REGIONAL VARIATIONS IN TOURIST CONSUMPTION PATTERNS: A MODEL OF DEMAND FOR DOMESTIC TOURISM IN AUSTRALIA

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INTRODUCTION

- The tourism is a major contributor to Australia's economy, accounting for $90.7 billion or 6% of GDP (TRA, ABS 2014)

- A major contributor to employment, the sector employed 929,000 persons (direct and indirect) accounting for 8.0% of total employment. (TRA,2014)

- Domestic tourism is the major driver of the national tourism sector accounting for 74 per cent of total tourist expenditure (of $110 billion) and 73% of tourism GDP (ABS 2013, TRA 2014). In 2014 (year ending Jun 2014)

- 79.1 million overnight visitors

- 295 million visitor nights

- $53.3 billon overnight spend

- Australians travel for different purposes, of which leisure is the main purpose, accounting for 81% of total leisure expenditure and 84% of all visitor nights
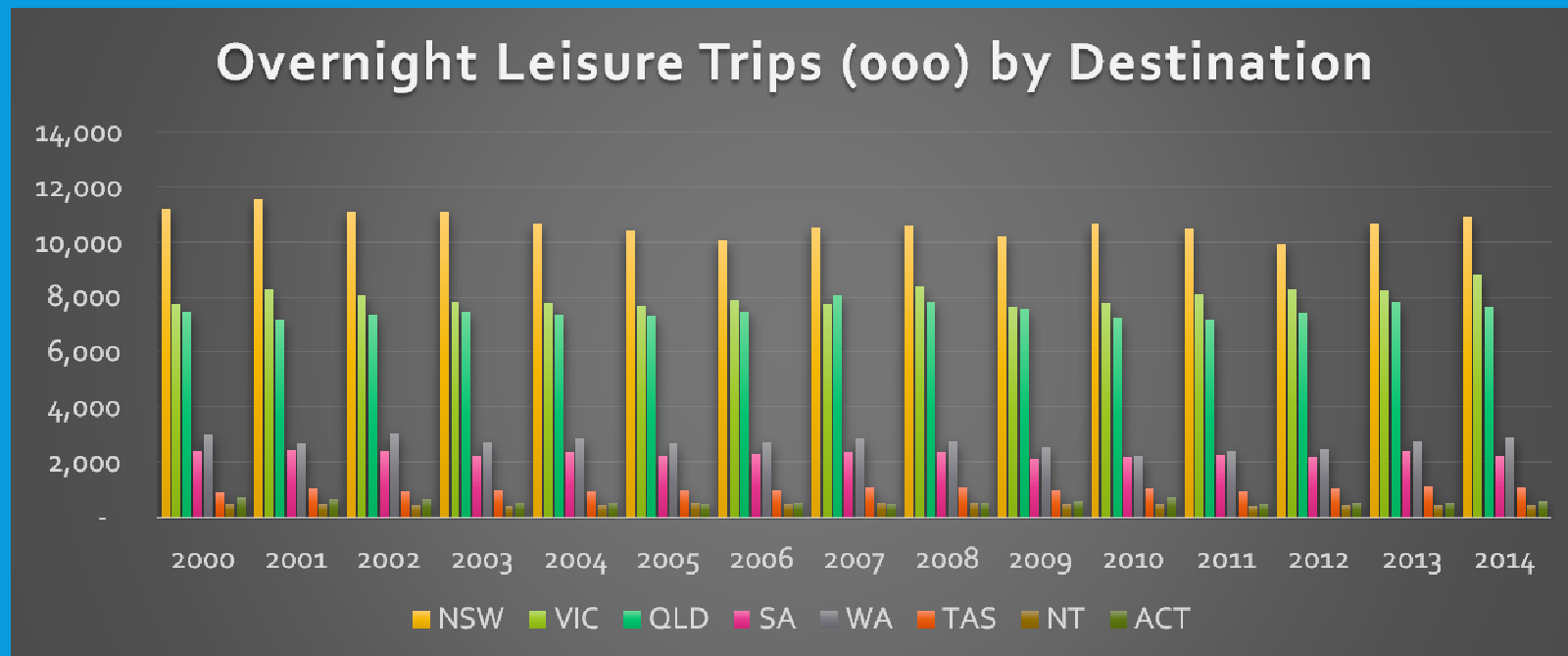
DOMESTIC TOURISM IN AUSTRALIA: AN OVERVIEW

An important characteristic of the Australian landscape is its size and the diversity of the land with varied natural and man made attributes offering a wide range of leisure activities for the wanderlust Traveller.

