

**MODELLING SPATIAL TOURISM AND
HOSPITALITY EMPLOYMENT CLUSTERS USING
GEOGRAPHICAL INFORMATION SYSTEMS**

ANJALI CHHETRI

BA (HONOURS) Delhi University

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DECLARATION

This thesis contains no material that has been accepted for the award of any other higher degree or graduate diploma in any tertiary institution. This thesis contains work of mine alone, and to the best of my knowledge and belief contains no material previously published or written by another person, except where due reference is made in the text. Furthermore, the work presented has been carried out since the official starting date of the program.

Anjali Chhetri

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LIST OF ACRONYMS

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AFL	Australian Football League
ANZSIC	Australian and New Zealand Standard Industrial Classification
ASGC	Australian Standard Geographical Classification
ATSA	Australian Tourism Satellite Account
CBD	Centre Business District
CCD	Census Collection District
ENW	Equalised Net worth
E&O	Education and Occupation
GIS	Geographic Information System
GMP	Gross Metropolitan Product
HH	High-High
IE&O	Index of Education and Occupation
IER	Index of Economic Resources
LGA	Local Government Areas
LISA	Local Index of Spatial Autocorrelation
LQ	Location Quotient
MAR	Marshall-Arrow-Rower
Moran's I	Global Measure (Moran's I)
NEG	New Economic Geography
NSW	New South Wales
NT	Northern Territory

OLS	Ordinary Least Square
OECD	Organisation for Economic Cooperation and Development
PCA	Principle Component Analysis
SA	South Australia
SAR	Ordinary Least Square
SEM	Spatial Error Model
SLA	Statistical Local Areas
TALC	Tourism Area Life Cycle
TAS	Tasmania
TEAs	Tourism Economic Accounts
T&H	Tourism and Hospitality
TRA	Tourism Research Australia
TSC	Tourism Supply Chain
TSA	Tourism Satellite Account
VCs	Virtual Clusters
WRPI	Weighted Retail Potential Index
WTO	World Tourism Organisation

ABSTRACT

Tourism is considered a mechanism for regional development with the potential to increase economic growth in regional and remote areas. Tourism however tends to spatially cluster to areas of resource advantage (i.e. tourism attractions) or of strategic importance such as transportation hubs. This is often referred to as the 'agglomeration effect', where related firms locate near one another to take advantage of pooled market and pooled resource supply allied to reduced service costs. An integrated cluster based approach is arguably well suited to assist regional development policies to gear towards achieving the geostrategic dispersal of tourism across regional and remote areas. The advocacy of cluster theory as a policy tool for tourism development however requires a thorough examination before it can be transmuted into public policy.

Drawing on cluster theory as the theoretical base, this thesis develops a spatial framework to examine the geographic clustering of tourism and hospitality employment in Victoria, Australia. It aims to answer four interrelated research questions: i) what industries represent the tourism and hospitality sector and what are its key components; ii) where are the tourism and hospitality-related employment clusters in Victoria; iii) what are the location-specific factors that drive the clustering of tourism and hospitality employment and iv) what strategic geo-targeted cluster-based policy can be formulated to improve evidence to guide destination planning?

Using the 4-digit Australian and New Zealand Standard Industrial Classification (ANZSIC) data, the sub-industries that 'explicitly' relate to tourism and hospitality were first individually identified and then the numbers of people working in these industries were aggregated. Results show that total employment in the tourism and hospitality sector in Australia for 2006 is 7.74 per cent. 'Cafes and Restaurants' (22.34%) are the largest

employer of labour force, followed closely by 'Takeaway Food Services' (20.53%) and 'Accommodation' (16 %).

Using principal component analysis, four key 'components' that define and characterise the underlying structure of the tourism and hospitality industry are identified. These include 'Tourism Operational Services'; 'Hospitality Services'; 'Entertainment Services'; and 'Infrastructure Operational Facilities Services'. The highly correlated component analysis indicates the functional interdependence of inter-related industries within the sector. The results show that the 'tourism operational services' are more widely distributed across the state, whilst 'hospitality services' are more concentrated in Melbourne and other regional cities/towns. The Melbourne central business district emerged as a hub for the 'entertainment services'; however there are also other pockets in regional areas that offer such services. Employment in 'infrastructure operational facility services' is largely segregated around airports and transit hubs to support tourist movements. There is evidence of a high concentration of employment along the coast and a few isolated pockets particularly along the Great Ocean Road, Phillip Island and areas around the alpine region.

The Local Indicator of Spatial Autocorrelation (LISA) technique was employed to identify five established spatial tourism and hospitality clusters in Victoria, consisting of a total of 28 Statistical Local Areas. Spatial econometric techniques were drawn on to identify location-specific factors that stimulate clustering of tourism and hospitality employment. Five contextual factors of geographic space that positively and significantly impact on T&H employment clustering were identified in Victoria. These include: the tourism potential index, proximity to coast, density of road network, gross regional product and index of economic resources. These variables collectively explained about 55 percent of variability

in T&H employment. The tests indicated the improved fit for the added variable (i.e. spatially lagged dependent variable) and confirmed the significance of spatial autoregressive coefficient, suggesting the better fit of the spatial lag model over ordinary least square or spatial error model. The significant effect of the spatial lag variable also suggests the prevalence of a 'spill-over effect', meaning a higher concentration of T&H employment in an area exerts positive externalities on its neighbouring areas. These spatial clusters could potentially act as growth foci to create synergy and foster spill-over effects through sharing of resources between inter-related and interdependent firms operating supply chains within the tourism sector.

The adoption of an integrated cluster-based spatial planning framework was shown to have the potential to permit tourism-led economic growth to be better spatially dispersed across Victoria. It is anticipated that through further investment in these employment clusters, the quality of tourism service can be improved, the tourism destinations can be better connected, the labour supply and tourism infrastructure can be better utilised and shared. The benefits associated with economies of scale and agglomeration will strengthen the competitive advantage and strategic positioning of Victoria as a leading international tourist destination. However, the successful implementation of clustering as a policy would require a stronger government stimulus to ignite the synergy towards creating vibrant tourism and hospitality employment clusters of global significance.

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Australia has long been experiencing an unprecedented growth in international and domestic tourism (Australian Bureau of Statistics, 2014). The Australian Tourism industry's significant contribution (direct and indirect) to the Australian economy from 1997-98 to 2012-13 is estimated at \$91 billion or 6.0 per cent of Australia's GDP (Tourism Research Australia, 2014). In 2013-14 International visitors arrivals grew 4.9 per cent to a record 6.6 million (Australian Government, 2013). The long-term vision of the Australian Government is for tourism to support growth of international and domestic tourism. Such vision requires the development of strategies to help meet customer expectations and enhance visitor satisfaction with service quality and the value of tourism products. The Australian Government (2003) has been committed to tackling this challenge by developing a highly skilled labour force specifically trained to provide tourists with the highest levels of quality and professional service. Prerequisites for achieving such a vision are effective and targeted policies that promote tourism and design innovative destinations which cater for a highly demanding, culturally diversified and economically differentiated tourism market. However, the Australian tourism labour market is experiencing a labour shortage with a predicted shortfall of 56,000 workers - including 26,000 skilled - by 2015, more frequent mobility across jobs and industries, greater job insecurity and acute inequalities in demand that are spatially and seasonally conditioned (Australian Government, 2014).

Tourism is prominent in Australia's economic restructuring. As the economy embraces a gradual shift from a manufacturing to a services economy it needs to also make the required labour market adjustment to deal with challenges associated with the transitioning. The regional, remote and coastal areas of Australia are particularly vulnerable because of increased reliance on tourism for employment and income. Some regions in Australia

specialise in a single industry sector, whilst others diversify their employment base to enhance economic resilience to global financial crises or shocks. Labour market policy to support mobility of skilled and trained labour is vital for the efficiency delivery of tourism and hospitality services (Austrade Commission, 2014). This requires identifying areas that are more resilient to the volatility of the constantly changing tourism demand and shifting markets (Ringbeck & Pietsch, 2011). It also necessitates formulating the labour market policies to support more vulnerable areas by providing employment opportunities for those who are at risk of labour market exclusion.

Tourism and hospitality employees have traditionally been seen as among the lowest paid of all Australian workers. This is not different to other countries including the United States where T&H workers are paid a minimum wage of US\$ 8-9 per hour (Department of Labour, United States). While in Australia, the national minimum wage is relatively higher compared to the United States (currently \$16.87 per hour), the income of T&H workers however in the US is often supplemented through a 'tip' (A gratuity - extra payment left by guests). Within the EU, there is an overall increase in part-time employment though there is a broad variation across different countries. For example, the part-time employment in Portugal is 5 per cent, whereas in the United Kingdom it is about 50 per cent and in Netherlands 68 per cent (Europa statistics). Furthermore, only 64 per cent of the T&H workforce is employed throughout the whole year in Spain due to changing seasons at resorts (International Labour Office, 2010).

Area-specific skill shortages in the tourism sector have been recognised as a national concern (Australian Government, 2007). In 2011-12, 7.9 per cent of Australian employment was in tourism (Tourism Research Australia, 2013), but there are considerable regional and

seasonal variations in employment meaning some regions are tourist employment intensive while others are less economically dependent on it. For example, tourism contributes 6.4 per cent to the Gold Coast economy in Queensland while in the Wimmera in Victoria it is about 1.2 per cent (Tourism Research Analysis, 2011). Tourism Research Australia (2011) has highlighted these regional differences (e.g. Perth, Katherine, and the Geelong region) by measuring tourism intensity, this measures the economic/ employment dependency levels on tourism. These studies noted that much of the variability in tourism-generated employment is due to differences in visitor expenditure relative to the size of a region's economy. A geo-targeted labour market policy such as training, skills upgrading and apprenticeships or traineeship is now needed to make adjustments to tackle future labour shortages. This would need additional workforce participants to support tourism services.

Clusters of as growth foci are often seen as a panacea for economic and regional development across a range of industries. For example services sector clusters such as California's Silicon Valley in the United States, Bangalore in India for software development and Cambridge for biotechnology in the United Kingdom are globally renowned success stories. The cluster-based regional policies are widely implemented in many industrialised countries such as the United States, the United Kingdom, France, Germany, the Netherlands, Portugal, New Zealand, and Japan (Motoyama, 2008). Policies promoting cluster based industries have also gained popularity in developing countries; where this cluster approach is seen as an instrument for regional development which can then stimulate sustain economic growth (Doeringer & Terkla, 1996; Schmitz & Nadvi, 1999).

In recent years, there has been growing interest in cluster-based tourism planning to enhance the economic resilience of tourism-dependent regions (Church & Frost, 2004; Müller, 2006; Lundmark, 2006), amid increasing evidence that the business and employment opportunities are greatly influenced by location. Cluster based planning is more appropriate for tourism as it exhibits core-periphery spatial structures (Hall, 2005). Also called a heartland-hinterland duality, ‘the core-periphery concept and model is based upon an unequal distribution of power in economy, society, and polity. The core is the dominating “central” realm, while the peripheries tend to be isolated, dependent, and underprivileged’ areas (Stadel, 1998, p.14). Tourism tends to form service clusters, which are often confined to strategic areas of economic and resource advantage. This is often referred to as the ‘agglomeration effect’, where related firms locate near one another to take advantage of pooled market and pooled resource supply as well as to reduce service costs (Krugman, 1991; Overman & Puga, 2009). For example, retail stores tend to create an agglomeration when located in shopping malls because they have greater access to potential customers. Further examples are that wine producers in California, France, Italy and Australia are clustered around areas of grape production and hotels on the Gold Coast in Australia tend to cluster along the beach.

Tourism is also seen as a mechanism for regional development with potential to spread economic growth to regional and remote areas (Hall & Page, 2006; Jackson & Murphy, 2006). However, tourists tend to congregate in metropolitan gateway cities, while other nature and rural-based tourist destinations remained relatively peripheral in terms of economic expenditure and visitor numbers. Notable exceptions are purpose-built resorts or desirable amenity locations such as coastal or mountain areas, which provide a focal point for tourism related mobility in non-urban areas (Müller, 2006; Lundmark, 2006). The Cluster-based approach to tourism planning facilitates collaborative sharing of resources,

technology and a skilled labour force for tourism and hospitality firms. Michael (2003) highlighted the economic and social opportunities for local communities through ‘the development of clusters of complementary firms that can collectively deliver a bundle of attributes to make up a specialised regional product’ (p. 133). Clustering of tourism and hospitality firms also provides business opportunities to build alliances to tackle larger projects, which could be beyond the ability of individual firms.

Despite acknowledging these benefits, the attempts to empirically measure the levels of clustering of tourism and hospitality firms or employment at a disaggregate level over a larger geographic space in Australia are rather limited, if not absent. Identification of strategically-oriented tourism and hospitality employment hubs will provide greater accessibility to employment opportunities; reduce transaction costs and help achieve the economies of scale through accessing a larger pool of customers. Spatially integrated tourism strategies and destination designs, linked to locational advantage/disadvantage, will help harness the full potential of spatial tourism and hospitality clusters.

There is extant literature on cluster theory from a firm perspective; however the literature on spatial aspects of Tourism and Hospitality (T&H) clusters is relatively scant. While some research exists, there are a number of gaps that require urgent attention. The fundamental questions, such as what constitutes a spatial T&H cluster, what measures can be used to quantify spatial clustering of firms or employment and what location-specific factors contribute to their formation, are yet to be empirically investigated. The tourism sector, as an aggregation of activities that offer similar products, has not yet been formally recognised partly due to the fact that tourism is usually considered part of consumer services rather than producer services (Loannides & Debbage, 1998; Coles & Hall, 2008). Therefore, the

attempts to empirically formalise the T&H clusters are limited (Jeffrey, 1990; Kontogeogopoulos, 1998; Chhetri et al., 2008) and typically employ firm-level data or aggregate data at a national or a broad industry scale. Most of these studies were carried out by economists wherein the key focus remained on economic outcomes.

The tourism sector as a collection of businesses serving tourists' distinctive needs poses difficulty in identifying specific industries directly or indirectly supporting tourism (Riley et al., 2002; Ayres, 2006; Leiper, 2008). T&H services (e.g. restaurant meals or local transport) offered at a destination may be shared by both residents and tourists. This makes it difficult to measure T&H as a stand-alone industrial sector. This thesis therefore aims to tackle this challenge by developing a methodology that can be used to more accurately and empirically quantify the T&H industry. Thus, there is a need to provide definitional clarity and methodological robustness before advocating the application of spatial T&H clusters as a planning tool.

1.2 AIM AND RESEARCH QUESTIONS

This thesis aims to identify the key spatial T&H employment clusters and to estimate the impact of location-specific factors on T&H employment clustering. Three inter-related research questions are developed to answer this research aim. These include:

- i) What industries represent the T&H sector and what are its key components;
- ii) Where are the tourism and hospitality-related employment clusters in Victoria; and
- iii) What are the location-specific factors that drive the clustering of tourism and hospitality employment?

1.3 RATIONALE FOR THE STUDY

The importance of tourism as an economic driver is growing both globally and in Australia. For example, in 2013 the global tourism industry employed more than 98 million people directly (Turner & Sears, 2013). The world International tourist arrivals for 2013 were 1.087 billion (World Tourism Organization, 2013). Australia's direct employment in tourism is around 550,000 people, whilst the indirect employment is about 397,000, with regional tourism accounting for around 185,000 jobs. There were 6.4 million visitor arrivals in Australia for year ending June 2013 (Australian Bureau of Statistics, 2013).

In 2012-13, direct tourism employment increased by 2.1 per cent or 11,500 jobs to 543,600 while the total Australian employment increased by 1.2 per cent (Tourism Research Australia, 2012-13). Despite the growing importance of tourism for the Australian economy as the 'glamour' often associated with T&H employment, the labour market outcomes and career trajectories or pathways that those in the workforce pursue are, in contrast, less promising. The reality is that the tourism workforce is typically characterised by a high proportion of low-skilled workers, lower average full-time earnings, a female dominated and culturally diverse labour force, a high incidence of casual and part-time employment, high rates of mobility between jobs and between unemployment and employment, a low level of union membership, and a large proportion of owner-operated small businesses (Productivity Commission, 1996; ABS, 2002, Australian Government, 2006). For instance, the average full-time earnings in the tourism sector are markedly lower than in other sectors (Baum, 2008; ABS, 2006).

The T&H workforce faces poor job security, little career prospects and bargaining power. Even people with qualifications in tourism and hospitality are less likely to be in jobs that

pay commensurately with their qualifications (Mavromaras et al., 2009). Modelling the factors that cause or mediate poor working conditions for the T&H workforce provides an evidence base to inform area-specific policies which could ameliorate the economic and social well-being of the tourism-dependent labour force. Mapping areas that have acute shortages or oversupply of labour could provide an evidence base for the formulation of area-specific policies that support the skilled workforce in undertaking jobs that are commensurate with their qualifications (Australian Government, 2014). The necessity to match high-level investment in tourism infrastructure with investment in skills-based training has been identified as a government priority in many jurisdictions in Australia and overseas (Tourism NSW, 2006).

Australia has many varied tourist attractions at disparate locations, spread out over an extensive area. Australia's limited domestic tourism demand, geographical isolation, constrained mobility and restricted accessibility to regional and remote attractions have all collectively hampered the prospect of marketing Australia a global tourism destination. For instance, the geographic expanse of Australia and the consequent 'tyranny of distance' pose a number of challenges for tourism planners to formulate effective plans and policies. First is the availability of labour in areas where and when they are needed, second is the accessibility of prominent tourist destinations to visitors particularly those international tourists on a short trip, and third is the dispersal of tourists to regional and remote areas in a most economical and efficient way.

Due to the small domestic demand for T&H services, the opportunities for firms to achieve economies of scale as well as scope are rather limited. Non-availability of skilled labour in areas of high demand during peak seasons further escalates the costs of labour (Australian

Government, 2014). The high dollar value in recent years has positioned Australia as a more costly, less competitive destination in the global market. This in turn has resulted in lower demand from overseas in recent years (Australian Bureau of Statistics, 2011). Given the minimum wage threshold with weekend and night penalty rates, it is rather difficult for T&H firms to remain globally competitive in comparison to popular mass tourist destinations such as Phuket, Thailand or Bali, Indonesia. Unless Australia specifically tailored tourism products for a niche market, the chance of succeeding as a leading tourism destination in an international market is rather bleak (OECD, 2003). In addition, the diminishing government funding available for tourism infrastructure construction and for destination marketing requires strategizing investments in promising and more resilient regions. Such regions with a robust tourism base could enable economies of agglomeration to be achieved through sharing of resources and improved utilisation of public infrastructure such as public transport or parks and reserves.

There is an urgent need to develop and deploy spatial strategies to help promote the policy of ‘regional dispersal’ of tourists and their expenditures to generate employment for local community in regional and remote locations. Concentration of visitors in large gateway cities is a key obstacle to achieving the dispersion of visitors into regional and remote Australia (Tourism Victoria, 2010).

The regions currently used for tourism planning and product development purposes in Australia (i.e. ABS tourism regions 2006 and tourism product regions) are not sophisticated in terms of their design to represent the constantly changing production and consumption patterns of tourists. The use of other labour market regions such as Department of Employment and Workplace Relations (DEWR) and the Bureau of Transport and Regional

Economics are also not purpose-built for T&H planning. The use of current tourism regions as a planning spatial unit is marred by three major problems. Tourism regions are primarily designed on the basis of tourism attractions that each region offers to tourists without considering the movement patterns of tourists or tourism dependent labour force. These regions are created to represent a particular theme, for instance, the wine region or goldfields. Visitors with little or no interest in such a recreational pursuit are more likely to opt out of visiting these destinations. In addition, the tourism regions are static and formal with discrete geographic boundaries. The boundaries of tourism regions are also coterminous to local government areas in order to better integrate tourism plans with land use and transport plans. While this is good idea, for tourism growth to be sustainable, a more integrated tourism planning framework, cutting across the boundaries of tourism products and regions, must be developed so that decisions concerning business and infrastructure investments in more vibrant spatial tourism clusters can be prudentially reached. Smart designing of tourism regions requires a functional integration of regional or local tourism attractions with key gateway cities and strategic employment hubs. A cluster-oriented destination design provides an alternative model for tourism destination planning, where lower-order attractions can be hierarchically connected to higher-order high-volume tourist destinations.

As such there is a compelling need to generate more detailed knowledge of the T&H clusters through which areas of strategic importance can be identified and mapped. Geo-targeted tactical and strategic investments that help mobilise the skilled labour force can fill the gap between location of jobs and prospective employees. This approach will preemptively tackle potential market failures (i.e. mismatch between demand and supply) to help reduce inflated costs of T&H services during peak seasons or suppress wages in areas

of oversupply. Systematic research on the spatial dynamics of T&H clusters has barely begun and this deficiency underpins the thrust of this thesis.

1.4 RESEARCH METHODOLOGY

This section outlines the research methodology, which includes a description of the study area, a methodological framework and thesis structure. This thesis is organised into chapters, which are designed to address the research questions set out for the thesis. The chapter descriptions will outline the objectives and methods used in the construction of the model.

1.4.1 Study area: Victoria

Victoria, one of the states in Australia, has been selected as a study context area to analyse T&H employment clusters. Victoria is located in the south-eastern corner of Australia and is the smallest mainland state. Victoria, with its capital Melbourne, represents both urban and regional areas. Victoria is one of the most popular tourist destinations in Australia. Victoria's tourism industry was estimated at \$19.1 billion in total Gross State Product (State Tourism Satellite Account, 2011-12). Tourism directly generated 123,000 jobs in Victoria or 4.3 per cent employment in the state (Tourism Victoria, 2013). Domestic Overnight and Daytrip Visitation to Victoria were 17.9 million and 43.8 million respectively for year ending June 2013. Victoria is also a major destination for international tourists. A total of 1.9 million tourists visited Victoria in the year ending June 2013 (Tourism Victoria, 2013). These visitor statistics show the importance of the T&H sector to the Victorian economy. However, it requires further insight into the more disaggregate level spatial analysis to capture the variability in tourism dependency.

