect on international tourist arrivals to Australia. However, this variable has been excluded from this current study because such data is only available on an annual basis.

Third, this paper focused only on studying the effects of domestic travel prices on domestic tourism demand, and hence, it does not examine whether changes in overseas travel prices could influence Australians to substitute domestic travel for foreign trips. In other words, this research has excluded the investigation of whether changes in exchange rates have an influence on Australians' decisions to travel domestically or overseas.

5. Conclusions and future directions

This paper investigated the existence of relationships between domestic tourism demand and other related factors (namely, household debt, consumers' expectations of the future economy and working hours). Using a panel data dynamic model, the empirical results revealed that these factors do have impacts on the demand.

This paper proposes several suggestions for future studies.

First, the present research found a positive relationship between domestic holiday tourism demand and working hours. The rationale is not obvious, perhaps, that Australians may tend to work while holidaying in Australia or they are more inclined to take their holiday entitlements. Nevertheless, the current findings need more empirical investigation in the future. In fact, it might be worthwhile to conduct a survey of how working people in Australia allocate their time in paid jobs and in leisure. Is there any overlapping between time for work and time for leisure?

Second, in this current study, we employed GDP and GDPP as the proxies to investigate whether Australia's economic performance can influence domestic tourism demand. Nevertheless, it does not explore whether each Australian State's economic conditions

could affect the demand. This issue is a worthy one suitable for conducting further research because, as a state becomes wealthier, the government would invest more money in improving infrastructure facilities which could encourage more tourism businesses within the state. In other words, a state's economic growth might make positive contributions to domestic tourism demand. Hence, to enrich the current study, it would be worthwhile to use gross state product (GSP) to examine whether a state's income growth can promote its domestic tourism demand.

Furthermore, apart from household income and tourism prices, the total volume of visitors between State i and State j could also be determined by the distance between two States and the business environment. For instance, domestic visitors may travel from Sydney to Melbourne more frequently than to Perth for two possible reasons. First, the travelling distance between Sydney to Melbourne is shorter compared to Perth. Second, Sydney and Melbourne have a common business environment as most of the major international companies are based in these two cities. Hence, the future research could employ a panel gravity model to explore whether these two determinants can influence domestic tourism demand in Australia.

We found that several papers [11, 12, 27, 30] have used the Arellano and Bond generalised methods of moments (GMM) procedure to generate dynamic panel estimations. The benefit of the method is that, by taking the first difference transformation, it eliminates the individual effects and treats the dependent variable lagged two or more periods as instruments for the lagged dependent variable [24]. Given this, it would be useful to replicate this current research using the GMM method in the future.

Overall, the income and tourism price variables are still the important determinants of Australian domestic tourism demand. However, to a certain extent, other variables such as the consumer sentiment index, household debt and working hours can play an important role in influencing Australians' decisions to travel domestically. Nevertheless, the research is still in its early stage of investigation. Therefore, it needs more empirical study to validate the usefulness of these factors in modelling domestic tourism demand in other countries.

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