Further, the concentration of the Australian population geographically into eight divisions of states and territories (regions) adds an additional dimension to domestic tourism - interstate and intrastate tourism.

CHARACTERISTICS OF DOMESTIC TOURIST DEMAND: REGIONAL FACTORS

- Among the different geo-political regions, New South Wales is the premier tourist destination, followed by Victoria , Queensland , Western Australia , South Australia, Tasmania, the Northern Territory , and the Australian Capital Territory.

- This pattern remained consistent over the 2000–2014 period, overnight leisure trips by destination are graphed.

Overnight Leisure Trips (000) by Destination

AN OVERVIEW OF DOMESTIC TOURIST MARKET

- The three states of NSW, VIC, and QLD dominate the domestic leisure tourism market, over 80 per cent of total trips in 2013.

- As NSW is the premier destination for local tourists, it is also the largest generator/origin of domestic tourists (see Table next).

- In 2013, NSW residents undertook nearly 11 million overnight leisure trips followed by Victorians (9), Queenslanders (8), Western Australians (3) and South Australians (2).

- As with tourism spending, the largest demand comes from the two states of QLD and NSW, which account for over 58 per cent of total tourists' spending, followed by VIC (22 %), WA (11 %), and SA (6 %)

AN OVERVIEW OF AUSTRALIAN DOMESTIC LEISURE TOURISM (2013)

Table 1: An Overview of Australian Domestic Leisure Tourism (2013)								
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
Leisure Trips	10897	8823	7625	2213	2909	1079	431	595
Trips: Intrastate	70.90%	80.20%	62.30%	72.20%	87.00%	52.70%	30.90%	0.80%
Trips: Interstate	29.10%	19.80%	37.70%	27.80%	13.00%	47.30%	69.10%	99.20%
Leisure Nights	38556	30009	34519	8070	12939	4596	2176	1445
Nights: Intrastate	64.40%	72.80%	43.80%	59.20%	74.20%	29.60%	11.60%	0.90%
Nights: Interstate	35.60%	27.20%	56.20%	40.80%	25.80%	70.40%	88.40%	99.10%
Average stay (nights)	3.54	3.4	4.53	3.65	4.45	4.26	5.05	2.43
Expenditure	$6,168,960	$4,921,476	$5,799,192	$1,444,530	$2,406,654	$877,836	$552,704	$332,350
Expenditure Shares	27.4%	21.9%	25.8%	6.4%	10.7%	3.9%	2.5%	1.5%
Expenditure per trip	$566	$558	$761	$653	$827	$814	$1,282	$559
Expenditure per night	$160	$164	$168	$179	$186	$191	$254	$230

RATIONALE AND OBJECTIVES OF THE STUDY

- Domestic tourism is a major contributor to regional development and has emerged as an important economic growth strategy for all eight states and territories.

- These reflected in the aggressive promotional strategies being adopted by the states to lure tourists and the renewed interest among policy circles aimed at developing policy strategies to maximize gains from tourism.

- Economic benefits flowing from tourism depend primarily on the level of expenditure incurred by tourists.

- The level of expenditure depends on tourist's consumption patterns and preferences of tourists

- Our objective is to explore this process in some details. We intend to achieve this objective by estimating a tourist expenditure allocation model in a preference consistent utility-maximizing framework based on neoclassical theory of consumer choice.

CONCEPTUAL FRAMEWORK & THE MODEL

- We begin with assuming that a representative tourist chooses a destination to maximise utility.

- Utility stems from destinational attributes, such as pleasant climate, beautiful scenery, and/or participating in various economic, socio-cultural events and features.

- These attributes are consumed jointly with other goods and services – henceforth tourism goods and services- available at the destination.

- All the activities of tourists engaged aimed at maximising utility are defined as tourism.

- The tourist's utility function, representing the preferences for consuming tourism and other goods and services, is assumed to be *weakly separable*.