In Victoria, the tourism industry workforce consists of “comparatively high level of casual, part time employment, hours worked outside of normal business hours, high staff turnover, younger workforce, lower level of formal qualifications, and high proportion of ownership operator businesses” (Victorian Government, 2006, p. 2). The lower wage to T&H workforce has been sustained in Australia despite the labour and skills shortages experienced over the past decade. Often, the labour supply shortages lead to higher wages. Nankervis (1993) argues that the lower wage is partly due to the transient nature of the workforce, low skills levels, higher turnover rate and lower rate of union membership. Studies by the Australian Tourism Labour Force and the Labour and Skills Working Group of the National Long Term Tourism Strategy also highlighted the impact of current labour and skills shortages in limiting the productive capacity of Australian tourism. This is hampering efforts to compete successfully with overseas destinations (National Tourism Alliance, 2013). Recruitment and retention of labour remains a significant problem for tourism businesses. National Tourism Alliance (2013) strongly urges that the Government adopts policy settings which):

- “Ensure that gaps in domestic skills and labour are met;
- Ensure that tourism and hospitality are included in future skills, training and labour market programs;
- Provide tourism and hospitality operators with greater access to temporary/skilled workers;
- Establish an effective system of workplace regulation that recognises the 24/7 nature of tourism and hospitality, particularly the predominance of small and regional based businesses” (page 27).

There are three major reasons for selecting Victoria as a study area. These include:

- First is the rapid increase in the number of visitors which requires further investments in tourism infrastructure. Such investment decisions necessitate geo-targeted strategies built on an empirically-driven evidence base to aid infrastructure investment decision-making.
- Second is the unprecedented growth in the number of tourists from Asia. Destinations in Victoria, particularly in regional and rural Victoria, are largely designed to attract and serve European and American tourists with their particular interest in nature based coast-oriented tourism or wine tourism. Research should be carried out to generate cluster-based design outcomes for key tourist destinations through which the preferences and choice options for a diversified visitor base could be taken into account.
- Third is a prominence of Melbourne as a gateway or base tourist destination with most international and domestic visitors undertaking day trips to experience regional Victoria. Victoria's smaller geographic extent and more accessible tourist attractions from Melbourne provide a strong theoretical foundation to explain the reasons for spatial clustering of T&H clusters. Given the importance of dispersing tourists in regional destinations through promoting overnight stays, there is a strong need to design tourism products that suit the changing needs of highly-demanding, well-informed and time-constrained tourists.

1.4.2 Methodological framework

A three-stage process is designed to implement this research. These stages include: a) theoretical, b) measurement and modelling and c) policy and planning. A quantitative approach to data analysis is adopted, which specifically answer the research questions set out across these stages. Geographic information systems (GIS) will be used to create a

spatial database of T&H employment and to generate location-specific information layers. Spatial statistics will provide methods to measure and model spatial T&H employment clusters. Figure 1.1 illustrates these stages and their associated research questions.

The theoretical stage will investigate the theoretical questions and build an argument for adopting a spatial approach to conceptualising the T&H employment cluster as a spatial construct. The ontologies of T&H spatial clusters will be examined to establish the nature, scale and constituents of a typical T&H cluster. This stage will draw from classical and contemporary thoughts on cluster theory and then contextualise it in the formulation of T&H clusters. The measurement and modelling stage quantifies the spatial clustering of T&H employment. It employs multivariate techniques to extract highly correlated structure in T&H employment data. Spatially correlated structures will then be quantified and mapped to depict the spatial association of broader T&H employment functions. Spatial statistics will provide techniques to quantify the spatial clustering of T&H employment as well as build a spatial model to estimate parameters to drive the clustering of T&H employment in Victoria.

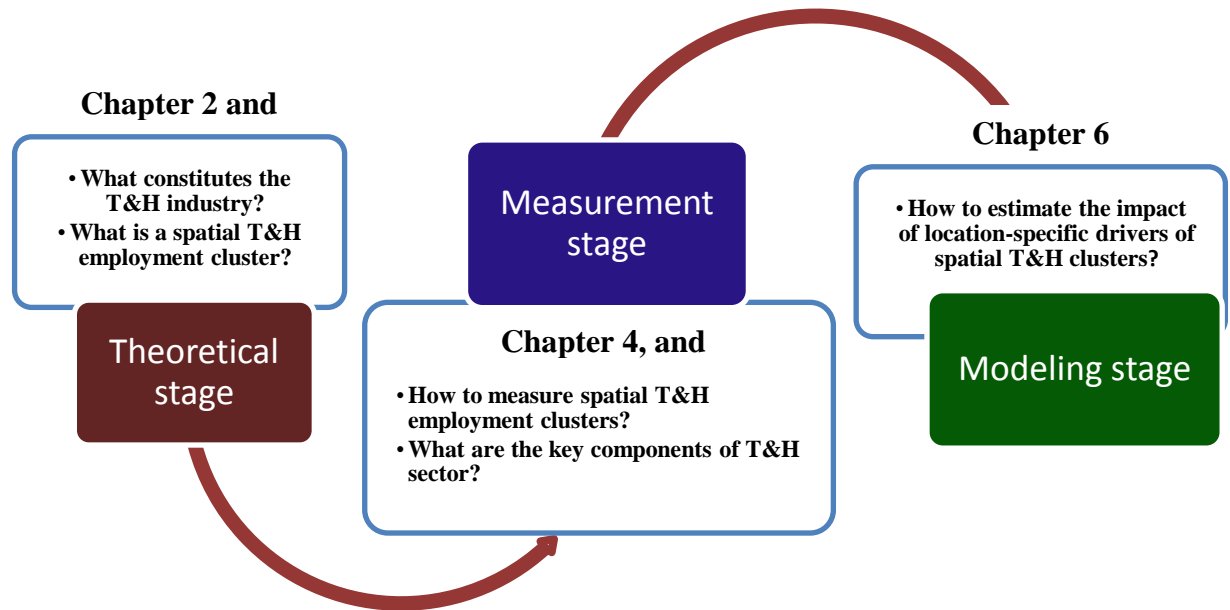


Figure 1.1: A methodological framework

The policy and planning stage provides spatial strategies and destination spatial designs to improve visitor management and enhance tourism employment development in Victoria. A set of recommendations will also be made to improve tourism in the state.

1.4.3 Thesis structure

This chapter introduced the topic, set out the aim and research questions and highlighted the significance of this research while the objectives and the methods of subsequent chapters are described as follows.

Chapter 2 starts with an upfront discussion on the meaning of the cluster concept in general and the spatial T&H cluster in particular. It will examine various types of cluster concept across a range of disciplines. This chapter also constructs the notion of a spatial tourism and hospitality cluster and highlights the importance of incorporating a spatial dimension in cluster-led tourism planning. The first two research questions in the theoretical stage (See

Figure 1.1) will be addressed in this chapter. Overall, this chapter develops a conceptual framework for this research wherein a discussion on the meaning, scope and constructs of spatial T&H clusters will be carried out.

Chapter 3 develops a theoretical framework for this research with a particular focus placed on cluster theory. It begins by examining the historical evolution of cluster theory. It presents a range of examples of leading clusters around the world and explores the factors that led to the creation of those successful and innovative clusters. Key advantages emanating from the clustering of firms are summarised in this chapter. Finally, the role, importance and significance of location-specific attributes of contextual environment on T&H employment clusters are presented to develop a methodological framework for this thesis in Chapter 4. Overall, this chapter discusses the theoretical and methodological framework for spatial Tourism and Hospitality employment clusters, leading towards setting up the context to measure and model T&H employment clusters.

Chapter 4 develops are research methodology to implement the argument for adopting a spatial theoretical approach for mapping and modelling T&H employment clusters. It begins with a description of the study area, in addition to providing details on datasets used in this research. It presents the details of the case study by highlighting the key patterns and trends in the T&H sector in Victoria, Australia. It then explains the rationale of using spatial econometrics techniques to incorporate the spatial dependence of tourism employment and spill over effects of spatial clusters. Other measures of clustering are also discussed, but the core emphasis is on explaining the spatial autocorrelation and auto-regression techniques. Overall, the methods and modelling techniques that are applied to identify spatial T&H clusters and the underlying drivers are explained in chapter 4.

Chapter 5 presents the results of multivariate analyses. The analysis proceeds by identifying the industries that are related to the tourism and hospitality sector. Principle component analysis will be carried out to compress these industries into components called ‘functions’ that define the underlying structural dimensions of the tourism and hospitality sector. These functions as well as the aggregated tourism and hospitality sector will then mapped using GIS. The results are also tabulated with visitor data to establish the relationship between supply of labour and demand for tourism and hospitality services. Overall, this chapter will characterise the T&H sector and its various dimensions.

Chapter 6 serves two purposes. First, it measures the key spatial tourism and hospitality employment clusters and second it builds spatial econometric models to estimate the impact of location-specific attributes on T&H employment clustering. Using GIS, a range of statistical variables are generated to represent the location-specific attributes of geographic space. Spatial auto-regression models and their assumptions are discussed. The results are then presented in this chapter.

Chapter 7 summarises the key findings and discusses the scope of this research. It also presents policy recommendations and planning implications of the research findings. It proposes design principles to spatially integrate spatial T&H employment clusters into tourism planning and destination design. The research questions set out in this thesis are also revisited to evaluate whether they were adequately answered or not. Future direction of this research, along with the key limitations, is also discussed in this chapter.

1.5 SUMMARY

This chapter has established the broader context within which this research on T&H employment clusters will be carried out. It provided the rationale for undertaking this research by presenting an argument to investigate the opportunities to apply a cluster-led

planning approach to tourism planning and destination management. This chapter has also formulated a broader research framework, which set out a three-stage process to measure and model spatial T&H clusters in Victoria. The development of a spatial methodology has been argued to spatially capture employment clustering. It has also established the research aim and set out high-level research questions, which will be addressed in the forthcoming chapters.

The next chapter introduces various concepts of T&H clusters and describes their characteristics.

CHAPTER 2

MEANING AND TYPES OF TOURISM AND HOSPITALITY

CLUSTERS

2.1 INTRODUCTION

This chapter discusses the meaning, scope and types of T&H clusters. It focuses on a brief overview of the T&H industry, followed by a discussion on various definitions of the ‘cluster’ concept framework to identify and characterise different types of T&H cluster, which are then developed using the spatial scale as a defining criterion. This enables identification of the spatial scale appropriate for analysing T&H clusters. This chapter concludes with presentation of an argument for the adoption of a spatial perspective to identify, characterise and geographically delineate the key tourism and hospitality clusters.

Specifically, this chapter addresses the following research questions:

- What are tourism and hospitality clusters?
- What are the different types of tourism and hospitality clusters?
- How are tourism and hospitality clusters identified and spatially represented?

2.2 UNDERSTANDING THE TOURISM AND HOSPITALITY INDUSTRY?

In order to define the concept of tourism and hospitality clusters, it is vital to understand the T&H industry. The term ‘tourism industry’ has been in common usage for at least 200 years (Tower, 1985). However, it was not until the 20th century that the ‘tourism industry’ received widespread recognition as an important component of the national economy. Norval (1936) is among the first pioneers who classified and associated tourism to a component within an industry sector. When Adam Smith coined the term ‘tourist’ in the 1770s, the commonly agreed meaning of ‘tourism’ was not associated with an industry or industry sectors (Leiper, 2004). This meaning resembles other words with ‘-ism’ as suffix (e.g. idealism, capitalism, socialism and so on) where ‘ism’ indicates ‘a distinctive doctrine, theory or practice’ (Chambers English Dictionary, 2013). Waheb (1974), an economist,

recognised that certain activities associated with tourists have an impact on the economies along similar lines to industry in general.

More recently, the term ‘tourism industry’ is used as a generic expression to represent an aggregation of industries, offering products to satisfy tourists’ distinctive needs. Tourism as a single homogeneous industry is yet to be formally recognised in national accounts. This is due to the tourism sector being usually considered as a part of consumer service rather than a producer service (Loannides & Debbage, 1998; Coles & Hall, 2008). It is typically a non-manufacturing and non-producing service sector. Leiper (2008) highlighted the conundrum of using the term ‘industry’ in the context of tourism, which is further compounded by apparent challenges in defining ‘tourist’ and ‘tourism’. Furthermore, some of the T&H services such as restaurant meals or local transport, which are offered at a tourist destination, are equally shared by residents and tourists. Steare et al., (2005) warned that the lack of conceptual and methodological understanding of these central concepts in tourism could potentially lead to — ‘definitional uncertainty debilitating syndrome’ (DUDS).

More recent literature however considered T&H as integrated parts of a larger tourism supply chain (TSC). For example, Tapper and Font (2004) defined a TSC to consist of ‘the suppliers of all the goods and services that go into the delivery of tourism products to consumers’ (p.1). A typical tourism product such as a tour package requires combining services from a range of interrelated and interdependent industries, which are essentially parts of the same value chain. Value is added to the product (raw materials) or services in all stages of production till it is transformed into the finished product (e.g. a souvenir for tourists). A tourism supply chain typically consists of four interrelated components: a tourism supplier, a tour operator, a travel agent and customer. They are all seamlessly

connected to a single value chain, linked to production, procurement, distribution and marketing of tourism products.

Piboonrungrroj and Disney (2009) identified three compulsory and one optional components of TSC:

- i) Tourism service providers or first-tier suppliers (e.g. accommodation or passenger transport);
- ii) Input providers or second-tier suppliers (e.g. food beverage suppliers);
- iii) Tourists or customers; and
- iv) Intermediaries (e.g. travel agencies and tour operators) – Optional.

The tourism industry requires a seamless integration of a range of T&H services, which are directly or indirectly involved in the production of tourism products. The methodology that estimates the economic contribution of tourism industry to a national economy has taken this into account. For example, the Tourism Economic Accounts (TEAs) and Tourism Satellite Accounts (TSAs) are widely practiced in many countries, including the USA, Australia, the UK, and Canada. The reliability of such methodologies is fully endorsed by the Organisation for Economic Cooperation and Development (OECD) and World Tourism Organisation (WTO). Using the Standard Industrial Classification codes, Statistics Canada (2005) introduced ‘Tier 1’ and ‘Tier 2’ categories to distinguish earnings directly from tourists and those derived from a mix of tourists and non-tourists. In Australia, the Australian Bureau of Statistics (ABS, 2006) developed the Australian tourism satellite account (ATSA) that differentiates the ‘tourism characteristic industries’ comprising air and water transport, accommodation, cafe, and restaurants and food outlets, travel agency and tour-operated services, motor vehicle hiring and taxi transport; and the ‘tourism connected industries’ including clubs, pubs, other road transport, food manufacturing, transport

equipment manufacturing, casinos and other gambling services, and libraries, museums and arts.

A typical tourism satellite account (TSA) adopts the technique which allocates a portion of an industry marginally contributing to tourism (for example, transport) based on Input-Output model interaction data. The Australian Tourism Satellite Account (ATSA) framework computes the share of tourism, also called the tourism intensity ratio that relates to education or road transport industry, which they calculate as 4.6 per cent and 9.8 per cent respectively (ABS, 2006-07). In 2010-11, the ATSA estimated there were about half a million jobs in the tourism industry in Australia. Direct employment in tourism was about 4.5 percent of total employment in 2010-11, which is much higher than industries that are deemed significant, such as Mining (1.9 per cent), Electricity, Gas, Water and Waste Water Services (1.3 per cent) and wholesale Trade (3.6 per cent).

Despite the progress made through the Tourism Satellite Accounting methodology, there are a number of concerns (McRae-Williams, 2004), which required further discussion. There is no doubt that a range of industries serve tourists; nonetheless they are not entirely dependent on income from tourism. For example, the ATSA (2010-11) estimated jobs include construction workers building downtown hotels, dairy farmers producing milk consumed by tourists; computer programmers designing reservation systems and the lawyers, bankers and accountants who service tourism clients. People employed in these sectors spend only a small part of their job helping tourists, and their job may be only partly dependent on tourism. Leiper & Hunt (1998) raised concerns over the estimated number of jobs that stem from tourism, which are often exaggerated. One critique of ATSA is the adoption of the demand-side perspective, where the measuring stick for employment supported by tourism

is tourists' spending, from which estimates are calculated about full-time equivalent jobs. These equivalent full-time jobs, which are aggregated from the estimated total working hours, therefore do not represent real jobs in the tourism sector as they are drawn from other sectors such as the retail sector or health care. The procedure for estimating employment therefore should be taken into account when utilising the TSA generated tourism employment data to map tourism and hospitality clusters.

2.3 WHAT IS A TOURISM AND HOSPITALITY CLUSTER?

A cluster, from a geographical perspective, is an agglomeration of objects, phenomena or events within a geographically bounded space. Henceforth, atypical T&H cluster is a spatial agglomeration of interrelated and interdependent T&H firms and organisations. An archetypal 'tourism industry cluster' constitutes core tourist attractions, tourism enterprises and tourism-related support infrastructure such as transport providers, training organisations, and industry associations. When firms cluster they gain the benefits of agglomeration as well as economies of scale. For example accommodation or flight cost is relatively cheaper to travel to popular mass tourism destinations such as the Gold Coast or Las Vegas. These tourism destinations attract firms or businesses, which service the distinct needs of tourists. They compete, collaborate and gain cost advantages associated with co-location.

A T&H cluster is inherently a service cluster, but its theoretical genesis can be linked to an industrial cluster. The concept of cluster is not a new concept (Motoyama, 2008). Clusters existed firstly in the form of 'externalities' (i.e. third party effects or spillover) and 'agglomeration' (i.e. locations of intense economic activity) (Motoyama, 2008; Marshall, 1890), then later as 'innovation milieu' (i.e. informal social relationships and collective

learning processes) in the 1980s (Becattini, 1987; Brusco, 1986; Dei Ottati, 1994), and more recently as virtual clusters with no discrete geographic boundaries (Brusco, 1982; Piore & Sabel, 1984).

The concepts such as ‘growth poles’ (Perroux, 1955), ‘industrial districts’ (Bramanti & Ratti, 1997; Brusco, 1982; Piore & Sabel, 1984), ‘local production systems and networks’ (Belussi, 2001), and ‘technological districts’ have all preceded the idea of a cluster.

Industry clusters are ‘geographical concentrations of industries that gain performance advantages through co-location’ (Doeringer & Terkla, 1995, p. 225). Similar to this, Swann and Prevezer (1996, p.139) define an industrial cluster as a ‘group of firms within one industry based in one geographic area’. However, Rosenfield (1997) refers clusters to reflect interdependencies among industries and firms that lead to performance gains through co-location, and alliance’s shared input. Similarly, Roelandt and den Hertog (1999) give greater emphasis on firm linkages and interdependencies. They present clusters as: ‘networks of production of strongly interdependent firms (including specialist suppliers), knowledge producing agents (e.g. universities, research institutes, engineering companies), and institutions (e.g. brokers, consultants), which are linked to each other in a value adding production chain’ (1999, p. 9).

In 2005, the Organisation for Economic Co-operation and Development (OECD) developed a comprehensive cluster framework to guide regional development strategies. To add to the definition of the term ‘cluster’, the OECD (2005) represented ‘an agglomeration of vertically and/or horizontally linked firms operating in the same line of business in conjunction with associated institutions’ (p. 29). From the management perspective, Porter

(2000) presented the cluster concept as a strategic tool. He defined a cluster as a ‘geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities’ (p. 16). Hill and Brennan (2000) reiterate Porter’s viewpoint by stating that the spatial concentration of interrelated businesses was the prerequisite for the creation of competitive industrial clusters. Brenner (2004) also highlighted the importance of local processes, where he considered an industrial cluster as an outcome of industry co-locating to induce business and client transactions where self-augmenting processes occurred.

In a more recent study, Nianmei (2010, p.71) has listed three main characteristics of tourism industry clusters. The first characteristic relates to the ‘*flexibility of geo-spatial agglomeration*’, which creates the ambiance for firms to co-locate in areas of high tourist visitation. The second characteristic is the ‘*innate nature of industrial cluster model*’, which creates a value chain by establishing the relationship between suppliers and users (Nianmei, 2010, p. 71). For example, the extended length of vertical separation of tourism products and services, ranging from food supply, accommodation, shopping and entertainment, through to travel and transportation, necessitates an inter-industry specialisation and effective coordination of suppliers. The third characteristic is the ‘*economic externalities*’ that arise from the common use of public infrastructure and knowledge resources (Nianmei, 2010, p.71). These characteristics of tourism industry cluster are similar to those of industrial cluster, except that an array of T&H services is linked to the localisation behaviour of clusters.

To recapitulate, there are arguably multiple meanings assigned to a cluster concept, depending upon the way the term is constructed and contextualised (Rosenfeld, 1997;

Brown, 2000). As noted, a single all-embracing universalistic concept of cluster is yet to be developed. Notwithstanding, there are some characteristics, which are common in above mentioned definitions. These include:

- i) A geographical concentration of firms;
- ii) A group of interrelated and interdependent firms and institutions operating within the same industry;
- iii) A collection of firms collaborating and competing to achieve efficiency; and
- iv) A strategy to forge company alliances through building trust, informal contacts and social capital.

This thesis will largely focus on the spatial aspect of T&H cluster. Other aspects of T&H clusters are not taken into account when identifying and delineating their geographic extent. In addition, the term tourism sector, in this research, is interchangeably used for the T&H sector.

2.4 TOURISM AND HOSPITALITY CLUSTER AS A SERVICE CLUSTER

A T&H cluster is typically a service cluster. Service clusters are often categorised as either skill based, knowledge based or are created to fulfil customer specialist needs such as tourism resorts in a remote location. Unlike the traditional industrial clusters, which are directed towards achieving economies of scale through increased production, the service-oriented clusters, in contrast, are built on consumption, value co-creation and innovation (Hsieh, 2013). The components that constitute T&H services clusters are often not physical. They are a combination of processes, people's skills, service delivery provision and materials for consumption. To a large extent, the services base of the tourism industry prohibited the application of cluster-led tourism planning (Nordin, 2003).

The cluster concept is of utmost importance to the T&H industry as it requires a seamless integration of interdependent, yet discrete firms, which are linked to typical tourism supply chains. The T&H clusters are essentially demand-driven service nodes, which are heavily dependent on localised and destination-based structures to support services to tourists, visitors and residents. This is because a typical tourism product requires combining a range of products and services into a single product to deliver the experience that tourists seek to obtain at a tourist destination. There is often a predominance of supplier-dominated firms, which service the needs of tourists and residents in recreational and personal services such as restaurants, accommodation services, tourism and retailing.

As noted above, there are numerous attempts to conceptualise the cluster concept, but the focus remained on an industrial rather than service cluster. In a typical cluster development process, the type and characteristics of industry have little relevance *per se*. An industry whether it is related to high-tech or low-tech, manufacturing or services, or resources-based or knowledge-based entails no significant difference in the process of economic localisation. T&H clusters essentially are no different to other types of cluster. They can be characterised, *firstly as* the agglomeration of T&H industries or employment within a geographically bounded area; and *secondly* as a mechanism for the establishment of closer relationships and business linkages between the cluster members. In this research, a T&H cluster is argued to represent a spatial aggregation of T&H related firms or organisations operating within the same industry.

2.5 TOURISM AND HOSPITALITY CLUSTER AS A DYNAMIC SYSTEM

Tourism and hospitality clusters are not static; they are dynamic. Clusters evolve over time. They germinate, grow, mature and decline or rejuvenate. Clusters remain functional for

decades, if supported by renewal process (OECD, 2001) or decay and eventually disappear. The space economy and its embedded differences in resource endowments provides a comparative advantage for resource-rich destinations, which strategically position them to efficiently harness these resources to compete with other regions (Ritchie & Crouch, 2003). These destinations then begin to cater for ‘mass-tourism’, which also allow for achieving scale economies. For example, resources such as tourism attractions, capital, labour and technology, provide comparative and competitive advantages to those areas, which in turn accelerate spatial agglomeration of T&H services, thus employment opportunities for workers. Popular tourist destinations such as the Gold Coast in Australia or Hawaii in the United States are notable examples of T&H services clusters, which are developed to service a large influx of tourists, particularly during the peak seasons. These strategic areas of resource advantage are more likely to achieve ‘increasing return of scale’ and ‘economies of agglomeration’, which in turn enable tourism operators to reduce costs and improve services. These benefits however undermine the economic argument for promoting regional parity.

Press (2006) adapted the cluster development model of Allen (1997) and identified three-stages, namely emergence, endurance and exhaustion. Maskell and Kebair (2006) have presented these stages using three core arguments for sustained growth of clusters. The ‘emergence’ stage represents when firms start to cluster in a strategic location, which has an endowment of a natural or social resource for an industry to grow. The existence argument demonstrates substantive economic and social benefits of clustering for firms (Maskell & Kebair, 2006). In ‘endurance’ stage, agglomeration externalities exert a stabilising influence and increase the competitiveness of clustered firms in comparison to isolated organisations (non-clustered). This is explained through the extension argument which highlights the

conditions when the growth of cluster starts to reach closer to a maximum threshold limit. Negative externalities restrict the growth of cluster within a manageable limit. When the negative externalities increases the transaction costs, then the firms within the cluster start to move out, which leads to the onset of exhaustion stage. This is supported by the exhaustion argument that highlights the possible erosion of ‘scale economies’ and onset of ‘diseconomies’. Overgrown agglomerative economies therefore inflict some negative effects such as a rising costs of labour, high land rental, congestion costs and pollution (Phelps & Ozawa 2003). This accentuates firms’ tendency to disperse to other alternative locations when the return from agglomeration starts to diminish. About fifty or sixty per cent of firms exit the cluster (Agarwal & Gort, 2002; Klepper, 2002; Ridley, 2004). The firms that are left behind adapt to change by devising new management strategies to cope with diminishing return. In some cases, the creation of a regional supply network or a regional hub-and-spoke network binds firms together within the region that begins to take advantage of increased return from dispersion economies (Markusen, 1996).

From a tourism management perspective, it is vital to engage in debates on the types of tourism development model, which will then determine the kinds of strategy and policy to be pursued. Cluster is one such approach that has now being widely adopted as a policy across a range of industries, particularly in manufacturing and high-tech sectors. The opportunity to fully harness the potential of T&H clusters to reduce operative costs, to share common resources and to support open innovation has yet to be realised. Gunn (1997) however recognised the potential of tourism industry to offer travellers a great diversity and volume of services when T&H firms co-locate in close proximity. Most of the tourism growth models are similarly founded on economic growth theories, which heavily rely on cyclical tourism growth patterns. As shown in Figure 2.1, Butler’s tourism area life cycle

(TALC) model (Butler, 1980) is one such example, which consist of several stages of tourism growth and resembles S shaped curve of the tourism product life cycle (Butler, 1980). Prideaux (2004) points to the fact that ‘a number of typologies and models have been proposed to explain the processes of growth, but only the Tourism Area Life Cycle has been extensively tested in the literature’ (p. 26). Prideaux explains the development of the Gold Coast from 1870 to 1997 through the Resort Development Spectrum to represent the expansion of tourism from local tourism to international, through to post-mass tourism. As a result, a stronger core-periphery spatial structure is established with an optimal tourism infrastructure centred on key anchors to efficiently deliver T&H services to tourists and residents within their hinterland.

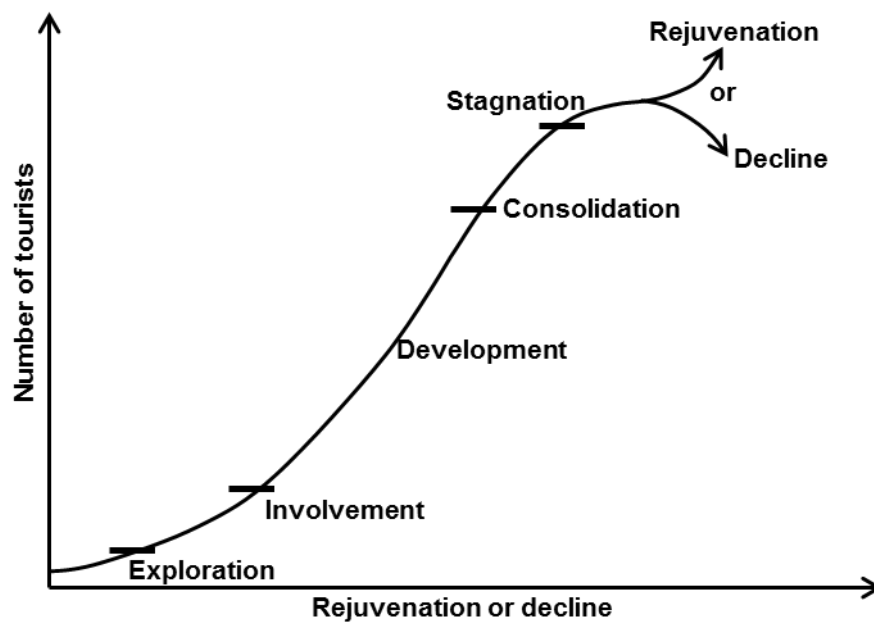


Figure 2.1: Tourism area life cycle (TALC) model (Butler 1980)

Earlier theories in regional science and economic geography were founded on similar premises to those of cluster theory. For example, Perroux (1955), which was grounded in the diffusionist paradigm, where a growth pole, similar to the cluster concept, is conceived as a

rapidly expanding node of propulsive industry with strong industry linkages to generate multiplier effects and facilitate rapid innovation. The characteristics of a ‘growth pole’ also resemble an industry cluster wherein firms are geographically concentrated in strategic locations. Core-periphery model was extended to include regions traversing through a spectrum of economic growth. These regions include: the core, upward transitional and downward transitional regions (further sub-divided into resource frontiers and special problem regions) (Friedmann, 1966, p. 40-44). The relevance of a cluster-based growth model is particularly critical for tourism industry as it is perceived as an instrument of regional development with the potential to permeate tourism growth in regional and rural areas (Jansson & Müller 2007; Hall & Michael, 2007).

From a theoretical perspective, it questions the fundamental premise of endogenous regional economic growth theories such as Perroux (1955), Hirschman (1958) and Friedmann (1966), which have argued economic growth at a certain point starts to percolate through to less developed areas as the capital/labour and technology becomes more mobile. Hirschman (1958) and Myrdal (1957) however contradict the equilibrium theory and noted the perpetuated polarised regional structure with substantial sustained regional differences in economic growth. Myrdal’s (1957) critics also accentuated the strengthening of cores and weakening of periphery through backwash effects, creating a widening gap between rich and poor regions, resulting increased regional inequality. More recent theories however accepted the significance of agglomeration and recognised the clustered pattern of economic growth as an inherent characteristic of space economy. The perspective that argues for monopolistic competition and increasing returns, as opposed to constant returns-perfect competition, has gained popularity. This new genre, often referred as ‘New Economic Geography’ (NEG), was able to explain where and why employment or economic activities

cluster and how growth of economic agglomerations is sustained. The economic benefits of tourism clusters are largely derived from multiplier and accelerator effects; while the social benefits usually stem from externalities as Michael (2003) reaffirmed.

There is some degree of agreement that tourist attractions in regional and remote areas are relatively dispersed in comparison to urban or city-based attractions. It would be reasonable to assume that T&H industries are more likely to cluster in urban areas; whereas in rural and regional areas it would largely be dependent on the distribution of tourism attractions. The initial competitive advantage often results a stronger core-periphery spatial structure, whereby the required tourism infrastructure is often established in 'cores' (e.g. city centre) that deliver key services to tourists and residents within their peripheries. Furthermore, the realisation of the potential to capitalise the growth prospect relies on the distribution of attractions and amenities in tourist destinations. If the spatial pattern is dispersed, any tourism policy built on the assumption of achieving economic efficiency through clustering would be prone to failure. Thus, should there be debates on ascertaining the appropriate level of policy intervention to reduce clustering in employment opportunities in areas of high resource advantage?

To conclude, tourism and hospitality clusters are evolving entities which constantly change their shape, size and characteristics over the span of their lifecycles. Despite the significance of cluster based approach to tourism development, very little empirical research has been conducted on spatial aspects of T&H employment clustering, particularly the mapping of spillover effects from a 'core' to neighbouring areas. Most traditional economic growth models were unsuccessful in fully explaining the continued and sustained nature of employment agglomeration. If the argument in favour of core-periphery tourism spatial

structure to best manage T&H services is acceptable, empirical evidence will be needed to support the rationale for implementing the cluster-based approach in tourism destination planning. The cluster theory therefore needs to be thoroughly scrutinised for its applicability in the context of T&H services planning before it can be transmuted into a public policy.

2.6 A TYPOLOGY OF TOURISM AND HOSPITALITY CLUSTERS

The purpose, function and geographic extent of T&H clusters vary. Some clusters are planned (for example, an industrial district), while others are more spontaneous and random (e.g. regional and services clusters). Some clusters operate at a street level, whilst others create a regional or even global presence. T&H clusters thus range from a micro scale, to meso or regional, through to a global or virtual scale. Figure 2.2 shows the five broad types of cluster to differentiate their geographic extent. These types of T&H clusters are discussed as following.

2.6.1 Tourism and hospitality micro-clusters

A micro cluster is a site-specific congregation of T&H firms in strategic tourism sites. Klepers (2010, p. 4) defines a micro-cluster as a ‘geographical concentration of a smaller number of firms in a cohesive local environment, where the complementary interaction between those firms contribute to an enhanced level of local specialization’. An example of a micro-cluster is a strip of nightclubs, hotels, and restaurants such as Kings Cross in Sydney or a biotechnology cluster in Parkville in Melbourne. T&H micro clusters are largely based on tourism attractions. Examples include the Philip Island attraction in Victoria, known for the Penguin Parade, which has attracted a large number of T&H firms to service the tourists visiting the site. T&H micro-clusters could also take the shape of gastronomic precincts such as Melbourne’s Lygon Street or Bridge Road precincts known

for hospitality services. Religious or pilgrimage sites, which hold sacred value, such as Banaras for Hindus, Lourdes in France for Christians, Mecca for Muslims, Jerusalem for Jews, are other examples of T&H micro-clusters. These tourism micro-clusters consist of a small to medium size firms, collaborating and coordinating within a relatively smaller geographical area.

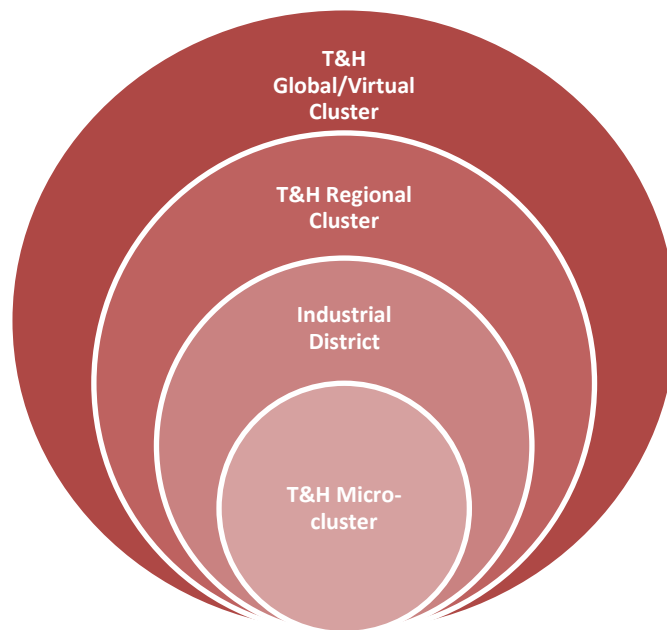


Figure 2.2: A spatial typology of tourism and hospitality clusters

2.6.2 Industrial cluster/districts

An industrial cluster, often associated with manufacturing, is larger than a micro-cluster in terms of its geographic size (Roelandt & Hertog, 1999). Industrial districts or clusters are often purpose-built to attract organisations using common basic technologies - such as biotechnology clusters - or utilising knowledge infrastructure to fulfil common demand or needs (e.g. eco-clusters) (Roelandt & Hertog, 1999). A typical industrial cluster includes interdependent firms, knowledge producing agents (e.g. universities, research institutes,

engineering companies), and institutions (e.g. broker, consultants) (Roelandt & Hertog, 1999).

Industrial clusters are traditionally established through land-use or industrial planning. They are also referred to as an industrial district – the area that occupies a designated part of a city. It is often assigned as an industrial zone. One vital strategy to attract firms to co-locate in an industrial district is the availability of subsidised industrial land or tax benefits. An Export Processing Zone (EPZ) is an example of planned industrial district, which offers a range of tax or custom-related benefits for export-oriented firms. Such special purpose planning regulations are also pertinent to the development and promotion of T&H clusters. Macau is one such example, which has become known worldwide as the ‘Monte Carlo of the Orient’. Gambling tourism is Macau's biggest source of revenue, which contributes about fifty per cent of the economy (Yang & Fung, 2009) The Las Vegas Strip (a stretch of South Las Vegas Boulevard in Clark County, Nevada) in the U.S. similarly attracts millions of tourists primarily for gambling, shopping, fine dining and nightlife. It is a congregation of mega casino-hotels and associated entertainment services. The gambling services are protected through the land use provisions to support the T&H industry.

2.6.3 Tourism and hospitality regional clusters

A tourism and hospitality regional cluster is typically a geographically extended industrial cluster. It is established when tourism growth from an industrial cluster begins to spill over the adjacent neighbouring areas. As a result, a more homogenous region specialising in a particular tourism pursuit is created. Enright and Kai (2000) examined the geographic extent of regional clusters through a survey questionnaire, which they conducted in America, Europe, Australasia (including Asia, Australia and New Zealand) and Africa. They explored

the respondents' views on what they consider to be a regional cluster. The found 95 per cent of respondents directly linked regional clusters to a city and its surroundings; whilst for others it spans much or most of a sub-national regional scale.

One of the most known regional clusters is the Silicon Valley, which is located in North California, United States. In 1951 Stanford Industrial Park was established which is now known as 'Silicon Valley', the world's high tech oriented park. The competitive advantages of Silicon Valley were due to its highly skilled pool of talents, proximity to savvy customers, and access to capital (Silicon Valley Information and Communications Technologies Study, 2011). Tropical North Queensland is one such example of a T&H regional cluster, which is built on the prime tourist attraction of the World Heritage listed Great Barrier Reef and Wet Tropics Rainforests, with the city of Cairns as an international gateway into the region. The Napa Valley, in the north of San Francisco Bay Area in the United States, is another example of a successful regional cluster. The Napa Valley, a wine growing area, attracts millions of tourists for vineyards visits and wine tasting tours. The Barossa Valley in Australia is an equivalent of the Napa Valley, which is also a well-known wine growing region in South Australia.

2.6.4 Tourism and hospitality virtual clusters

Virtual clusters (VCs), as first defined by Harrington (1991), were developed to capture the clustering of economic activities in a virtual space. Given the diminishing importance of physical space in a globalised world of production and consumption, T&H firms now have more choices to operate from any part of the world via the Internet. VCs have expanded traditional systems of innovation from a local/regional to a global level. It signifies a shift from geographical clustering to a virtual clustering (Romania and Passiante, 1997). This is

because of the use of internetworking technologies that enable the creation of new ‘virtual clusterisation’ (Passionate & Secundo, 2002). In a T&H virtual cluster, the suppliers, distributors, and service providers co-operate, collaborate and compete on a virtual space (Tapscott et al., 2000).

The examples of T&H virtual clusters include the web-based travel and leisure retailers such as ‘Agoda’, ‘Expedia’ ‘Wotif’ and ‘Webjet’, each of them operates a collaborative and integrated network of service suppliers in discrete locations. For example, using ‘Wotif’, a virtual travel portal based in Brisbane, a travel agent in Australia can book a hotel in Ho Chi Minh City in Vietnam, explore options for cheap flights in partnership with Singapore Airways, hire a car from Hertz, and incorporate scuba diving lessons as a part of the tour package in conjunction with a US-based tour agency for tourists from China. Tourists also could tailor and customise their own itinerary and create their own personalised tours, which involves engaging a number of service suppliers. Each supplier in the virtual T&H cluster adds value to the product or service through an exchange of digital information with other participants (Passiante & Secundo, 2002). The virtual environment provides more innovative and flexible ways to create personalised tourism products or services and thus help reduce the transaction costs (Davin & Botkin, 1994; Rayport & Sviokla, 1995).

2.7 TOURISM AND HOSPITALITY CLUSTER AS A SPATIAL CONSTRUCT

Tourism activities are attached to space and space often matters in shaping where, when and how tourists visit the places of attraction. Space also influences how businesses are organised and where T&H services are best offered. In this thesis, a tourism and hospitality cluster is therefore argued to be essentially a ‘spatial construct’ as space is identified as one of its key components. It holds an explicit location with embedded geographical attributes,

which underpin the locational behaviour of tourism and hospitality firms and employment. It is a spatial conglomeration of employment or firms in an optimal or a sub-optimal location to help gain the benefits of the economies of agglomeration.

One way to identify and measure spatial T&H clusters is to measure the spatial pattern, which reflects whether firms or employment is clustered or dispersed over space. Figure 2.3 illustrates the spatial clustering of T&H firms (as shown in red dots) within a geographic area. There are three key spatial patterns, which are described in Figure 2.2 as random, dispersed and clustered. It is to be noted that the firm density for all three distributions is much the same, which is nine firms per square kilometre. The key assumption of this proposition is that greater spatial clustering of T&H employment indicates a spatially agglomerated employment pattern in areas of strategic importance. However, whether those firms clustered within close proximity collaborate or compete largely remains unknown in any spatial analysis where data on inter-firm business transactions are not available. This research therefore focuses on mapping the tourism and hospitality clusters from a spatial perspective.

Spatial analysis enables spatial patterns of T&H firms or employment to be quantified. However, why these firms disperse or cluster requires further examination of the decision-making processes at a firm level? This raises the second set of research questions that aim to explain the role of spatial processes that create the favourable business environment for firms to grow and thrive if they cluster. It is argued that the decision to cluster for T&H firms *vis-à-vis* employment is about the location choice. Such decisions are partly attributed to spatial differences in location-specific resource endowments such as the presence of a tourist icon or high access to a highway. Spatial processes may not necessarily create

clusters, but they certainly shape where and how they develop and evolve. Fundamentally, spatial processes create spatial structures such as accessibility to public transport or levels of household income, which influence, if not control, the agglomerative behaviour of T&H employment.

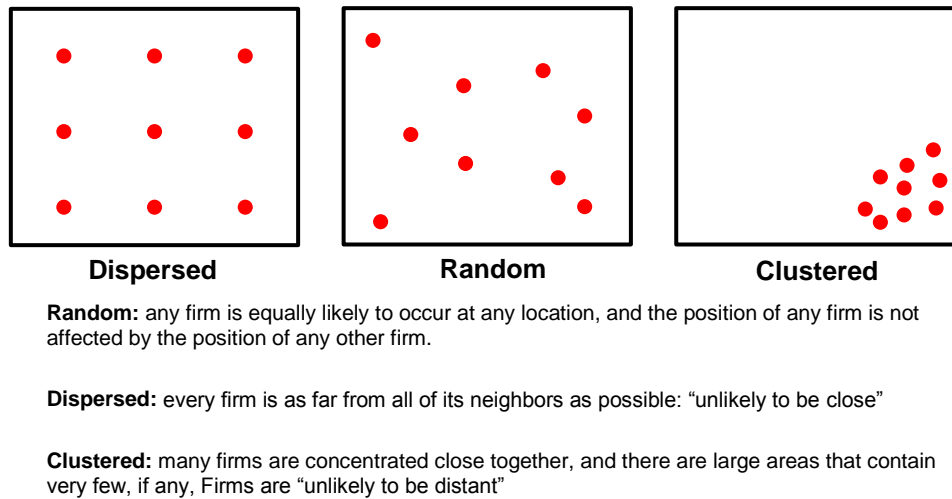


Figure 2.3: Spatial patterns of tourism and hospitality firms (dots represent individual firms)

Agglomerative economies are operative when centrifugal forces such as access to skilled labour or the proximity to market are strong. This, in turn, creates more spatially concentrated employment behaviour. ‘Diseconomies of scale’ however start to operate when centripetal forces, such as congestion or overheated land value, disperse employment and create randomised spatial patterns with no specific order or spatial arrangement. This thesis therefore begins with mapping spatial concentration of T&H employment and then proceeds to examine the role of spatial processes, represented through location-specific attributes, in driving the localisation behaviour of T&H employment.