CONCEPTUAL FRAMEWORK & THE MODEL

- The tourist's utility function is given by an expenditure function, *c (u, p)* which defines the minimum expenditure necessary to attain a specific utility, *u,* at given prices, *p*.

- The particular functional form used in this study to approximate the expenditure function is the one proposed by Deaton and Muellbauer (1980), known as the Almost Ideal Demand System (AI). The AI demand functions in budget share form is given by.

$$w_i = \alpha_i + \sum_j \gamma_{ij} \log p_j + \beta_i \log(X/P)$$

Where P is nonlinear price index given by:

$$\log P = \alpha_0 + \sum_i \alpha_i \log p_i + 1/2 \sum_i \sum_j \gamma_{ij} \log p_i \log p_j$$

Conceptual Framework & the Model

- The model specified above attempts to explain the allocation of tourist expenditure (demand) among various goods and services in terms of relative prices and real expenditure.

- The expenditure measures the level of consumption (the demand in general) by the tourists. The chosen measure of demand used in this study is the number of tourist nights. This measure, in the absence of actual quantities of goods and services consumed (purchased) by tourists, may be considered as the most appropriate measure of tourist demand as the level of consumption depends primarily on the duration of stay.

- Tourists usually consume a bundle of goods and services while on tour and the key elements of such a consumption bundle may be identified under five broad commodity aggregates: Accommodation, Food, Transportation, Shopping and Entertainment/ recreation.

VARIABLE SPECIFICATION

Commodity aggregates

Major Commodity Aggregates	NVS commodities (expenditure items)
Food	Take-away and restaurant meals; alcohol, drinks, groceries for self-catering
Accommodation	Accommodation
Transportation	Taxi fares, airfares, car hire, fuel, long-distance transport, other local transport
Shopping	Shopping, gifts, souvenirs, other
Entertainment	Entertainment, museums, movies, package tours, organised tours, gambling

Data and Commodity Aggregation

- The key source of data are is obtained from the NVS

- These surveys provide itemised expenditure on 20 goods and services.

- These are aggregated into five broad commodity aggregates

- The related expenditures used to estimate expenditure shares

EXPENDITURE/BUDGET SHARES (W$_i$)

	NSW	VIC	QLD	SA	WA	TAS	ACT	NT
Food	28%	30%	28%	27%	28%	25%	28%	23%
Lodging	28%	26%	27%	23%	23%	20%	27%	16%
Transport	17%	20%	18%	22%	24%	24%	19%	29%
Shopping	13%	12%	15%	15%	15%	19%	15%	22%
Entertainment	13%	12%	10%	12%	10%	11%	9%	9%

VARIABLE SPECIFICATION & DATA

- Prices: The lack of and the difficulties associated with measuring actual quantities of goods and services consumed by tourists leads to another problem, measurement of actual prices faced/paid by tourists. The approach used here is to use average spending per night as the proxy for relevant prices (Divisekera, 1995, 2003, 2007).

- While this price definition is consistent with the chosen measure of tourist demand, it may not adequately capture the effects of prices on the level of tourist consumption.

- This is because an increase/decrease in average spending per night may not necessarily be an indication of an increase/decrease in the level of consumption if there are, for example, substantial inflationary pressures. This is particularly the case where consumption is measured over time, i.e., using time series data as in the case of the current study. Therefore, to counter this problem, average spending per night of each broad commodity group was deflated using appropriate price indices.

MODEL ESTIMATION & ECONOMETRIC PROCEDURES

- The data used for model estimation refer to overnight leisure trips by Australians, and the sample consists of quarterly expenditure data from 2000:1 to 2013:4.

- We use seasonal trigonometric variables to account for seasonality.

- $W_i = \alpha_i + \sum_{i=1}^{n} \gamma_{ij} \log p_j + \beta_i \log (X/P) + \theta_i^c \cos \frac{2\pi t}{4} + \theta_i^s \sin \frac{2\pi t}{4} + \theta_i^t . t$

- Two models are estimated -1. Aggregate consumption model. In this version dummy variables that modify the intercept and intend to capture heterogeneity in the range of tourism goods and services consumed by tourists from different states and territories were included in the empirical model.