The attempts to geographically delineate T&H clusters are largely rare. There are few recent studies (Canina et al., 2005; Hall, 2005; Michael, 2003), which have examined the spatial

aspects of the T&H industry. However, they employ techniques, which were either qualitative or applied less sophisticated techniques such as a simple density map. The importance and difficulties of mapping and modelling T&H clusters were raised in a number of recent studies. For example, Laperche et al. (2011, p. 22-23) noted the difficulty in defining ‘what a cluster really is and what its spatial geographical boundaries could be’. As stated by Martin and Sunley (2003, p. 10) ‘there is a chaotic use of the term cluster’, which often conflate and equate economic localisation to quite different type of processes and spatial scales. Held (1996, p. 249) argued that ‘the notion of cluster remains rather fuzzy in its theoretical “contours” and its meaning is frequently confused with many other notions or concepts which are supposed to be “neighbouring”’. Ellison and Glaeser, (1999) also agreed there are difficulties surrounding the proper conceptualization of a cluster; except that it is a ‘non-random spatial concentration of economic activities’ (p. 314).

Novelli et al. (2005) identified two main reasons that thwarted the identification and delineation of T&H clusters. *Firstly*, because it is a service industry with strong inter-industry linkages and *secondly* because it largely consists of small and medium enterprises with a nebulous spatial footprint in comparison to corporatized production spaces (Novelli, et al. 2005). A car manufacturing production unit with its suppliers located in close vicinity provides a good example (Novelli et al. 2005). Production spaces are categorically explicit because of their infrastructure layout (Novelli et al. 2005). The tourism industry often requires supporting services and products from other closely related industries, such as outdoor equipment, design, transportation, and food and beverage, which are often dispersed in discrete locations. This in turn restricted the clustering tendency of T&H firms which could operate from least-cost locations instead of the local ambiance of a ‘tourist destination’. Given these challenges prohibiting the application of cluster-led tourism

planning, this research aims to develop a spatial methodology that identifies, characterises and measures spatial T&H employment clusters *vis-à-vis* the processes that stimulate clustering of employment.

2.8 SUMMARY

This chapter has defined and discussed the basic concept of a T&H cluster. A typology of clusters, based on the geographic extent, and their characteristics were presented with notable examples. It established the context through which the concept of T&H cluster, as a spatial construct is conceptualised, identified, measured and spatially delineated in this research. It highlighted the importance of examining the spatial processes that underpin the propensity of spatial clustering of T&H activities in areas of strategic advantage. The localisation or geographical agglomeration of T&H firms or businesses is the key characteristic of a typical cluster and will remain a core focus in this research. Other characteristics of the cluster concept such as value-adding chains of interrelated and interdependent firms and institutions or partnerships and alliances through building trust, informal contacts and social capital are not necessarily considered when constructing the T&H cluster.

This chapter concludes with the following statements:

- Tourism and hospitality cluster, both theoretically and methodologically, is a complex concept. It has multiple meanings, numerous types and spatial scales, and discipline-specific interpretations. There is still no single definition that is agreed upon that incorporates the diversity of opinions, arguments and characteristics of cluster. Notwithstanding, the co-location of firms and employment remained a key common dimension in all cluster concepts regardless.

- The tourism and hospitality clusters are essentially demand-driven services nodes of interdependent, yet discrete firms within a single industry, which are heavily dependent on localised and destination based resources to support services to tourists and residents.
- A tourism and hospitality cluster is argued as a spatial construct because of its location-specific attributes. An analysis at an aggregate level is appropriate to identify the key T&H employment concentrations; and the location-specific contextual conditions within which a conducive business environment is created for firms and employment to co-locate.

The next chapter will introduce the cluster theory and the factors that drive the creation and development of clusters.

CHAPTER 3

TOURISM AND HOSPITALITY CLUSTERS – A

THEORETICAL FRAMEWORK

3.1 INTRODUCTION

Chapter 3 establishes a theoretical framework for modelling the spatial clustering of T&H employment. This chapter begins with a description of the historical evolution of cluster theory and its various theoretical perspectives that underpin the location, scale, and characteristics of tourism industry clusters. It then establishes a spatial modelling framework that identifies the underlying location-specific drivers of T&H employment clusters. Specifically, this chapter addresses the following three research questions:

- What is a cluster theory and how has it evolved over time?
- What are the theoretical perspectives and the underlying principles that explain the spatial clustering of tourism and hospitality employment?
- What are the key location-specific factors that drive the tourism and hospitality employment clustering?

3.2 DEVELOPMENT OF CLUSTER THEORY

Cluster theory, in simple terms, is about explaining the process of creating a conducive business environment, which encourages firms, organisations and institutions to agglomerate in a geographically bounded area of strategic importance to achieve economies of agglomeration. The intellectual antecedents of clusters date back as far as the late 1800s when Alfred Marshall (1890) propounded the concepts of externalities of specialised industrial locations and ‘agglomeration effects’ (Marshall, 1890, 1920a; Motoyama, 2008). The traditional models in economic geography and regional economics such as ‘growth poles’ (Perroux, 1950); ‘industrial districts’ (Pyke et al., 1990; Sabel, 1989), and ‘local production systems’ (Abdelamalki & Courlet, 1996; Pecqueur, 2000) on the production side, and ‘technopoles’, technological districts and innovating milieu (Aydalot, 1986; Maillat & Perrin 1992) in the field of innovation all preceded the idea of cluster. Earlier

classical theorists such as Weber's industrial location theory (1929) also identified a significant reduction in transport costs when firms agglomerate at an optimal location using the concept of 'isodapane'. Earlier work by the famous regional geographer Vidal De La Blache, in his *Principles de Geographie humanism* published posthumously in 1921, also reported the clustering of economic and social activities, where industries or people get together to benefit from the advantage of spatial division of labour. Schumpeter (1934) also highlighted the enabling role of clustering in innovation and the role of entrepreneurs and the 'creative forces of destruction' (Johnston, 2003, p. 6). In 1926, Robert Murray Haig undertook an in-depth analysis of the factors that foster the tendency of co-location of firms and industries in New York. The garment industry was chosen as an exemplar to examine the clustering tendency of designers, fabricators and marketers to gain improved access to a greater pool of customers and common resources through face-to-face interactions within a local area (Johansson & Quigley, 2004; Press, 2006).

Despite such a long history, there is however no single unified cluster theory; it is rather a collection of ideas, concepts and theories, which have provided the logical formulation of geographic clustering of firms (Fesser, 1998; Brown, 2000). In this section, the historical evolution of cluster theory is mapped out to demonstrate the richness of this field, simultaneously highlighting the vitality of spatial theoretical perspective in explaining the agglomerative behaviour of the T&H industry. Broadly, there are three major eras that illustrate the genesis and development of cluster theory. As shown in Figure 3.1, the transitioning of cluster theory from one era to another is based on the shift in the predominant paradigm and the line of enquiry. These eras are discussed as follows.

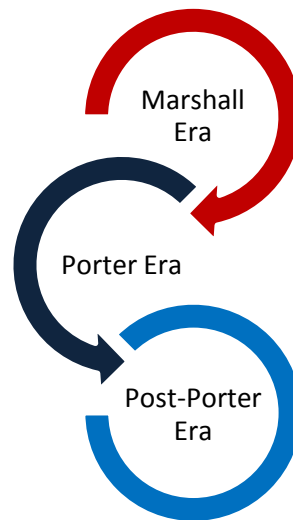


Figure 3.1: Historical evolution of cluster theory

3.2.1 The Marshall Era

The Marshall era adopts an economic perspective to explain why firms cluster in strategic locations. Much of the work in this era focuses on reducing the production and/or distribution costs through harnessing the benefits of agglomeration economies. The Marshall era started in the late nineteenth century when Alfred Marshall (1890) presented an economic argument in the *‘Principles of Economics’* to explain the phenomenon of spatial concentration of economic activities using the ‘external economies of scale’ concept. Agglomeration is often explained by ‘external economies of scale’, referred as ‘externalities’. In simple terms, externality is a benefit or cost which impacts on a producer who did not choose to incur that cost or benefit. Marshall (1920a) considered external economies of scale different to internal scale, which is achieved when a firm increases production and reduces costs. It is different to ‘internal economies of scale’, which is achieved when a firm increases production that in turn reduces costs. External scale occurs outside a firm by increasing the scope of operation to benefit from factors such as better transportation services, access to a joint pool of skilled labour, lower search cost, local intra-

industry specialisation and availability of local specialised services (Gordon and McCann, 2000; Simmie, 2005).

Marshall asserts that clustering of companies in close vicinity to one another results in many business advantages. He referred to ‘externalities’ as a ‘trinity of agglomeration’, which includes – ‘the local pool of skilled labour’, ‘the local supplier linkages’ and ‘the local knowledge spillover’. The cotton industry in Lancashire was one of the earliest cases where ‘manufacturers, users of machinery, producers, and traders of textiles were encouraged to co-locate within the area to undertake highly standardised and mechanised practice’ (Marshall 1919, p. 599). The externalities were achieved through local concentration of customers and suppliers to gain economies of scale. Marshall identified positive ‘agglomeration externalities’, which he explained using four major principles (see Figure 3.2). These include:

- i) access to specialised labour,
- ii) access to specialised inputs,
- iii) access to technology spillovers and
- iv) access to greater demand.

Marshall ascribed the externalities for creating a cluster that involves, *firstly* the ‘mass production’ to achieve ‘internal economies’ (which is identical to scale economies); *secondly*, the availability of specialised input services; *thirdly*, the formation of a highly specialised labour force (i.e. trained and skilled workers) and the production of new ideas, both based on the accumulation of human capital and face-to-face communication; and *fourthly*, the better utilisation of existing infrastructure such as road and rail (Fujita & Thisse, 2002). However, after 30 years Marshall recognised the impact of rapidly changing production technology under a newly corporatized industrial system that increased the

importance of internal economies and reduced the role of local suppliers and resources (Marshall, 1919). Ohin (1933) and Hoover (1937, 1948) extended the work of Marshall to further explain the advantages for firms to agglomerate. They added other plausible explanation of agglomeration economies such as economies of scale and scope within the firm, access to more diversified labour markets and specialised skills, increased interactions between local suppliers and customers, saving of transport costs and shared infrastructure (Bekele & Jackson, 2006). The shared infrastructure created clustering of firms including the fishery industry in Nelson (New Zealand), cargo services industries of Hong Kong and Singapore, the chemical industry of the US Gulf Coast, and the flower and food industries of the Netherlands.

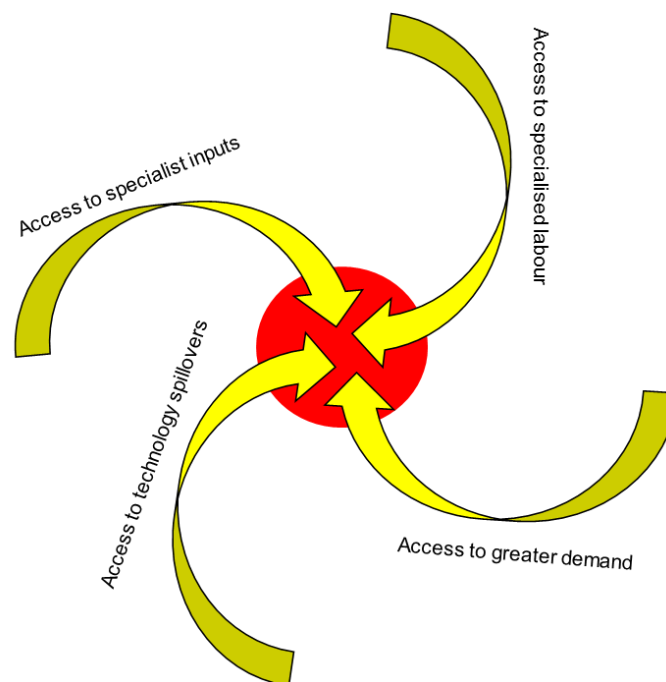


Figure 3.2: Agglomeration externalities (Marshall, 1919)

Most concepts of cluster appear to have their roots to a more or lesser extent in agglomeration theory (Hofe & Chen, 2006). Agglomeration is a ‘concentration of economic activity in space, in the most general sense defined as the locus of heightened economic activity’ (Press, 2006, p. 7). The concept of agglomeration was first documented in 1948 by

Hoover, who explained agglomeration as a process of creating inter-firm relations and linkages within an explicit geographic boundary that in turn generate agglomeration effects. Agglomeration economies provide two sources of efficiency gain (Florax & Plane, 2004). The first is attained through increased diversity of products, which are readily available and exchangeable within the agglomeration. The second is the incentive for firms to co-locate to reduce forward and backward transactions and transportation costs. It is particularly critical for products whose transportation costs increase more rapidly with an increase in distance. The decision to buy (i.e. manufacturing) from outside or within the cluster could impact transaction costs. For example, Johansson and Karlsson (2001) state that interaction costs are much lower for transactions within a region than between regions. This implies that ‘contact-intensive products’ have distance-sensitive transaction costs (*ibid*). They argue that these transaction costs rise abruptly when a transaction passes a regional border.

Subsequent work on growth pole theory became the basis of cluster theory that highlighted the importance of ‘growth poles’ in creating and accelerating industrial interdependencies and linkages among industries. The need to invest in propulsive industries at planned growth pole was proposed as an argument to accelerate economic growth in a region and subsequent spillover effects in the latter stages of growth cycle. As a result, industrial complexes were developed with the aim to establish inter-firm input-output trading linkages (Isard et al., 1959, Latham 1976, Czamanski and Ablas, 1979 and Howe, 1991). Current development on cluster theory draws heavily from this strand of work in regional science and economic geography.

Recent literature on cluster theory that extends the work of Marshall however focuses on linking agglomeration economies to knowledge spillovers and diffusion of innovation such as ideas, technology or creativity. This strand includes the Marshall-Arrow-Rower (MAR) literature (Glaeser et al., 1992) that emphasises the analysis of a single localized industry,

wherein the focus is on the process of ‘learning-by-going’. MAR literature highlights the importance of ‘local monopoly’ in strengthening a firm’s competitive positioning and fostering innovative growth through enabling technology externality to be internalised within the cluster. McCann and Folta (2008) categorised the key benefits from agglomeration economies. They differentiated the spatial concentration of diverse or similar firms. Urbanisation externalities explain the benefits of spatial agglomeration of diverse firms often in a large urban setting to reap the advantages of inter-industry knowledge spillovers (Chinitz, 1961; Jacobs, 1969, 1984, Lowe et al., 2006). In contrast, when firms operating in a same value chain segregate, they gain endogenous benefits from specialisation through localisation externalities. The locational externality is similar to the concept propounded by the Marshallian genre, such as Marshall (1919), Ohlin, (1933) and Hoover (1937, 1948).

3.2.2 The Porter Era

The cluster theory came into prominence when Porter consolidated various concepts of clustering. The cluster acclaimed its application in 1994 by Porter when he published his first paper specifically related to the cluster and the role of location (Porter, 1994). According to Porter (2000, p. 16), a cluster is a ‘geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities’. He conducted a systematic analysis which recognises that companies cooperate and simultaneously compete to generate wealth when located within a geographic area. His theory gained popularity partly because Porter presented cluster theory not only as a theoretical concept, but also as a policy tool (Martin & Sunley, 2001).

Porter (2000) argued that the industry clustering is a business strategy that enhances greater inter-firm collaboration as well as increased inter-firm competition through a mechanism of agglomeration of firms. Clustering tends to improve productivity through harnessing the complementarities between the activities of cluster participants. These include complementary products for the buyer, due to a better cluster standards and measures. The core argument that he presented for agglomeration is to increase productivity, higher wages, and opportunities for innovation through gaining better access to specialised inputs (e.g. parts and components, business services). He argues that more dispersed industrial activities require vertical integration and procuring inputs from remote areas with incur higher transportation and labour costs.

Porter (2000) developed ‘a diamond model of cluster’, which identifies salient conditions that favour the creation and development of industry clusters. Porter identified four mutually interactive conditions, which potentially shape the performance of a cluster. These include:

- *Factor Conditions* refers to the capacity of a region in terms of factors of production necessary to compete in a given industry. These factors can be either basic (e.g. natural resources, climate, location) or advanced (e.g. skilled labour, infrastructure, technological know-how). The region which has advantages over these factors, such as highly skilled workforce, the availability of tourist attractions, or more developed transport infrastructure, is more likely to attract industries and resources from government to generate a more vibrant cluster.
- *Demand Conditions* refer to the size of local or regional demand for products or services in a particular industry. The local demand helps developing capabilities and increase pressure on firms to be competitive. The demand condition occurs when the local market for a product is greater than the demand outside the country. This not

only emphasises the firm to produce efficiently, but also being more innovative and competitive in comparison to domestic firms striving to export the same product outside the market or to other countries. Japan which has more demand of electric and electronic products within the country, which is partly the reason that electronic companies are within Japan.

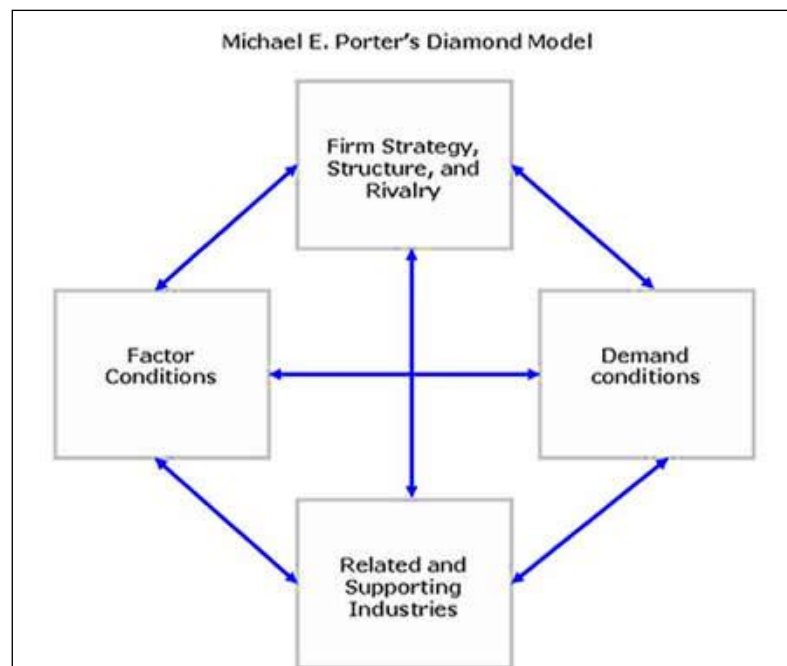


Figure 3.3: Michael E. Porter's Diamond Model

- *Related and Supported Industries* refer to the presence or absence of suppliers and related ancillary industries. The presence of suppliers that are internationally competitive can spill over and contribute to other industries. They also help to develop a more integrated value chain.
- *Industry Strategy and Rivalry* refers to the conditions governing how companies are created and organised, and how the domestic rivalry among them is managed. Vigorous domestic rivalry creates greater pressure on firms to innovate, to improve quality, to reduce costs and to invest in upgrading commonly shared infrastructure.

These conditions support (or inhibit) cluster development by creating common goals, supporting shared needs and promoting collectivism and inter-firm cooperation.

In the revised version of the earlier diamond model (see Figure 3.4), Porter (1990a) added ‘chance’ and ‘government’ as additional interactive constructs, which impact on the cluster development process. These two new constructs incorporate the element of uncertainty in decision-making and the role played by government. Government policies such as regulation, tax or product standards can affect demand and thus the competitive advantage of firms. Porter however maintained his position that the role of government in cluster development should be minimised. The unnecessary government interference could influence the competitive advantage of firms and subsequently impact on cluster development, as Porter argued.

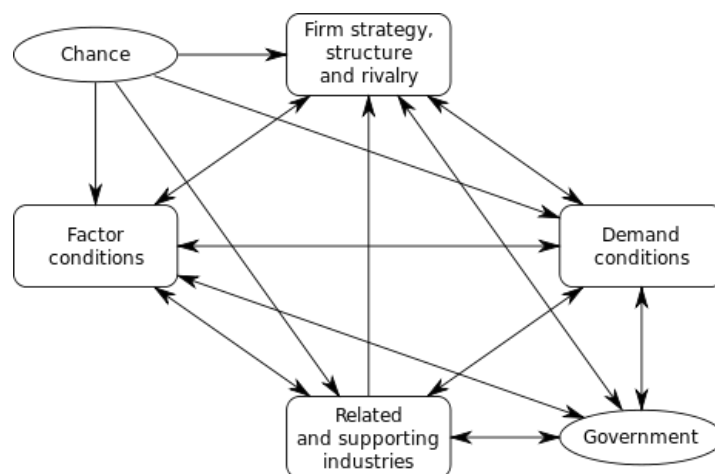


Figure 3.4: Revised version of Porter’s Diamond Model (1990, p. 127)

More recent work of Porter (2003) however asserts a dwindling effect of local clustering in the globalised world economy. Firms’ interconnectivity within a cluster no longer remains as a source of competitiveness. Access to global markets, rapid transportation, and high-

speed communication permit organisations to procure goods and services from any place at any time (Porter, 1998, 2003).

3.2.3 The Post Porter Era

The post-Porter era represents an emergence of more diversified approaches towards cluster theory. Clusters are conceptualised as innovation nodes where the value add of co-location are building trust, relationship and social capital. It represents the beginning of new era of production systems – a shift from the Fordist to post-Fordist economy. A move has occurred from a rigid mass production with a particular focus on economies of scale to a more flexible system of individualised consumption. This perspective flagged the emergence of globalisation of production and consumption systems and the subsequent horizontal disintegration of production processes across multiple locations. This transformation marked an increased externalisation of production processes with greater engagement through outsourcing and subcontracting to smaller, more specialised and flexible firms (Bekele & Jackson, 2006). Thus, the research in this era is different from the era of Marshal that over-emphasised the benefits of agglomeration economies through getting greater access to collective resources and common infrastructure and reduced transportation costs.

In the post-Porter era, the focus is placed on explaining ‘untraded interdependencies’. The purpose of co-location is therefore argued to facilitate sharing of local knowledge and learning from each other to enhance the capacity of local area to innovate and then lead. Technological externalities emerge from the greater concentration of firms using similar technology and abilities to develop a shared repertoire of codified, tacit and even un-codified knowledge. The benefits of technological externalities include technological information and knowledge spillovers, increased absorption and speed of technological

upgrading, technological complementarities, reduction of technological investments, sunk cost, and access to tacit knowledge (Antonelli, 1994, Belussi, 1999, Belussi & Arcangeli, 1998). Clusters are perceived as foci of innovation and the means of upgrading productive capacity as dynamic processes. The underlying idea is to create a learning network through which a more coordinated interaction between producers and consumers could occur. In that sense, the efficiency and efficacy through which knowledge is generated, diffused and applied within the cluster become the focus of the approaches under the post-Porter era (Roelandt & Den Hertog, 1999).

3.3 THEORETICAL PERSPECTIVES ON CLUSTER THEORY

A range of perspectives are developed to theorise the formation of clusters. For example, Gupta and Subramanian (2008) have identified seven theoretical perspectives, which capture different approaches to cluster development. These perspectives represent transitioning through three broad research paradigms. 'Geography' transitioned to 'new geography', wherein the focus of cluster research shifted from 'scale economies' to reducing 'transaction costs'. 'Global linkages' has replaced the 'learning enabled regional linkages' in Porter's diamond synergies. 'Local regional innovation systems', which dominated cluster research in the 1990s, has also shifted from 'regional networks' of inter-firm relationships to establishing more 'specialised global linkages'. As argued by Gupta & Subramanian (2008), a new perspective, referred to as a 'transitional value chain', has emerged, wherein the lead global firm collaborates with the local firms supported by local institutions. The lead firm thus gets seamless access to local resources and knowledge, which, in turn, help create a successful local cluster of global significance. More recently, Bekele and Jackson (2006) have categorised cluster-related studies into six different

theoretical perspectives, each focusing on a distinctive line of enquiry. These are now discussed.

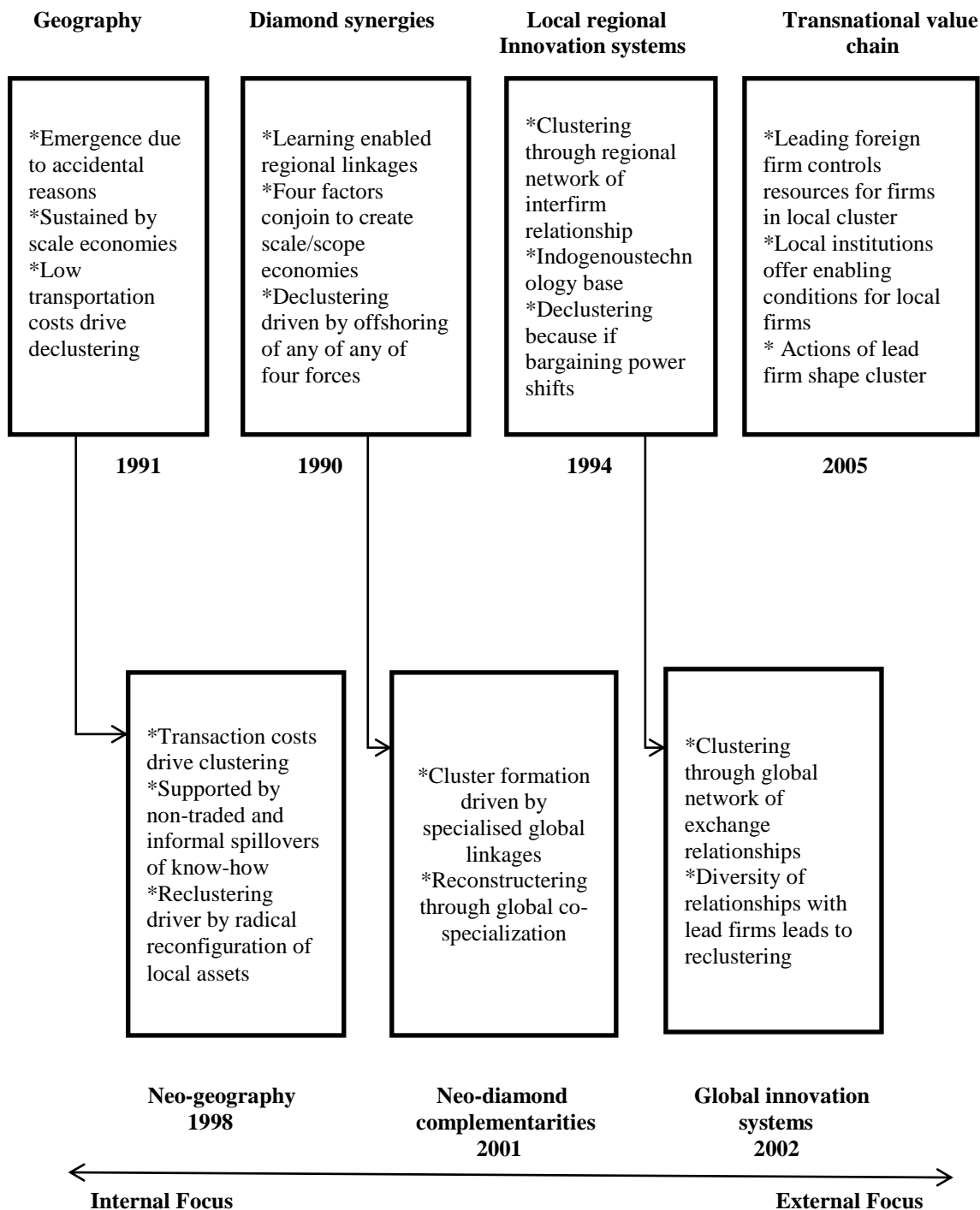


Figure 3.5: Seven perspectives on clusters. (Gupta and Subramanian, 2008)

3.3.1 The classical agglomeration perspective

The classical agglomeration perspective includes the work of Marshall (1890), Weber (1929), Ohlin (1933) and Hoover (1937). The major focus of this perspective was on explaining the cost advantages of ‘external economies of scale’, when firms locate near one another in cities and industrial clusters. Classical agglomeration perspective emphasises the importance of transaction costs reduction and building collaborative relationships through sharing technologies, labour, resources, and customers or distribution networks. Transaction costs are generally consisting of two major components: coordination costs and transaction risk (Coase, 1937; Clemons et al., 1993). Transaction costs can be measured as a function of three factors: search and information costs, bargaining and decision costs, and policing and enforcement costs (Dietrich, 1994).

Cluster concept has been argued as a means to minimise coordination costs and reduce transaction risk. Firms within a cluster would be able to readily search for information, get access to skilled labour, and procure capital. These firms would also be able to bargain that in turn help reduce decision costs. There would also be less effort required, which will help achieving economies of effort, which reduces the number of contacts required in a transaction. Furthermore, the policing, compliance and enforcement costs, which are parts of transaction cost, would also be rationalized when firms segregate in a location.

3.3.2 The flexible specialisation perspective

The flexible specialisation perspective, as adopted by Brusco (1982), Piore and Sabel (1984), and Scott (1988), highlights a shift from a rigid mode of production to a flexible form of industrial organisation. It represents a move from a regimented system of ‘mass production’ with a particular focus on economies of scale to a more flexible, just-in-time

production system that places greater emphasis on mass-customisation. This perspective highlights the need to re-contextualise the meaning of cluster in a more fragmented global production system wherein the business processes are horizontally and vertically integrated. Therefore, the spatial fragmentation of production and an integration of business processes through the efficient use of new technologies give rise to a strong base to challenge the basic tenet of cluster theory, that is – the localised accumulation of economic activities reduces transaction costs and enhances business value.

3.3.3 The dynamic externalities perspective

The dynamic externalities perspective places greater emphasis on specialisation. When externalities operate on specialisation, firms specialise in one economic activity (e.g. single industry) or closely connected set of activities within the same value chain (e.g. car manufacturing). This refers to ‘Marshall-Arrow-Romer’ (MAR) externalities in dynamic context (Junius, 1997). This perspective includes the work of Lucas (1988), Romer (1986), Glaeser et al., (1992), and Henderson et al., (1995). MAR externalities are related to intra-industry spillovers, whereby the co-location of firms enables rapid transmission of new ideas and innovations between firms within a cluster, which, in turn, helps in knowledge-spillovers. The cost advantages and external effects associated with knowledge spillovers within an industry are referred as ‘dynamic externalities’ (Glaeser et al., 1992). While in a large urban setting, a more diversified pool of industries operates in dynamic context to avail ‘urbanisation economies’, which is referred to ‘Jacob’s externalities’.

The dynamic externalities perspective argues for incorporating the historical and dynamic nature of spatial accumulation of economic activities. Areas evolve over time and build a stock of location specific knowledge, accrue resources, and invest on assets, which allow

firms to anchor their growth prospects on existing resource endowments. This perspective challenges the static view of classical agglomeration theorists on externalities. In areas where dynamic externalities are stronger, there is no additional incentive for firms to transfer to a location with no history of an industry, and no built-up stock of knowledge (Henderson et al., 1995). An important argument of MAR externalities is that ‘local monopoly’ rather than competition is more beneficial for growth; whilst Porter argues that ‘local competition’ encourages firms to innovate to remain competitive.

3.3.4 The competitiveness perspective

The competitiveness perspective presents the cluster-based approach as a business strategy to increase competitiveness of firms through simultaneously combining inter-firm cooperation and rivalry. This perspective emphasises the significant role of market, wherein a cluster typically represents a group of businesses, linked by customer-supplier relationships. Clusters are analysed for their ability to build business relationships and networks. Firms within a cluster are more competitive in their ability and performance to compete in a given market, in relation to the ability and performance of firms outside the cluster. Clustering is also linked to productivity improvement through ‘complementarities’ between cluster participants. Contrary to MAR, Porter proposed the competitiveness perspective that highlighted the importance of regional specialisation. The key argument is that local competition instead of local monopoly produces a business environment more conducive to increased innovation, competitiveness and economic growth.

3.3.5 The regional innovation system perspective

The regional innovation system perspective considers clustering to be driven by the desire of firms to share knowledge and to promote collective learning. Clusters create an ambiance

for open innovation, which presents opportunities for cluster members to collaborate. The key argument of regional innovation system perspective is that the local industrial cluster not only triggers growth spillover and inter-firm exchanges but also stimulate learning and innovation. The advocates of this perspective include Lundvall (1992), Cooke and Morgan (1998), and Malmberg and Maskell (2002).

The 'regional innovation systems' considers clusters as a source of innovation and localised knowledge. The Silicon Valley is one such example, which consists of a well-connected and flexible set of knowledge nodes. In the Silicon Valley, there is greater cooperation due to stronger social ties and trust among cluster members (Gordon & McCann, 2000). Establishing informal linkages and embedding collective efficacy for finding solutions of common problems within a closely knitted cluster network is the core driver of the regional innovation system of the Silicon Valley (Delbridge & Edwards, 2007).

Clusters are conceived as foci of innovation and learning nodes, where the ability to learn is decisive for the economic success of individuals, firms, and regions. The importance of intangible aspects of knowledge creation, sharing of tacit knowledge and learning networks within a cluster are recognised as key components of a regional innovation system. A cluster facilitates the creation and management of knowledge base as a collective, interactive and cumulative learning process for cluster members. This, in turn, leads to new settings of resources, competencies and skills. Clusters transform into learning hubs to distribute knowledge and promote continuous improvement through learning from other actors within the cluster network. It also enhances the networking capability of cluster members to build interactive business networks towards effective utilisation of the resource.

3.3.6 The spatial theoretical perspective

The spatial theoretical perspective considers a cluster as a geographic phenomenon, reflected in terms of location, place or centre with a critical mass of agents (e.g. companies, research centres and education institutes) operating in a given field. This perspective is also referred as New Economic Geography (NEG). The proponents of NEG, such as the work of Fujita et al., (1999), and Fujita and Thisse (2002), consider the spatial clustering of economic activity as an inherent characteristic of space economy. NEG provides a new perspective to general equilibrium theory of industry location that explains why, how and when economic activities cluster in geographic space (Thisse, 2011).

The spatial theoretical perspective provides a new insight on spatial restructuring of economic space. As such the development of clusters of high economic activities in a geographically bounded area is not random; it is subjected to two opposing forces. Fujita and Thisse (2002, p. 5) referred to these forces - ‘centripetal’ (or agglomeration) and ‘centrifugal’ (or dispersion). These forces generate simultaneous push (e.g. congestion) and pull (e.g. reduced transport costs) to attract or dispel firms, consumers or employees to or from a particular location respectively. The complicated balance between centrifugal and centripetal forces determines the levels of spatial clustering of economic activity. Centripetal forces pull economic activities to a location; while centrifugal forces push (or disperse) these activities further away. Simultaneous interaction of these forces strives to attain a general equilibrium that fundamentally shapes the scope and trajectory of clusters (Krugman, 1998, p. 3).

In this thesis, a spatial theoretical perspective is argued to examine the spatial T&H employment clusters. The key focus of spatial perspective is to identify and spatially

delineate the geographic extent of T&H clusters as well as estimate the impacts of location-specific attributes of geographic space on these clusters. The spatial theoretical framework for modelling the T&H employment clusters is presented in the following section.

3.4 A SPATIAL THEORETICAL FRAMEWORK FOR TOURISM AND HOSPITALITY EMPLOYMENT CLUSTERS

The geographic space plays a vital role in shaping the spatial T&H employment clusters. The modelling on T&H employment clustering at an aggregate level therefore necessitates adopting a spatial modelling approach, which takes into account the location-specific impacts. Most economic studies however have empirically modelled the growth determinants of firms within a cluster, but only a few studies (Doeringer & Terkla, 1996; Johansson & Forslund, 2006) estimated the effects of locational attributes on firms' choice to co-locate. It is important to examine the relationships between the attributes of geographic space and T&H employment by analysing the key mechanism by which locational factors augment or deter the clustering of T&H employment.

As explained in Chapter 2, T&H employment clusters are essentially demand-driven service nodes, therefore they are heavily dependent on localised and destination-based structures to support services to tourists, visitors or residents. As noted by Arbia (2001) 'until relatively recently, location and physical geography characteristics have been regarded as irrelevant factors in many economic theoretical studies' (p. 411). Lundberg (2006) also stated the increased interest in recent years for incorporating the spatial effects in empirical analysis of regional growth. Studies including Enright (1991), Krugman (1991) and Doeringer and Terkla (1996) also provide insights on why and where industry clusters and how they evolve over time. Their studies explored the economic, geographical and sociological rationale of

localisation. Johansson and Forslund (2006) modelled the locational behaviour of firms, where ‘firms cluster at a particular location in order to take the benefits from the available resource endowments, presence of input suppliers and better access to common pool of customers’ (p. 3). However, there are some clusters which have developed at a specific location as a result of a ‘historical accident’ (Doeringer & Terkla, 1996).

As argued in Chapter 2, a T&H cluster is a ‘spatial construct’, which essentially expands or shrinks in response to ‘external environmental stimuli’. These stimuli are often associated with ‘locational externalities’. The key focus of this research therefore is on establishing the association between ‘locational externalities’ and the scale of employment clustering. Localisation externalities are location-specific advantages/disadvantages and are largely related to cost advantages associated with initial resource endowments or access to immobile resources. For instance, firms of the same part of the industry take the advantage of being located in close proximity to one another to avail the benefits of information spillovers, access to a joint pool of skilled labour, lower cost of search and matching in labour and service/product markets, local intra-industry specialisation, and availability of local specialised services (Gordon & McCann, 2000; Simmie, 2005).

The tourism industry is often built around availability of tourism resources. These include natural attractions (e.g. climate, landscape, and ecosystem) or cultural attractions (urban heritage, arts, museum, folk craft). Tourism resources also include hotel, motel, camping, or recreational facilities. The availability of T&H resources is the key catalyst for spatial concentration of employment. T&H firms agglomerate in areas that have a natural or cultural advantage (Ellison & Glaeser, 1999). This propensity to cluster is much stronger for firms, which offer services that are highly sensitive to cost differences (Bartik, 1985;

Carlton, 1983; Henderson, 1997). Wine tourism tends to cluster in areas close to the source of resources. The Grand Canyon, a steep-sided canyon carved by the Colorado River in the United States, which is a nature based tourist attraction is known for its unique geomorphological formation. Victoria Falls (or Mosi-oa-Tunya) on the Zambezi River at the border of Zambia and Zimbabwe attract a large volume of tourists, which necessitates T&H services to conglomerate in the region.

Firms also cluster in close proximity to markets. The textile industries of Prato and Kyoto area, the pharmaceutical industry in the New Jersey area, and the auctioneering and insurance industries of London are typical examples where firms congregate close to markets to access areas of consumption and to fulfil the Just-in-Time demand. T&H markets could be accessed regionally or globally. Larger metropolitan cities such as Sydney and Melbourne supply a large pool of domestic visitors to their respective hinterlands. They are also the gateways through which international tourists have access to key national and state destinations. However, the size of population is a surrogate for representing the demand for tourism and hospitality services, only if the population has the disposable income or a lifestyle to spend on those services. Greater accessibility to these large metropolitan cities is often a key factor in providing the minimum threshold demand needed to create and sustain large T&H clusters.

The T&H industry tends to disperse with distance from the key employment hub, such as a Central Business District. Cities offer abundant opportunities to achieve successful economic outcomes (Church & Frost, 2004), owing to their ‘density, diversity and openness to change’ (Gordon, 2005, p. 2). Glaeser (2010) and Krugman (1998) reported substantial wage differences across different regions, which explain the reason for employment

agglomeration. Generally, workers get higher wages in larger cities. Firms are willing to pay more wages to workers. Firms are more likely to achieve their profit targets in cities due to the benefits of agglomeration economies. Otherwise, firms would not be congregated in larger cities such as New York, London, Tokyo or Berlin unless those cities were robust enough to bear the additional labour or land costs (Krugman, 1991). Furthermore, density and high wages are often correlated. A strong relationship between area employment density and per capita gross metropolitan product (GMP) is being noted.

The availability of labour is another key factor that plays a significant role in T&H employment clustering (Szivas et al. 2003). It refers to the access to workers, or knowledge, which helps reduce the cost for information search (Combes & Duranton, 2006). Labour market externalities relate to benefits accrued by the creation of pools of specialised workers, who obtain cluster-specific skills valuable to the firms. Agglomeration economies decrease the risks of labour market flexibility as new jobs can be found more easily and when required. Clusters could also provide opportunities to match job demand and supply of labour as to co-exist within a confined geographic area to enhance the functioning of the labour market. It allows higher levels of ‘specialisation efficiency’ through which the skilled workforce can be readily accessed in close proximity to the market. It also allows efficient functioning of labour market through minimising ‘leakage’ of specialised skills to other areas or industries of high demand (e.g. mining industry). This in turn will help reduce area-specific labour shortages.

The accessibility to local amenities is the key factor promoting spatial accumulation of T&H employment (Hall & Page, 2006). Greater transportation accessibility to tourist destinations is vital for tourists’ mobility. Transportation infrastructure includes the availability of

highways and freeways, rail networks, connection to national and international destinations through airports and ports, and the frequency and costs of travel. Accessibility is important because of the distance decay effect by which the majority of leisure tourists undertake travel in the urban hinterland on a day tour basis; the number of overnight stays and travel declines as a function of distance in relation to the source region (Hall, 2006). The notable exception to such a situation is the existence of specific purpose resorts (i.e ski resorts) or desirable amenity locations such as coastal or mountain area, which provide a focal point for tourism related mobility in non-urban areas (Müller 2006; Lundmark, 2006). Pearce (1998) gives several examples of the presence of the ‘funnelling effect’ whereby tourist visits remain concentrated either along the seafront or clustered together in the central city area. From the industry perspective, firms become more productive if they share information and transport costs with other service providers or even with competitors within the cluster. Firms can consolidate passengers in gateway cities; which allows reducing transportation costs (Dumais et al., 2002).

Theoretically, the location-specific factors that drive or shape the clustering of T&H employment are captured through five broad dimensions of geographic space, as shown in Figure 3.6. These dimensions include: tourism resources; urban demographic structure; accessibility to amenities; local economy; and demand variables. Using these dimensions, the location, size, and spatial clustering of T&H employment will be analysed and modelled at an aggregate level. Non-spatial factors such as inter-firm collaboration, trust, and firm rivalry are not incorporated in the analysis. Variables are incorporated to represent, where possible, key factors that Marshall identified in his theory of agglomeration including access to specialised labour, more diversified labour markets, saving on transport costs, shared infrastructure and access to market. However, the exact replica of those measures was not

possible with spatial indicators that represent objective parameters of regional economics and tourism resources. For instance, accessibility to transport network could be used in spatial modelling, though how efficiently the transport services are shared by firms cannot be incorporated. This research therefore makes no claims and the findings will be subjected to these constraints.