- 2. Regional Models: Model specified on 1.1 above was estimated for each of the eight regions.

- The two basic theoretical restrictions, homogeneity and symmetry, were imposed prior to the estimation

Table 3: Parameter Estimates: National Demand Model with State/Territory Dummy Variables

Parameters	Equations									
	FOOD (1)		ACCOM (2)		TRANS (3)		SHOP (4)		ENTER (5)	
α_i	0.622	[.000]	-0.101	[.006]	-0.123	[.001]	0.504	[.000]	0.098	[.025]
γ_{ij}	0.144	[.000]								
γ_{ij}	-0.017	[.002]	0.107	[.000]						
γ_{ij}	-0.022	[.000]	-0.042	[.000]	0.112	[.000]				
γ_{ij}	-0.046	[.000]	-0.033	[.000]	-0.038	[.000]	0.129	[.000]		
γ_{ij}	-0.058	[.000]	-0.015	[.000]	-0.010	[.013]	-0.012	[.001]	0.096	[.000]
β_i	-0.075	[.000]	0.022	[.007]	0.034	[.000]	-0.024	[.000]	0.044	[.000]
δ_i NSW	0.197	[.000]	0.116	[.000]	0.128	[.000]	-0.200	[.000]	-0.242	[.000]
δ_i VIC	0.148	[.000]	0.067	[.000]	0.092	[.000]	-0.140	[.000]	-0.167	[.000]
δ_i QLD	0.087	[.000]	0.063	[.000]	0.044	[.000]	-0.088	[.000]	-0.131	[.000]
δ_i SA	0.031	[.000]	0.018	[.000]	0.018	[.000]	-0.031	[.000]	-0.036	[.000]
δ_i WA	-0.019	[.000]	-0.010	[.029]	-0.020	[.000]	0.023	[.000]	0.026	[.000]
δ_i TAS	-0.093	[.000]	-0.065	[.000]	-0.034	[.001]	0.081	[.000]	0.111	[.000]
δ_i ACT	-0.197	[.000]	-0.082	[.000]	-0.157	[.000]	0.189	[.000]	0.246	[.000]
δ_i NT	-0.155	[.000]	-0.107	[.000]	-0.072	[.000]	0.166	[.000]	0.169	[.000]
θ_l^c	-0.002	[.118]	0.002	[.228]	-0.006	[.000]	0.003	[.061]	-0.003	[.061]
θ_i^s	0.015	[.000]	-0.001	[.408]	-0.003	[.064]	-0.005	[.001]	0.005	[.001]
θ_l^t	0.001	[.000]	0.000	[.000]	0.001	[.000]	-0.001	[.000]	0.001	[.000]
W_i	0.272		0.237		0.216		0.158		0.108	

EMPIRICAL RESULTS: AGGREGATE MODEL

- Coefficients associated with the dummy state variables that can be used to evaluate the significance of the 'state of origin' as a determinant of aggregate demand.

- The origin effect, as reflected in the parameter estimates of state and territory dummy variables, varies across the nation reflecting the diversity of preferences for tourism by tourists from different regions.

- The positive coefficients imply that tourists from the respective regions effectively raise aggregate demand for food, accommodation, and transportation.

- That is, an increase in tourist numbers from NSW (as well as from VIC, QLD, and SA), *ceteris paribus*, will raise aggregate demand for the commodities in question.

- These differing outcomes may reflect the variations in preferences and consumption patterns of tourists from different regions

	FOOD	ACCO	TRAN	SHOP	ENTER	Elasticity
Marshallian 'Own' and 'Cross-price' elasticities					**Expenditure**	
FOOD	**-0.259**	-0.143	-0.222	-0.173	-0.854	0.724
	[.000]	[.000]	[.001]	[.000]	[.000]	[.000]
ACCO	-0.038	**-0.557**	-0.210	-0.192	-0.176	1.091
	[.000]	**[.069]**	[.000]	[.002]	[.000]	[.000]
TRAN	-0.083	-0.177	**-0.479**	-0.242	-0.093	1.158
	[.000]	[.000]	**[.000]**	[.108]	[.000]	[.000]
SHOP	-0.081	-0.167	-0.227	**-0.135**	-0.244	0.845
	[.000]	[.000]	[.000]	**[.001]**	[.690]	[.000]
ENTER	-0.265	-0.046	-0.020	-0.105	**-0.036**	1.406
	[.026]	[.390]	[.002]	[.002]	**[.000]**	[.000]