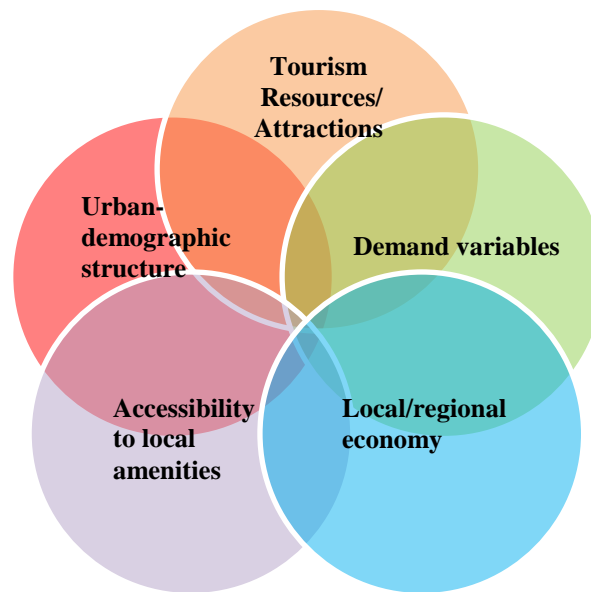


Figure 3.6: Location-specific dimensions of geographic space

The benefits of co-location of T&H firms and employment are enormous. A spatial theoretical perspective is now called upon to examine the clustered structure of T&H employment and to explore the possibility of building a more resilient economic base on which firms can anchor to gain the benefits of positive externalities of spatial T&H employment clusters. Identification of spatial factors that drive T&H employment clustering would improve the understanding of the location-specific reasons for firms to agglomerate. Establishing an empirical framework for exploring new tourism employment opportunities in areas of comparative advantage and converting them into competitive advantage will help grow tourism in regional areas.

3.5 Limitation of cluster theory

Despite the notable success of cluster theory globally, there are severe limitations of this theoretical approach to tourism planning. This section therefore discusses the key limitations of cluster theory. These limitations are categorised as theoretical, methodological and planning. These are discussed as following:

- The first is the *theoretical limitation* of cluster theory, which underpins the scope and scale of the cluster concept. As such there is no single theory of cluster (Feser, 1998) and the use of cluster theory as a development framework is rather chaotic (Martin & Sunley, 2003). The notion of cluster is often conflating and equating different types of processes and spatial scales of economic localization. Clusters, as argued by Glaven (2008), are often an outcome of ‘speculative actions’, which raises concern over the robustness of its theoretical validity. Ellison and Glaeser, (1999) also agreed with the difficulties of proper conceptualization of cluster, except that it is a non-random spatial concentration of economic activities. Multiple meanings of cluster therefore have created higher levels of complexity and confusion that, in turn, caused difficulties in formulating and implementing the cluster concept to a real world problem.
- Second is the *methodological limitation* of cluster theory, which underlines the accuracy, reliability, validity, and interoperability of cluster theory. Laperche et al., (2011), for example, highlighted various difficulties in defining ‘what a cluster really is and what its spatial /geographical boundaries could be’ (p. 22). Similarly, Held (1996) noted that: various governments in the rush have employed cluster theory as a tool, but often ‘some fundamental issues have been slighted, including appropriate research methods and even the definition of the cluster itself’ (p. 249). He further argued that ‘the notion of cluster remains rather fuzzy in its theoretical “contours”’

and its meaning is frequently confused with many other notions or concepts which are supposed to be neighbouring' (p. 249). However, the popularity of cluster theory is certainly not due to the clarity or precision of a well-rounded definition of cluster, but because of its simplicity as a concept. Nevertheless, any effort to develop a single more unified methodological framework that allows a systematic, structured and evidence based measurement of clusters will be highly valuable.

- Third is the *planning limitation* associated with applying cluster theory in tourism development and destination planning. It has been argued that cluster-based policies often encourage an over-specialization in a particular industry that, in turn, exposes a region to be more susceptible to economic turmoil or in adapting to rapid industrial transformation (Rosenfeld, 1997). Motoyama (2008) raised similar concern of excessive specialisation and overdependence on a particular industry to achieve scale economies that, in turn, reduces its capacity to adapt to structural changes (e.g. a shift from manufacturing to services economies). Breschi & Malerba's comment (2005) is noteworthy of attention, when he states that cluster theory has provided an 'intellectual foundation for largely failed policies that attempt to jump start growth in clusters by directive policy' (p. 117). There are numerous examples of cluster policy failures whereby government agencies planned and promoted 'high-tech' clusters without adequately considering the preconditions for their success or failure (Hefner, 1990). Such a blatant support for overambitious high-tech sector clusters has resulted in higher costs and produced no significant economic outcomes neither for regions nor local communities. However, cluster-led policy options to stimulate and sustain economic growth through strategic and planned government interventions might have failed in some cases, but proven to be successful in many cases.

3.6 SUMMARY

This chapter presented the genesis of cluster theory and described a range of different theoretical perspectives to examine the clustering of firms or employment in strategic areas. Cluster theory has provided a well-grounded theoretical basis for explaining the phenomenon of clustering of firms and employment. However, the debate on the development of a single theory of cluster is yet to be settled. Despite the diversity of opinions, concepts or ideas, cluster theory continues to mature and establish a strong theoretical trajectory to explain the key reasons for firms to cluster within a geographical area. The key purpose of this research is to develop a robust methodology, which will allow the identification, characterisation and measurement of key spatial T&H employment clusters. The key conclusions of this chapter include:

- Cluster theory, essentially, is a compilation of similar ideas, concepts and theories that collectively reflect the core logic of cluster – that is, the principle of co-location or agglomeration.
- The geographic delineation of tourism and hospitality clusters has been identified as a key methodological limitation. A spatial perspective is argued to apply spatial techniques to measure the spatial characteristics of T&H employment clusters.
- The localisation externalities, referred in this thesis as location-specific cost advantages/disadvantages, are used to examine the agglomerative behaviour of firms or employment. A spatial modelling approach is adopted to measure the impact of location-specific attributes on T&H employment clustering.
- Five key dimensions of geographic space are incorporated in spatial modelling. These dimensions include: Tourism resources; urban demographic structure; accessibility to amenities; local economy; and demand variables. Using these

dimensions, the location, size, and spatial patterns will be examined to reflect the spatial organisation of T&H employment clusters at an aggregate level.

The next chapter introduces the research methodology including the presentation of the case study area, the spatial approach and spatial econometric modelling for estimating the impact of location-specific attributes on T&H employment clusters.

CHAPTER 4

A SPATIAL METHODOLOGY FOR MODELLING TOURISM AND HOSPITALITY EMPLOYMENT CLUSTERS

4.1 INTRODUCTION

Chapter 4 develops a spatial methodology to analyse T&H employment clusters. Chapters 2 and 3 have established the theoretical framework for mapping T&H clusters. The concept of a cluster, however, was restricted to spatial representation and the factors that drive T&H employment clustering were confined to location-specific characteristics. In this chapter, a methodology to examine the tourism and hospitality employment cluster as a spatial construct is discussed and developed.

This Chapter begins with the detailed description of this study area to highlight the geographical, tourism and employment related characteristics. The methodological scope of this research is then defined, in terms of the spatial scale, scope and composition of T&H clusters. This is followed by a description of the datasets used to spatially represent the T&H employment and the location-specific attributes. A quantitative approach to data analysis is adopted, which requires explaining the methods and the modelling approach, along with a description of statistical assumptions and caveats. Finally, a methodological framework is developed to graphically illustrate the procedures, data inputs, and methods applied. This chapter specifically addresses the following three research questions:

- What are the different data variables that represent the tourism and hospitality clustering?
- What are the different spatial methods to quantify the clustering of tourism and hospitality employment?
- Why should spatial econometric models be applied to estimate the effects of location-specific attributes on tourism and hospitality employment?

4.2 STUDY AREA

Victoria, one of the States in Australia, has been selected as a study context to analyse T&H employment clusters. Victoria with its capital, Melbourne, comprises both urban and regional areas. This section establishes the geographic context of the State and discusses visitor characteristics and employment patterns. It also highlights the key T&H related issues in the state. The rationale for selecting Victoria as a case study has been discussed in Chapter 1.

4.2.1 Geographic Profile

Victoria is located in the south-eastern corner of Australia and is the smallest mainland state. It covers approximately 227,416 square kilometres. As shown in Figure 4.1, Victoria is bordered by New South Wales (NSW) to the north, South Australia (SA) to the west, and Tasmania (TAS) to the south, across Bass Strait. Victorian physiographical regions include desert plateaus in the west, the Victorian Alps in the North East, sandy beaches along the coast and eucalypt rainforest. Victoria has a mild temperate climate with warm to hot summers, moderate autumns and cool to cold winters and sunny spring. Victorian climate range extends from cold, hot, semi-dried, to moderate temperature. Due to the Alps in the north-east, the Great Dividing Range is the coldest region where winter temperatures can fall below 0 degrees Celsius. Victoria's coastal plains are generally mild and cool. The semi-arid North West regions are hottest where the average daily temperature in summer is above 30 degrees Celsius.

Melbourne is the capital of Victoria. Melbourne is known as the 'Garden City'. Seventy per cent of the population of Victoria live in Melbourne. It is regarded as Australia's sporting capital. It hosts many regular sporting events such as the Formula 1 Australian Grand Prix,

and the Australian Cup Tennis. In 2009, Melbourne was named as the world's 'Best Sports City' and in 2010 'Ultimate Sports City'. It has also being rated as the most liveable city in the world for the third time in a row. Victoria is known for the Australian Football League (AFL), commonly known as 'footy'. Victoria is also known for vineyards and wineries, which are located in regions such as Geelong, the Mornington Peninsula and the Yarra Valley.



Figure 4.1: The State of Victoria in Australia

Victoria is a multicultural state. It is culturally, linguistically and religiously diverse populated by people from 200 different countries, who speak more than 230 languages and follow more than 130 religious faiths (Victorian Multicultural Commission, 2011). In the 1850s Gold Rush era, many Chinese workers were brought in to work in mines. Early settlements of Greeks and Italians and now many Asians have made Victoria their home. Victoria's population is among the fastest-growing and most diverse in Australia (National Census, 2011)

Victoria's 2.9 million strong workforce represents about 25.2 per cent of total employment in Australia (11.5 million) (Australian Government, 2013). However, the employment in the state is highly concentrated in Melbourne, which accounts for almost three in every four workers. Employment growth in the Melbourne region has declined; whilst other regional areas such as Loddon-Mallee up by 7.8% or 10,300 employed and Central–Wimmera (4.8% or 4,800) registered a high employment growth in 2011 (ABS, 2011).

4.2.2 Tourism destinations and attractions in Victoria

In Victoria, there are 11 major tourism regions. These regions include: Daylesford and Macedon Range, Gippsland, Goldfields, Grampians, Great Ocean Road, Melbourne, Mornington Peninsula, The Murray, Philip Island, Victoria's High Country, and Yarra Valley & Dandenong Ranges. As shown in Figure 4.2, these tourism regions are further divided into 21 sub-regions. Each of these regions consists of a set of Statistical Local Areas (SLAs), which is the second smallest areal unit of the Australian Standard Geographical Classification (ASGC) (ABS, 2011). These tourism regions are generated to represent key tourism attractions. For example, the Goldfields represent the opportunity to experience historical sites or past events associated with the Gold Rush Era. Others are based on nature-based tourist attractions, such as the Grampians or Victoria's High Country. As the geographic boundaries of tourism regions are coterminous to statistical local areas, they thus provide a common analytical unit for comparing T&H employment data with visitor data.

The state of Victoria has a number of popular tourist attractions. In Melbourne, the top 10 urban inner city attractions include Queen Victoria Market, Federation Square, Crown Casino, Southbank, and Docklands. Among regional attractions, the popular tourist icons include: the Great Ocean Road, Ballarat/Sovereign Hill, Mornington Peninsula, Phillip Island and Bendigo.

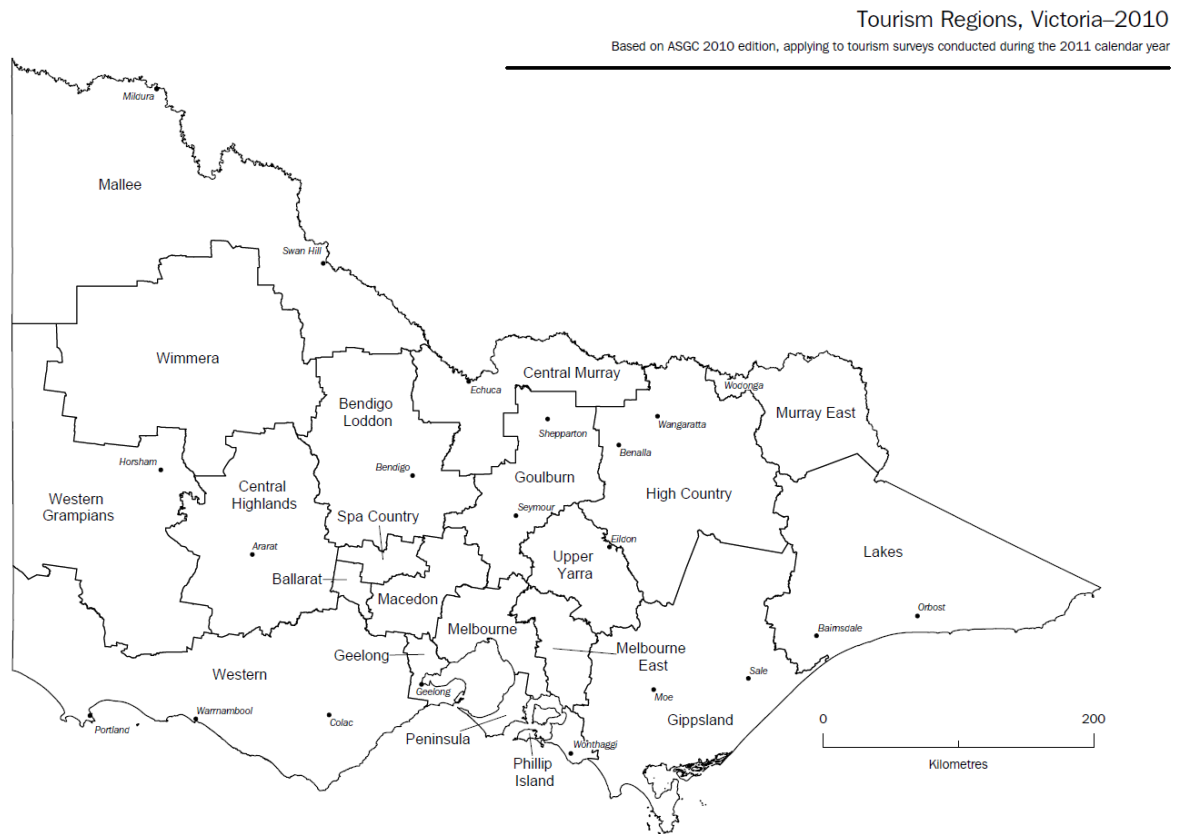


Figure 4.2: Tourism regions in Victoria (Australian Bureau of Statistics, 2011).

4.2.3 Visitor profile

Victoria is one of the most popular tourist destinations in Australia. It attracted 1.74 million international visitors (Tourism Victoria, 2011) and 9.0 billion domestic visitors per year (National Visitor Survey, 2011). The graph in Figure 4.3 shows the recent trends of visitor nights spent in Melbourne, in Victoria and in Regional Victoria. Since 2000, there is a steady rise in the number of visitor nights in Melbourne and Victoria in general. The growth pattern however has remained stagnant in regional Victoria since 2001. This could be partly explained by a rapid increase in the number of Asian tourists, who are less likely to visit or stay in regional Victoria in comparison to European tourists.

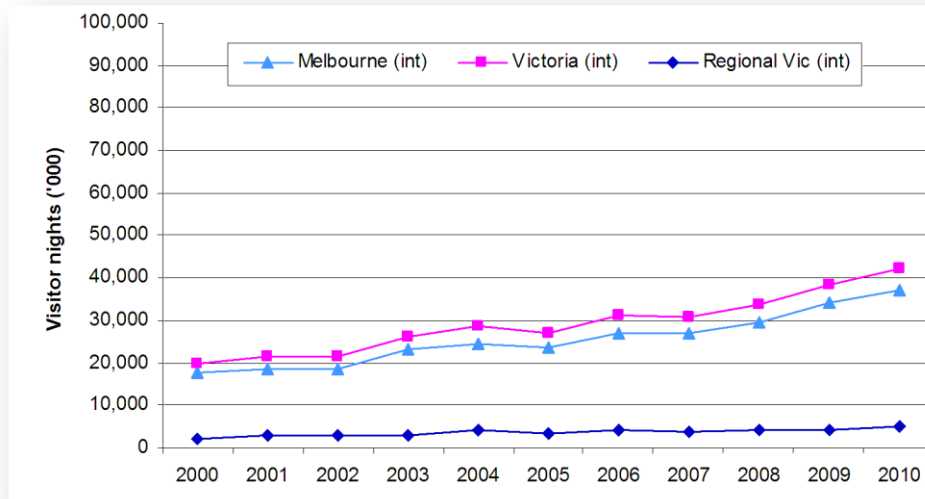


Figure 4.3: International visitors Trends in Victoria (Tourism Forecasting Committee 2010, pp. 3.11.)

Victoria attracts visitors from all over the world. The major sources (origins) of visitors include New Zealand, the UK, China, USA, Malaysia, Singapore and India. The Trans-Tasman Travel agreement, introduced in 1973, allows for the free movement of New Zealand and Australian citizens between the two countries, which explains the large proportion of tourists from New Zealand visiting family and friends in Australia. As shown in Table 4.1, China, India, USA and Malaysia are among the top four origins from where Victoria draws its tourists. Melbourne is the gateway city, which provides an entry or exit point to Victoria for the majority of international tourists. Most visits are in popular tourism destinations, including the Great Ocean Road, the Goldfields (i.e. Ballarat and Bendigo), the Grampians and the Alpine region in north east Victoria.

Country of Origin	Number of Visitors to Victoria	Number of Visitors to Melbourne
China	7446	7202
India	3905	3742
United Kingdom	3678	2775
Malaysia	2410	2192

Table 4.1: International Visitors Year ending September 2011 (source: Tourism Research Australia, International Visitors Survey, 2011)

The data in Figure 4.4 indicate that domestic tourism has become stagnant over the past decade in Victoria. In fact, there is a slight overall decline in visitor nights in Victoria as well as in regional areas. Melbourne, however, has managed to maintain a steady state with a little variation across different years. There is a slight upward movement in the number of visitor nights from 2009. This might be due to recent government promotions and strategies implemented between 2009 and 2012 to stimulate tourism growth in regional Victoria. Recent ABS data on domestic visitations in Victoria also shows a sign of recovery with an increase of 7 per cent registered in the year ending 2012 (Tourism Victoria, 2012). Interstate and intrastate had the strongest growth, rising 7 percent over the year 2009. Nonetheless, tourism forecasts suggest a decline in inbound travel, which will continue in the period to 2020 for Australia (Australian Government, 2011).

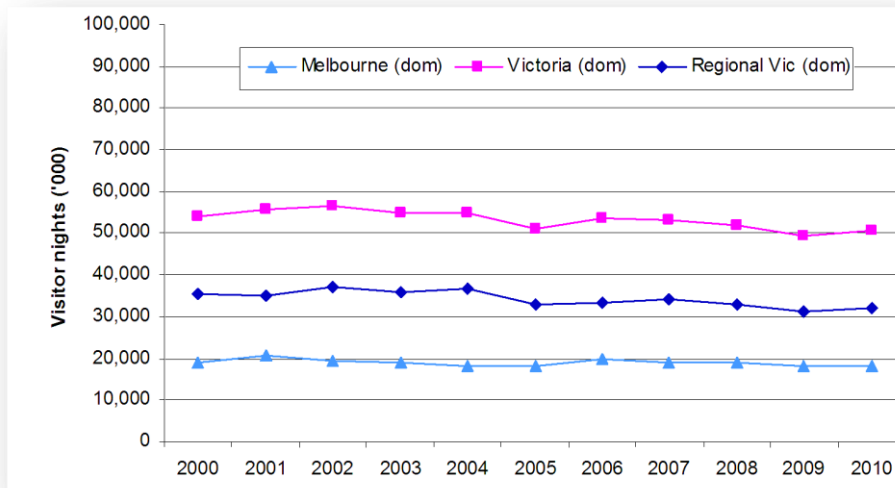


Figure 4.5: Domestic visitors Trends in Victoria (Tourism Forecasting Committee 2010a, pp. 3, 11)

Tourist movement in Victoria is increasingly becoming city-centric and Melbourne is attracting a large number of international visitors, particularly tourists from Asia. There is, however, a decline in the number of tourists visiting regional Victoria. This may suggest increased polarisation of tourists in bigger cities. With the rising difference in the visitor numbers between metropolitan and regional destinations, it is anticipated that there will be an increased demand for T&H services in high-volume urban destinations to fulfil the rising demand from Asian tourists. Regional tourist destinations will have to develop alternative strategies to attract new genres of Asian tourists as well as retain tourism workers during the off-peak seasons. A recent decline in the number of European tourists had a negative impact on regional tourism in Victoria (The Victorian Tourism Industry, 2010-11). Furthermore, a segment of European travellers also consists of low-budget independent backpackers, who tend to generate low-yield – lower level of spending. Some of these independent travellers also hold work permits, thus they often engage in temporary or seasonal employment in the T&H industry while simultaneously touring the regional and remote parts of Australia. The

Victorian Government (Tourism Victoria, 2013) has recently formulated a tourism plan, referred to as ‘regional dispersal’, which aims to support programs that help attract high-yield international tourists to regional Victoria. It promotes tourism products that encourage visitors to stay longer in regional areas. These also include a number of tourism programs, worth millions of dollars, to promote and market regional Victoria to domestic visitors, equally to international markets (Regional Tourism Action Plan, 2009-2012).

4.3 THE SCOPE OF THIS RESEARCH

This section outlines the scope of this research. It establishes the context, scale and nature of analysis within which the measurement and mapping of spatial T&H employment clusters will be carried out.