DEMAND ELASTICITIES

- All of the key elasticities—own-price and expenditure/income—are highly statistically significant and have the expected theoretical signs; income elasticities are positive, and own-price elasticities (diagonal elements of the elasticity matrix) are negative, implying that all commodities are normal goods

- Ranking of income elasticities indicates that tourists' demand for Entertainment is the most income-elastic (with a coefficient of 1.4), followed by Transportation (1.15), Accommodation (1.1), and Shopping (0.8); the least elastic is the demand for Food (0.7).

- With elasticity greater than unity, an increase in the tourist budget will increase the demand for Entertainment, Transport and Accommodation, while the demand for Food and Shopping will rise less than proportionately.

- Thus, tourists perceive the three commodity aggregates of Entertainment, Transport and Accommodation as luxuries, whereas Food and Shopping are normal goods.

AGGREGATE PRICE ELASTICITIES

- Own-price elasticities associated with each commodity aggregate are negative and less than unity in absolute value, implying that tourists' demands for the various goods and services are price-inelastic.

- Overall, demand for Accommodation is relatively the most price-elastic (-0.6), followed by Transportation (-0.5), Food (-0.3), Shopping (-0.13), and Entertainment (-0.03).

- Relatively, price-inelastic demand revealed for the five commodity aggregates indicates that tourists perceive these five commodity aggregates as necessities.

- Among the estimated elasticities, the elasticity of demand for accommodation is of particular importance, as it serves as an indicator of consumer preferences for domestic tourism, given that the unit of measurement of demand is tourist nights.

AGGREGATE DEMAND ELASTICITIES

- Relatively elastic demand (1.1) for Accommodation indicates that increases in a tourist's budget or income lead to a more than proportionate increase in the demand for domestic tourism.

- Moreover, we observe that the price elasticity of demand for Accommodation is also the highest among all of the commodity aggregates.

- This, coupled with income-elastic demand would suggest that household income and prices have a significant effect on the accommodation sector and, by inference, on the demand for domestic tourism.

- In relation to Transportation, the second most important commodity that facilitates domestic tourism reveals an income-elastic demand. This would suggest that a rising tourist budget leads tourists to spend more time away from home to travel to various destinations.

CROSS-PRICE ELASTICITIES

- The consumption behaviour of tourists is better understood by examining how they respond to changes in the price of a particular commodity and the resulting change in the demand for other commodities in the bundle.

- These relationships can be evaluated using the cross-price elasticities of tourists associated with their consumption bundle—the off-diagonal elements of the elasticity matrix.

- For example with uncompensated own-price elasticity of -0.26, an increase in food prices reduces the demand for food as well as the demand for other commodity aggregates, as indicated by negative cross-price elasticities (row FOOD).

- All of the cross-price elasticities associated with the commodity aggregates are negative implying that commodities in the tourist consumption bundle are complementary—an increase (fall) in the price of one commodity leads to fall (rise) in the demand for all of the commodity pairs.

COMPARISON OF REGIONAL DEMAND ELASTICITIES

Table 5: Comparison of Regional Demand Elasticities: Price Elasticities									
Commodities	NSW	VIC	QLD	WA	SA	TAS	ACT	NT	NATIONAL
Food	-0.54	-0.70	-0.33	-0.43	-0.32	-0.60	-0.46	-0.41	-0.26
	[.000]	[.000]	[.001]	[.000]	[.007]	[.000]	[.000]	[.000]	[.000]
Accommodation	-0.34	-0.61	-0.45	-0.51	-0.45	-0.71	-0.49	-0.30	-0.56
	[.000]	[.000]	[.000]	[.000]	[.000]	[.000]	[.000]	[.000]	[.069]
Transport	-0.43	-0.82	-0.33	-0.35	-0.10	-0.37	-0.37	-0.56	-0.48
	[.000]	[.000]	[.000]	[.000]	[.058]	[.000]	[.000]	[.000]	[.000]
Shopping	-0.28	-0.27	-0.20	-0.30	-0.14	-0.41	-0.32	-0.22	-0.13
	[.003]	[.001]	[.004]	[.000]	[.015]	[.000]	[.000]	[.000]	[.001]
Entertainment	-0.12	-0.09	-0.27	-0.24	-0.30	-0.23	-0.15	-0.12	-0.04
	[.273]	[.229]	[.000]	[.014]	[.000]	[.021]	[.108]	[.084]	[.000]

REGIONAL DEMAND ELASTICITIES

- Own price elasticities reveal relatively price inelastic demands for the five commodity aggregates across the regions and are less than unity in absolute value implying that tourists demand for various goods and services are price inelastic.

- Demand for Accommodation is relatively the most price-elastic (-0.6), followed by Transportation (-0.5), Food (-0.3), Shopping (-0.13), and Entertainment (-0.03).

- Among the estimated elasticities, the elasticity of demand for accommodation is of particular importance, as it serves as an indicator of consumer preferences for domestic tourism, given that the unit of measurement of demand is tourist nights.

EMPIRICAL RESULTS: PRICE ELASTICITIES

- Magnitudes of price elasticities of demand for **Food** reveal significant variations among the eight states and territories ranging from -0.32 to -0.7. The tourists most sensitive to prices are seen in the demand by VIC (with an elasticity of -0.7), followed by TAS; the least sensitive are NSW and NT tourists.

- In relation to **Accommodation**, demands are quite price-inelastic and closer to the national average, with the exception of the demand from TAS.

- In the **Transport** category VIC tourists are the most sensitive to prices followed by the NT, and the least sensitive are those from SA.

- The demands for **Shopping** and **Entertainment** are quite price-inelastic, and regional elasticities are above the national average.

- Overall, price elasticities of demand for the commodity aggregates from each region reveal quite inelastic demand, while the degree of price sensitivity varied across the nation.

EMPIRICAL RESULTS: INCOME ELASTICITIES

- The income elasticities of demand also vary across Australia. Ranking of income elasticities indicates that tourists' demand for Entertainment is the most income-elastic (with a coefficient of 1.4), followed by Transportation (1.15), Accommodation (1.1), and Shopping (0.8); the least elastic is the demand for Food (0.7).

- Elasticities of demand for **Food** are around unity across the states and territories and are above the national average.

- Elasticities of demand for **Accommodation** also around unity, but are below the national average with the exception of TAS.

- Similarly, **Transport** elasticities are around unity and below the national average.

S7   Update with new estimates
                 Sarath, 2014/11/11

INCOME ELASTICITIES

- Elasticities of demand for **Shopping** showed significant variations across the states and territories, with NT having the highest elasticity; the lowest is for TAS.

- Finally, demand for **Entertainment** is the most elastic among all commodities, with the exception of the NT.

- Income-inelastic demand is evident in the case of the NT, while demands from all other regions showed elastic demand. The most elastic is the demand from QLD followed by VIC, SA, WA, and NSW.

SUMMARY OF THE MAJOR FINDINGS

- In summary, a comparison of demand elasticities revealed broad similarities' as well as significant variations in consumption patterns of tourists from the 8 different states.

- These variations may reflect differences in tourist preferences, incomes/budget and consumption habits.

- A general conclusion emerging from the estimated own price elasticities across the eight states/territories are that demands are price inelastic.

- Thus it appears that the five commodity aggregates examined in this study are necessities from the tourists' point of view.

CONCLUDING REMARKS

- In contrast to the observed very low price elasticities, income elasticities overall reveal relatively elastic demand.

- These findings suggest that an increase in a tourist's income/budget would increase the demand for tourism goods and services.

- It was also observed that there are significant variations in the degree of income elasticity across the eight states implying that tourists from different origins may have varying preferences for tourism goods and services.

- This is an important finding from policy point of view: For example, if one is to use national elasticity estimates as the basis for policy formulations, they may not bring about expected outcomes as the magnitude of elasticities vary across regions.

- Further, the elasticity estimates derived from regional models should provide a basis for policy simulations in evaluating policy options either directed at increasing gains from domestic tourism and/or to minimise existing disadvantages