4.3.1 Amalgamation of tourism and hospitality industries

In this research, the term ‘tourism industry’ is used in a generic sense to include employment in both T&H industries. As concluded in Chapter 2, there is an urgent need to broaden the scope of the tourism sector to include hospitality industries to represent the tourism supply chains through which tourists are connected with services and products they require. The analysis of tourism and hospitality cluster makes more sense when these interrelated and interdependent industries are considered as integral parts of a seamless tourism services supply chain. In this research, the industries that are directly related to T&H will be identified and aggregated to collectively represent the tourism sector. The main focus of this research is therefore on those industries, which are directly related to T&H. As highlighted in Chapter 2, there is no doubt that a range of industries serve tourists; nonetheless they are not entirely dependent on income from tourism. People employed in these sectors, such as retail or transportation, spend only a small part of their job helping

tourists, and their job is not dependent on tourism. The inclusion of labour input into tourism industries from other sectors undoubtedly makes sense when estimating the contribution of tourism to the economy. The industries where T&H are 'not' the primary focus are therefore excluded. Nonetheless, the approach and methodology proposed here are adjustable to include any industry that can be deemed part of T&H industry.

4.3.2 Employment as a surrogate measure for T&H clusters

In this research, the size of employment, that is the number of people employed, is used as a surrogate measure for estimating the size of the T&H industry. Other alternative measures to represent the T&H clusters are the absolute number of individual businesses or the aggregate turn-over of the firms. In the absence of these geocoded datasets at the state level, the size of employment is used as a surrogate measure. The use of the number of businesses poses two main problems: first is the situation where a large organisation such as the Hilton Hotel employs hundreds of staff, but it represents as a single business entity in the database; second is the situation where a large number of smaller firms such as a series of restaurants employ a smaller number of workers. The use of such business database has the potential to generate spurious results, which could potentially over or under-estimate the size of tourism and hospitality clusters. Since the T&H industry is a labour-intensive industry, the use of employment data is relatively a better surrogate for representing tourism and hospitality employment. The assumption is that the higher the employment, the bigger the size of tourism and hospitality cluster.

Furthermore, the use of Census collected employment data provides regular, reliable and more accurate employment figures for the T&H industry. These data are based on actual population instead of estimates, often computed from a sample of large dataset such as a

survey. The use of Census employment data also enables the change in cluster development to be more accurately measured, mapped and monitored over various censuses. The integration of employment data with other census datasets is another key benefit.

4.3.3 Spatial measures of tourism and hospitality clusters

In Chapter 2, a tourism and hospitality employment cluster is presented as a spatial construct with an explicit geographical boundary. It is considered as a spatial agglomeration or clustering of T&H employment. So, a cluster is a homogeneous area, which is spatially delineated on the degree of employment concentration. In this thesis, then a T&H employment cluster is examined as two different concepts: a spatial employment concentration and a spatial employment clustering. Figure 4.5 provides a graphical representation of these two concepts. Spatial concentration shows the accumulation of T&H employment ‘*within*’ a spatial unit – the concentration within an area. Spatial concentration can be measured an absolute (i.e. the total number of T&H employees) or a relative value (i.e. percentage of T&H employment to total employment). It can also be measured through location quotient or the percentage of T&H employment to total employment.

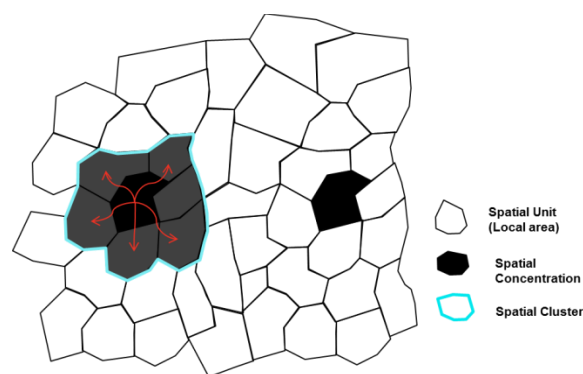


Figure 4.6: Difference between spatial concentration and spatial cluster

While, the spatial T&H employment cluster is defined as an area of high concentration of aggregate T&H employment surrounded by neighbouring areas of high T&H employment.

In other words, when an area and its adjacent areas hold higher levels of employment, they then collectively form a spatial cluster. Together, these spatial units with similar values (i.e. high T&H employment) are deemed a spatial cluster as long as each of these units has a high employment value, maintains spatially adjacency or contiguity (neighbourhood), and creates spatial dependency through generating spill-over effects.

4.3.4 The spatial scale of tourism and hospitality employment cluster

Clusters are often criticised for vagueness and inaccuracy, in terms of geographic demarcation. With an increasing number of reformulations proposed for mapping clusters in recent years, the cluster concept has proven to be difficult to assign precise and well-ordered analytical substance (Martin and Sunley, 2003). The scope and substance of clusters therefore vary significantly depending on the public authority or the decision-makers who develop and implement cluster policy to achieve a set of goals. As a result, researchers constructed clusters from the reach of innovation activity, to district, and sometimes even to regions without applying any rigorous methods or procedures to this problem. Virtualisation of cluster and outsourcing of production to multiple locations make the task difficult for tourism planners. There is therefore no widely agreed spatial unit that would provide a universally acceptable spatial framework for mapping clusters. As a result, T&H employment clusters range from a site-specific tourist attraction, or region, or even a large city. What is being defined as clustered at one spatial scale (e.g. within a city) may be a random pattern on another scale (e.g. between cities at a national level).

If the purpose of a cluster is to plan tourism at a regional scale (e.g. a wine region or a mining region), then it may be appropriate to consider a larger geographic unit. This would reflect the levels of regional variability, including spillover effects on neighbouring areas.

On the contrary, if the planning objective is to create micro-clusters at a land-use or parcel level, then clustering at a smaller spatial granularity would perhaps be more logical. For instance, clustering of car dealerships at a busy transit node on a highway, which attracts the attention of commuters or a strip of restaurants and hotels along a beach, necessitates planning at a micro-cluster level. Often, such clustering occurs within a census tract. For such scale, the point feature representing individual T&H firms could be used to measure spatial clustering. Point-pattern analysis, such as nearest neighbour analysis, can be applied to measure spatial clustering of T&H firms. However, the focus of this research is on strategic tourism planning rather than land-use scale operational planning. A regional approach is argued and thus adopted to analyse employment clusters with its potential contribution to spatially integrated tourism planning.

In this research, analysis and modelling are conducted at an aggregate level where the unit of analysis is a spatial object (i.e. an area). The analysis of T&H employment will be carried out at a Statistical Local Area (SLA) level, which is deemed equivalent to a suburb. The term 'area' is often used to refer to a SLA in this thesis. SLA as a unit of analysis has been selected for a number of reasons. These include:

- *Firstly*, SLA is the second lowest level in the ABS defined classification of Census geography. Use of SLA thus allows comparing and correlating T&H employment statistics with other census data. In addition, geographic boundary of SLAs is coterminous with tourism regions, meaning each tourism region consists of a set of SLAs. Employment statistics can therefore be generated for tourism regions, which will be practically useful for tourism labour force or tourism destination planning.
- *Secondly*, SLAs are similar to suburbs in Victoria, within which a local labour market operates. The average size of SLAs is neither too large nor too small. It thus

represents the neighbourhood within which the workforce engages in economic activities. The spatial unit below SLAs is Census Collection District (CCD), which, at times, is too small to capture employment patterns. There are CCDs where there is zero or limited T&H employment. The scale above SLA is the Local Government Areas (LGA), which represents local governments in Victoria. The spatial scale of LGAs however is too large, particularly in regional Victoria. In most LGAs, intra-regional variability is as high as inter-regional variability. Arguably, the use of LGA could undermine intra-regional variability, which is important to identify local T&H employment clustering. It would also lose richness of the detailed data and result in spurious spatial clusters.

- *Thirdly*, the use of SLAs can be justified from a methodological perspective. The size of LGA is apparently too large, so the spill-over effects become less relevant; while the size of CCDs is too small to incorporate the inter-regional interactions and linkages. Furthermore, the number of SLAs in Victoria is large enough to satisfy the basic assumption of sample size, which is required to conduct any multivariate analysis. The number of LGAs is rather too small, which violates the statistical assumption of having a minimum number of records per variable.

4.4 DATA SETS

There are three major sources of dataset used in the analysis. These include: Census-based Journey to Work (JTW) data, digital spatial data and the derived data. The description of each of these sources is given below.

4.4.1 Australian Bureau of Statistics (ABS) employment data

The Australian Bureau of Statistics (ABS) data on employment by industry, referred to as the Australian and New Zealand Standard Industrial Classification, has been used for the

identification and mapping of T&H clusters. Employer addresses were recorded in the census and these refer to the main job held in the previous week of employment, i.e. the week before census night. It also contains the data on the type of industry and the place of usual residence for each individual in Australia.

As illustrated in Figure 4.5, the ANZSIC scheme is hierarchically structured at four levels, i.e. Divisions (1-digit), Subdivision (2-digit), Group (3-digit) and Class (4-digit) (See Figure 5.3). The hierarchical level 'Class' is the smallest industry classification, and it provides detailed dissection of broader Divisions to capture more specific and detailed employment categories. In this analysis, a 4-digit code (Class) at the Statistical Local Area (SLA) is used to ensure the highest level of detail is incorporated. Since the T&H industry is not recognised as a formal sector in the national accounting, it requires identifying Classes across other Divisions such as Passenger Car Rental and Hiring or Air and Space Transport. These 4-digit sub-industries are extracted and then aggregated to collectively represent the T&H industry.

The ANZSIC data at a 4-digit level comprise 717 industries. Thus, the analysis begins with the identification of industries that are directly associated with T&H. 17 'Classes', called sub-sectors, are identified and aggregated to form the tourism and hospitality industry. Industries that are marginally related to T&H are not considered in this research. For example, the people employed in a museum as an interpreter for tourists could not be differentiated through this dataset. The sub-industries associated with public transport, such as metro or mass transit systems that tourists use for travel, are also excluded with the exception of air transport. These sub-industries are aggregated to compute the total number of jobs in the T&H industry by Statistical Local Area level. Multivariate analyses will be

conducted to extract the key industry dimensions from the ANZSIC employment data, which contain the total number of people employed in the selected T&H sub-industries for each of the 200 SLAs in Victoria.

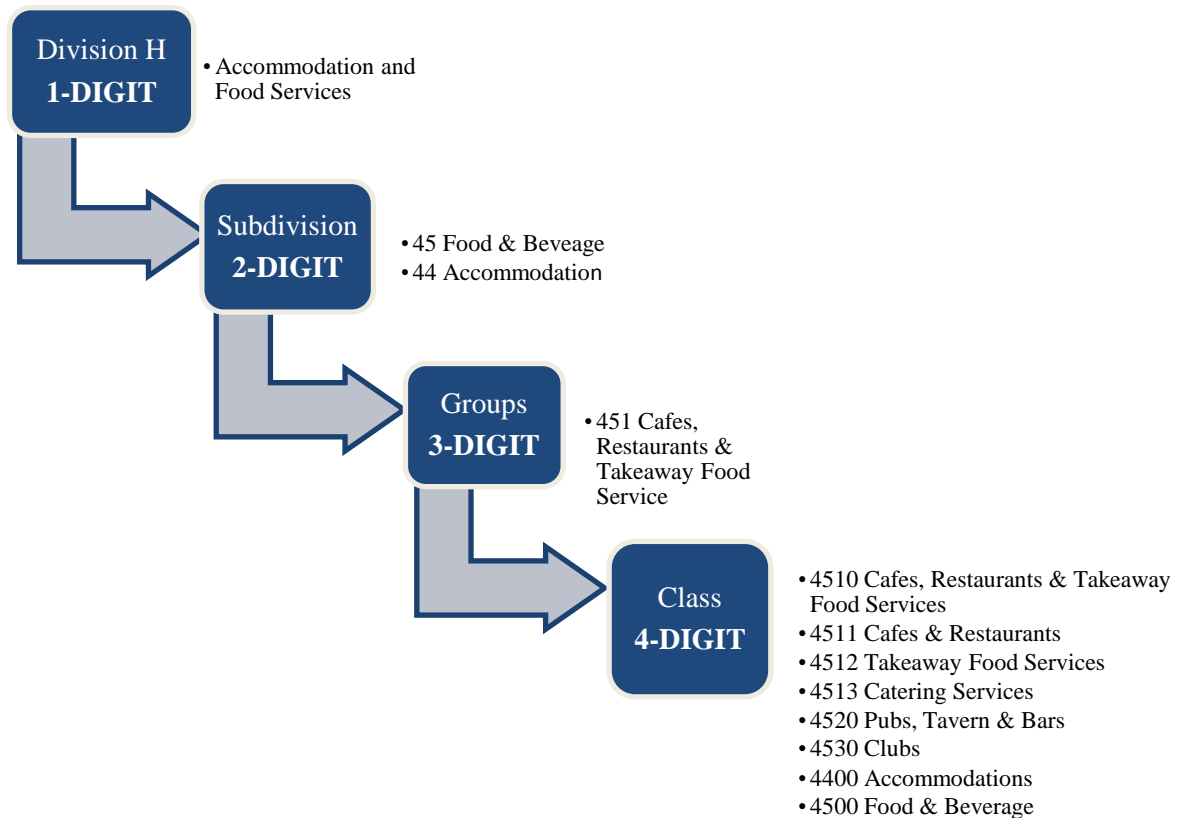


Figure 4.7: A hierarchical structure of industry: Australian-New Zealand Standard Industrial Classification (ANZSIC)

4.2.2 Spatial and derived datasets

Spatial digital datasets are acquired from a variety of sources. The majority of these basic datasets are extracted from the MapInfo ‘SteetPro database’. These include: road networks; railway networks and train stations; coastlines; lakes and rivers; shopping centres, and national and state parks; towns and metropolitan Melbourne; and tourism attractions. Various accessibility and attractiveness indices are derived from the base layers. These

include: tourism potential index, dwelling density, accessibility to the nearest train station, nearest airport and Melbourne CBD.

A point-based GIS layer, comprising all tourism and recreation-related attractions is created. A weighted shopping centre dataset is also derived, whereby larger shopping centres are assigned greater weights in comparison to smaller scale shopping centres. For example, Highpoint Shopping Centre, Altona Gate Shopping Centre and a local shopping centre in the west of Melbourne is allocated 50, 30 and 20 per cent weights respectively. A 'weighted retail potential index' is then computed as the total count of shopping centres weighted by their sizes divided by State average. Industrial and commercial zoning information was derived from the land use data whereas dwelling density was generated from the Census data. A number of indices such as an index of economic resources, household income, and median age are directly procured from the Census. The detailed descriptions and the derivation procedures of these datasets are provided in Chapter 6.

4.5 METHODS

In this research, a range of statistical methods are applied to quantify the clustering and modelling of T&H employment. Broadly, two sets of methods, (i.e. multivariate analysis and spatial statistics) were applied for modelling. In addition, geographic information system (GIS) is used to visualise the outputs generated from these analyses.

The flow diagram presented in Figure 4.7 illustrates the analytical framework to show inputs, outputs and the methods employed in analysing T&H employment. Using the ABS employment data, industries that are directly related to T&H are systematically selected and then aggregated to generate the total employment in the T&H industry. Using the data

reduction technique of principle component analysis (PCA), the selected tourism and hospitality sub-industries are compressed into a few more meaningful and interpretable underlying dimensions to capture the intra-groupings of sub-industries within the sector. These components are then mapped to show the spatial variability across these dimensions of the T&H industry.

Mapping is carried out using a range of methods to illustrate the spatial patterns of T&H employment. Location quotient index is computed for each area to quantify T&H employment concentration. Two measures of spatial autocorrelation – global and local indicators are used to compute a single global measure (Moran's I) and a local measure, called the Local Index of Spatial Autocorrelation (LISA) for each of the statistical local areas in Victoria. Using the Moran I plot, these local clusters are then mapped and their patterns are interpreted.

The final step in this analytical framework is to build spatial econometric models to estimate the effects of location-specific variables on T&H employment clustering. These are developed using spatial econometrics models, this generates estimates including the effect of spatial dependence. The model variables represent five spatial dimensions of geographic space, which are represented through a number of data variables.

Some of these methods and techniques are discussed below; the focus however will be placed on explaining the spatial autocorrelation and spatial econometric models.

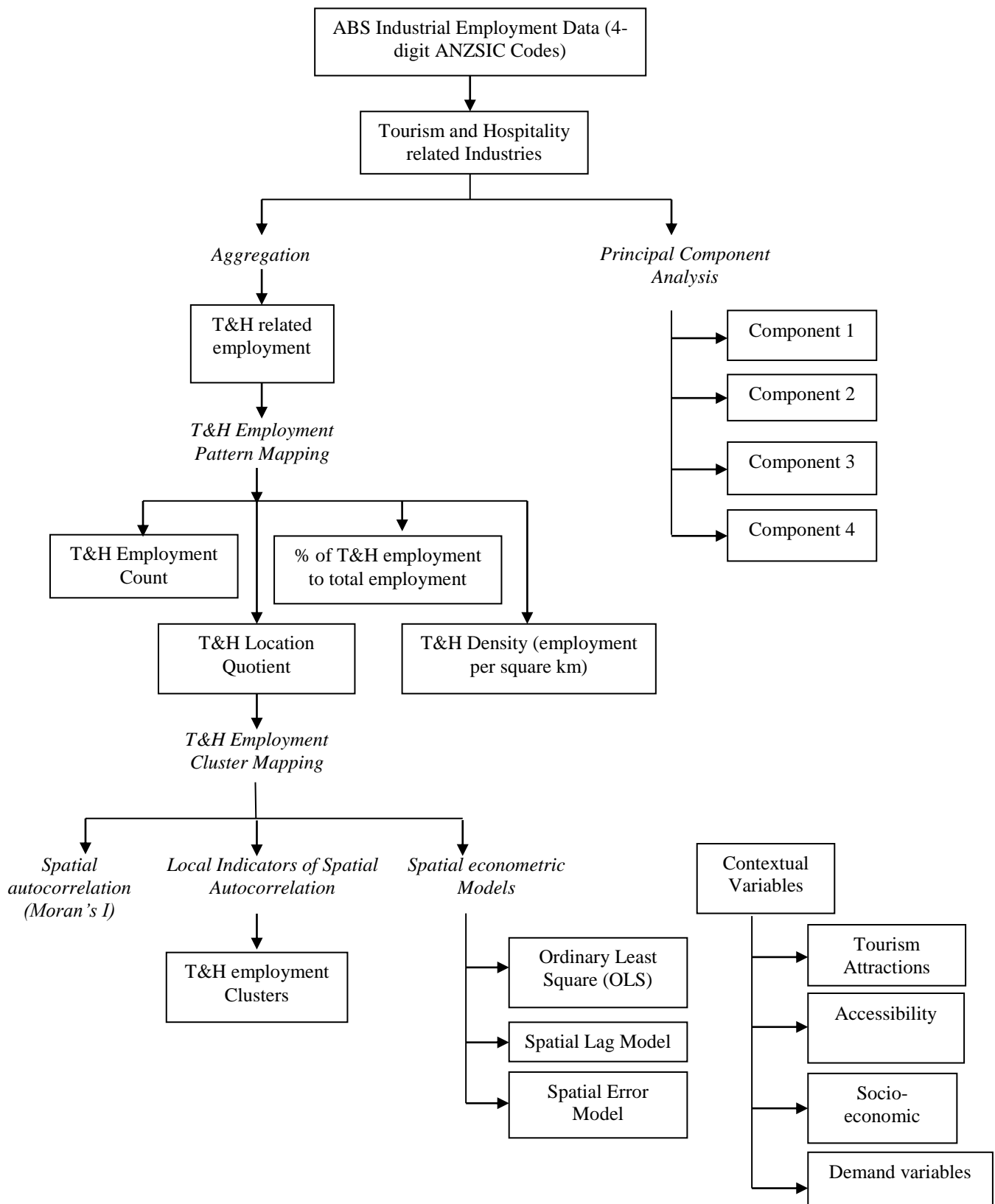


Figure 4.8: An analytic framework – inputs, outputs and processes

4.5.1 T&H employment cluster measurements

T&H clustering can be represented using a range of indicators. Clustering, for example, can be represented using the concentration of individual firms (i.e. count) or the size of businesses in terms of total turnover. The assumption is –the higher the number of firms or the volume of turnover within an area, the greater the concentration. It could also be measured through the scale of business transactions (i.e. represented as functional nodes) or the size of labour force employed in the industry.

T&H clusters are often measured through examining tourists' travelling patterns or clustering of tourists in space and over time to evaluate seasonality or overcrowding of tourist sites. There are other studies (Chhetri & Arrowsmith, 2008) that quantified the spatial concentration of tourists indicating the clustering of tourist activities. But at a firm level, there are few recent studies that visualised the spatial congregation of hotels along popular tourist areas, often to reflect intra-city variability of T&H services. Other techniques to investigate T&H clusters are to analyse tourism expenditure or tourism employment. None of these studies have attempted to incorporate inter-firm collaboration and coordination when these firms chose to co-locate within a given geographic space. However, recent study by Lade (2006) unfolded the role of human factors (e.g. strong local leadership, co-operation appropriate attitude) and non-human factors (e.g. presence of strong industrial structure) in the development of tourism business clusters in Victoria, Australia.

In this research, T&H employment clustering at a Statistical Local Area level is investigated using a range of measures. The employment count is an absolute measure, which computes the total number of people in the T&H industry for each SLA. However, there is no

reference to the size of the area or the size of the total employment. This could potentially generate spurious results as the size of SLAs varies substantially across the state. For example, there will be no difference between two SLAs, one with an area of 10 square kilometres and other with 100 square kilometres with an equal number of T&H workforce. To convert this absolute measure to a relative measure, T&H employment density is computed, which provides a reference base to compare two areas of different sizes. It is calculated as the number of jobs in T&H industries per square kilometre. Use of this relative measure enables highlighting the area where the actual count of employment or employment per square kilometre in the T&H sector is low, but its overall percentage to total employment is high.

In addition, two other measures are calculated: the percentage of T&H employment to total employment; and a measure of Location Quotient (LQ). LQ is a ratio of T&H employment to total employment in an area to the ratio of employment in T&H to total employment in Victoria. It is calculated for each SLA using the following equation.

$$\text{LQ} = \frac{\frac{\text{T\&H employment in a SLA}}{\text{Total employment in a SLA}}}{\frac{\text{T\&H employment in Victoria}}{\text{Total employment in Victoria}}}$$

For example, a LQ of 1.0 means that a SLA and the state of Victoria hold the same ratios between T&H employment to total employment; while an LQ of 1.8 means that the SLA has a higher concentration in T&H employment than in Victoria. Values greater than 1.0 show higher level of clustering; whilst values below 1.0 indicate lower level of clustering.

4.5.2 Lorenz Curve and Gini Coefficient

The degree of regional disparity in the distribution of a phenomenon such as wealth can be measured using the Lorenz Curve and the Gini Coefficient. To calculate the Lorenz curve, the T&H employment data are first ordered and then are proportionally cumulated by their size. In other words, the areas where a larger concentration of T&H employment exists are ranked in ascending order. Since the Lorenz Curve is a comparative measure, the size of total employment is used as a comparative benchmark (abscissa on the diagram in Figure 4.8) against which the concentration of T&H employment (ordinate on the diagram in Figure 4.8) will be compared. In terms of interpretation of the curve, if all statistical local areas are of the same value of employment (e.g. the number of people employed in the tourism sector), the curve will form a straight diagonal line – ‘the perfect equality line’, as shown in Figure 4.8. In the case of greater inequality of T&H employment, the curve will either be over or under the line of equality, which is referred as the Lorenz Curve.

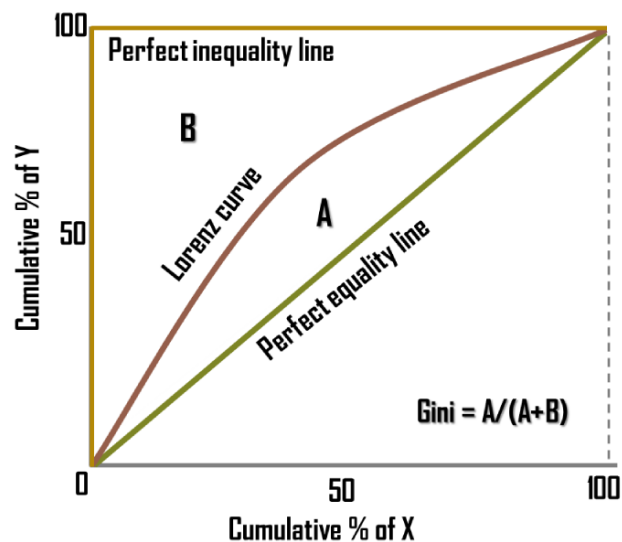


Figure 4.9: A graphical representation of Lorenz Curve

The degree of disparity (e.g. the extent to which the curve deviates from the line of equality) can be computed using the Gini Coefficient (G'), which is the ratio between the area

enclosed by the Lorenz curve and the line of equality (A), and the area under the line of equality within the given triangle (A+B). Since the data is arranged by the size of the observations in ascending order, the Gini Coefficient is computed as:

$$G = \frac{\sum_{i=1}^n (2i - n - 1)x'_i}{n^2 \mu}$$

Where, μ is the mean size, n is the number of observations.

The Gini coefficient ranges between 0 and 1, where 0 reflects complete equality (every area has an equal number of jobs); whilst 1 corresponds to a perfect inequality (a single location contained all jobs). The advantages of using Gini Coefficient are two-fold. First, it allows measurement of the degree of inequality by means of a ratio rather than a single descriptive measure; and second, it enables the differences across different sub-industries to be compared through a single measurement framework.

4.5.3 Principal component analysis

Principal components analysis (PCA) is a method of data reduction, which allows extracting a smaller set of linear combinations of the covariates that are uncorrelated with each other. PCA is a statistical procedure that applies an orthogonal (perpendicular) transformation to convert a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables called principal components (Hair et al., 2009). PCA has been a widely applied technique in economic, social and spatial data analysis. However, a brief introduction of the method is presented to establish the context within which statistical analysis will be carried out (See Figure 4.7). More detailed treatment on PCA can be found in Hair et al., (2009) and Tabachnick and Fidell (2012). In this section, an overview of PCA is presented in the context of this research.

In this thesis, PCA is used to reduce 18 sub-industries of T&H to a few principal components, which explain the maximum amount of variance in the sub-industries. PCA begins with finding the mean value of all data and sets it as the coordinate origin. The direction (best straight line) along which the data set has the largest variance is then detected and represented by 'component 1'. It proceeds with finding another direction that is orthogonal to component 1 and along with the data that has the largest possible variance. This direction is called Component 2. By repeating the process, a set of k principal components are extracted until no more components can be found (Hair et al., 2009). So the first component is a linear combination of variables that maximizes component score variance for the cases; the second extracts the maximum variance from the residual matrix left over after extracting the first component (therefore orthogonal to the first), if all components are retained, all variance explained. Therefore, the first component explains the largest variance along its axes, and the 2nd largest variance along the axes of component 2, and so on. In other words, the higher the order a component has, the more important it is for PCA analysis (Tabachnick & Fidell, 2001).

PCA is subjected to certain assumptions including the sampling adequacy. This can be tested with the Kaiser-Meyer-Olkin Measure of Sampling Adequacy, which varies between 0 and 1, with values closer to 1 being better. A value of 0.6 is a suggested minimum. As a rule of thumb, a bare minimum of 10 observations per variable is necessary to avoid computational difficulties (Tabachnick & Fidell, 2001)

PCA generates a number of outputs. For the covariance or correlation matrix, the eigenvectors correspond to principal components and the eigenvalues to the variance explained by the principal components. Eigenvalues describe how variables 'contribute' to

each component axis. PCA also produces component loadings, scores and component coefficients. Component loadings represent how much a component explains a variable in PCA. Loadings can range from -1 to 1. Loadings close to -1 or 1 indicate that the factor strongly affects the variable; whilst values close to zero indicate a weak effect (Arrowsmith & Inbakaran, 2002). A matrix of factor coefficients is another important output of PCA which identifies the relative weight of each variable in the component. The larger the absolute value of the coefficient, the more important the corresponding variable is in calculating the component. Component scores are used in this research for mapping each of the components generated through PCA. Chapter 5 will present the outputs of PCA and discuss the findings in the light of these statistics.

4.6 SPATIAL APPROACH TO ANALYSING TOURISM AND HOSPITALITY EMPLOYMENT CLUSTERS

A spatial approach to analysing aggregate employment data is adopted to enable identification of key employment concentrations. Autocorrelation is therefore a fact of life that exists in the natural or human world in various forms and over a wide range of spatial and temporal scales. Legendre (1993, p. 1659) states that spatial autocorrelation is ‘the property of random variables taking values, at pairs of locations a certain distance apart, that are more similar (positive autocorrelation) or less similar (negative autocorrelation) than expected for randomly associated pairs of observations’. Spatial autocorrelation means that adjacent observations of the same phenomenon are correlated. Spatial autocorrelation occurs when values of a variable are not independent from each other (Tobler, 1970).

In this section, the key methods employed in the statistical analyses are elaborated with a major emphasis placed on explaining the three-step processes.

4.6.1 Establishing space relations between spatial units

Space relationships between spatial units within a geographic network can be established in a number of ways. One method for establishing spatial relationships is binary contiguity between spatial units (See Figure 4.9). In the binary weight matrix, spatial connectivity is expressed as either a 1 or 0. That is, if two spatial units have a common border of non-zero length then they are considered to be ‘neighbours’ and assigned a value of 1, otherwise 0 is assigned (not neighbours).

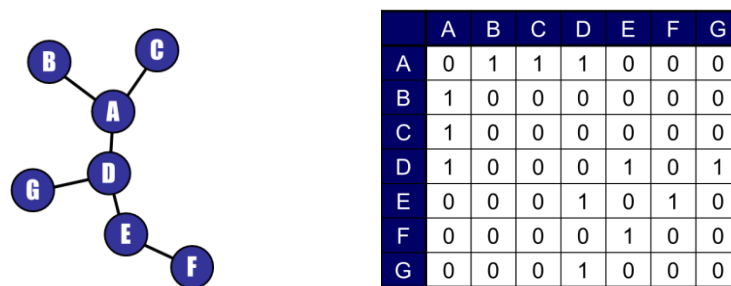


Figure 4.10: A binary matrix establishing spatial relations between nodes

The other method employs a distance-based approach to generate a matrix, which shows a distance between each pair of locations within a network, as shown in Figure 4.10. Here the distance between a pair of locations is populated in the cell on the matrix. For instance, the distance between a pair of locations is populated in the cell on the matrix. For instance, the distance between A and B is 8 kilometres, which is inserted in the cell representing the pair A and B. This process is then repeated for all cells.

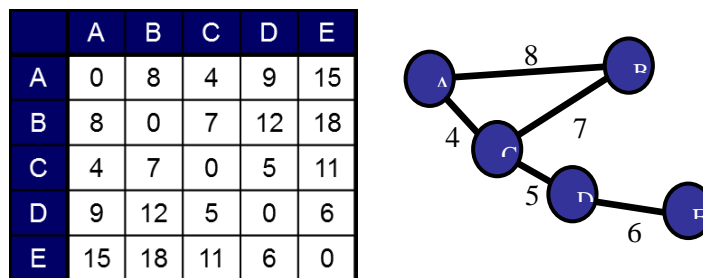


Figure 4.11: A distance matrix establishing spatial relations between nodes

4.6.2 Spatial autocorrelation measures

Spatial autocorrelation simply measures correlation of a variable with itself through space to identify any systematic patterns in the spatial distribution. Positive spatial autocorrelation exists when high or low values of a variable cluster in space; whilst negative spatial autocorrelation occurs when locations are surrounded by neighbours with very dissimilar values of the same variable, as illustrated in Figure 4.11. It has been argued that spatial heterogeneity can be handled by conventional non-spatial models such as random coefficients or error components models; however spatial dependence requires a non-conventional approach, such as spatial econometric approaches (Anselin, 1995).

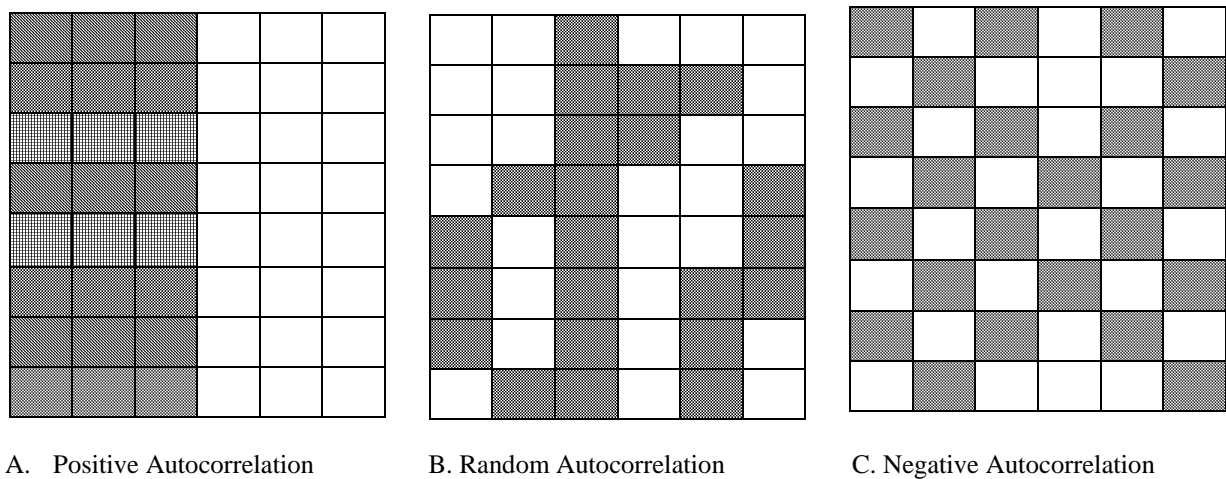


Figure 4.12: Spatial Autocorrelations

Getis-Ord General G measures concentrations of high or low values within a given geographic space. A high index value indicates that high values are clustered within the study area. A low index value indicates that low values tend to cluster. A Z score is also calculated to determine if the value is significant or not. Getis-Ord General index can be computed as:

The General G statistic of overall spatial association is given as:

$$G = \frac{\sum_{i=1}^n \sum_{j=1}^n w_{i,j} x_i x_j}{\sum_{i=1}^n \sum_{j=1}^n x_i x_j}, \quad \forall j \neq i$$

where x_i and x_j are attribute values for features i and j , and $w_{i,j}$ is the spatial weight between feature i and j . n is the number of features in the dataset and $\forall j \neq i$ indicates that features i and j cannot be the same feature.

Getis-Ord General G measure is useful when the clustering is very high or low (but not both). G is a good measure when the pattern shows random distribution yet when it contains areas of high value. Global statistics such as Moran's I and Geary's C answers question such as – is there a spatial pattern? (i.e. 'yes or no') Whereas General G identifies where high/low value is clustered. The most common use of General G is to detect statistically significant 'hot spots' and 'cold spots'. General G works with positive values only. The range of general G will always be 0 to 1.

In this research, the Moran's I is applied to measure the spatial autocorrelation of T&H employment. Moran's I is used for two reasons. Firstly, Moran's I is simple to interpret as compared to Geary's C . However, they both serve the same purpose. Secondly, Moran's I is compatible and is an essential input to spatial econometric techniques, which will be implemented in this research. The details on Moran I and other spatial econometric techniques are explained in the following paragraphs.

Spatial statistics are implemented as a three-step process to identify key T&H clusters and then the context-specific drivers. First is to compute a distance matrix, as explained earlier, to establish the spatial relationships between different areas within a given geographic space; second is to measure the spatial autocorrelation in the distribution of T&H employment using the Moran's I (Global) and Local Indicators of Spatial Autocorrelation

(LISA); and third is to model the effect of context-specific variables on employment clustering using spatial autoregressive techniques.

The first step is to generate a matrix to establish spatial relations between spatial units. A distance based approach is adopted to generate this matrix. This idea of a binary weight matrix is simply extended to a more general spatial weight matrix. A general spatial weight matrix uses a combination of distance measures to express the proximity between spatial units. For instance, one such method is to define W where the i, j th element is defined as follows:

$$w_{ij} = \begin{cases} \exp(-cd_{ij}), & \text{for } d_{ij} \leq D_{\max}, \\ 0, & \text{otherwise,} \end{cases}$$

where d_{ij} is the distance between unit i and unit j . D_{\max} is the maximum allowable distance between any i and j before spatial proximity becomes redundant, c is the decay parameter. A high value of c indicates that regional interactions are very proximate; whilst a lower value would suggest that interactions are more spread out over the state space.

The second step is to compute Moran's I , which is a weighted correlation used to detect departure from spatial randomness and to determine whether neighbouring areas are more similar than would be expected under the null hypothesis. The Moran's I statistics (Moran 1950) is the most common test to measure global spatial autocorrelation by combining each observation over all pairs of locations. This test statistics takes the form of equation () given below.

$$I = \frac{N}{(N-1)S^2W_{..}} \sum_{i=1}^N \sum_{j=1}^N w_{ij} (x_i - \bar{x})(x_j - \bar{x}), \quad (2)$$

where w_{ij} is an element of the spatial weight matrix W , x_i is observation

$i = 1, \dots, N$ and $S^2 = (N - 1)^{-1} \sum_{i=1}^N (x_i - \bar{x})^2$. Moran's I is positive when there exists a positive correlation between sites, negative for a negative correlation and zero when no spatial autocorrelation exists. The Moran's I index ranges from +1 to -1 with values close to +1 indicating spatial clustering and values near -1 indicating spatial dispersion (Lee & Wong, 2001). Inference from these statistics can proceed via permutation tests, such as the Monte-Carlo test. Furthermore, by using the asymptotic distribution of I , a normal test for the null hypothesis of no spatial autocorrelation can be performed on the standardized test statistics. It must be noted that Moran's I is quite sensitive to changes in the mean, and it can only be reasonably interpreted when there is a globally constant variance. Moran's I is inversely related to Geary's C , but it is not identical.

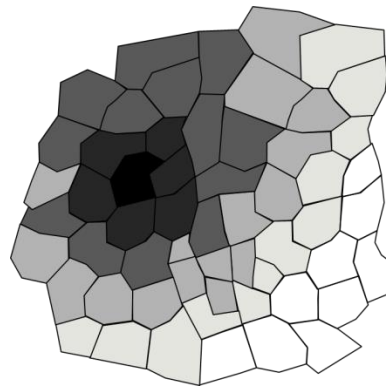


Figure 4.13: A typical global spatial autocorrelation pattern

4.6.3 Local Indicators of Spatial Autocorrelations (LISA)

The Moran's I is a global measure, whereby the spatial autocorrelation is computed across the whole dataset (i.e. entire geographic region). Therefore, it does not detect the local clustering of observations. Localized indicators of spatial autocorrelation (LISA) is one such useful diagnostic tool that decomposes the global measure into contributions for each area (Anselin, 1995). The LISA value generated for each observation indicates significant spatial clustering of similar values around that observation' (Anselin, 1995). The local Moran I

statistics enables spatial clustering of similar or dissimilar values of T&H employment to be mapped across the entire region. LISA statistics detect the regions where autocorrelation is unusually different. It identifies clusters of positive or negative autocorrelation. It also enables the capturing of abnormal observations in the data. The local Moran's I statistic is defined as:

$$I_i = \frac{N}{(N-1)S^2} (x_i - \bar{x}) \sum_{j=1}^N w_{ij} (x_j - \bar{x}). \quad (3)$$

Similar to the global statistics, a value close to 1 indicates positive spatial autocorrelation, a negative value suggests negative correlation and zero indicates that there is no autocorrelation.

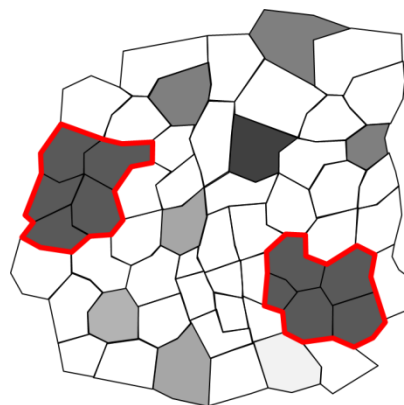


Figure 4.14: Local spatial autocorrelation patterns

Spatial autocorrelation also measures the coincidence of similar values with locational similarity in terms of spatial contiguity (Anselin & Bera, 1998). Figure 4.14 shows four different types of spatial cluster: i) high-high; ii) high-low, iii) low-high, and iv) low-low. Of these types of spatial autocorrelation, positive autocorrelation is by far the most intuitive. Negative spatial autocorrelation implies a checker-board pattern of values (see Figure 4.11) and it does not always have a meaningful substantive interpretation.

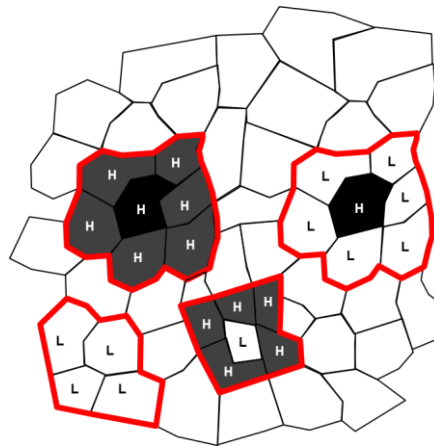


Figure 4.15: Typologies of spatial clusters

4.6.4 Spatial econometric models

Spatial econometrics is ‘a collection of techniques that deal with the peculiarities caused by space in the statistical analysis of regional science models’ (Anselin, 1988). The spatial econometric models are appropriate to spatial data where spatial dependence in observations often exists. It requires the specification and testing of models to include spill-over effects. Most statistical models function on the assumption that the values of observations in each sample are independent of one another. Exclusion of these spatial effects may produce bias or inefficient estimation of parameters. It measures the strength of spatial autocorrelation and tests the assumption of independence or randomness. In other words, spatial autocorrelation measures the extent to which the occurrence of an event in an area constrains, or makes it more probable for the occurrence of the same event in a neighbouring area.

The use of statistical methods such as ordinary least square (OLS) regressions is common to examine the spatial distribution of tourism activities, but only a few recent studies have incorporated spatial relationships into modelling such as Zhang & Zhang (2011) and Yang and Wong (2013). Many statistical methods such as OLS regressions and their inferences are inappropriate because of the assumption of non-spatial independence and non-random

selection of observations. In other words, the assumption that any event has an equal probability of occurring at any position in the region and the position of any event is independent of the position of any other. If observations such as crimes or unemployment rates are spatially clustered in some areas than others, then the estimates generated through the correlation or Ordinary Least Square estimator will be biased and overly precise. It is because the areas with higher concentration of events will have an impact on the model estimates and less independent observations than are being assumed. This could result in a downwardly biased estimate of error variables that, in turn, inflates the observed R^2 values.

The key advantage of spatial econometric techniques is the ability to incorporate spatial effects in estimations. These effects exist in the spatial data due to two main reasons: ‘spatial heterogeneity’ and ‘spatial dependence’. Spatial heterogeneity occurs due to the lack of uniformity among the features of spatial units (Anselin, 1988), or instance, when the tourism attractions are unevenly distributed over a geographic space. Spatial heterogeneity in a distribution creates structural instability in the forms of non-constant error variances, also called spatial heteroscedasticity, and non-constant coefficients that impact on the variable coefficients in the model estimations.

Spatial dependency, on the other hand, occurs when in a space the existence of functional relationship operates, meaning what happens at one location depends on what happens elsewhere (for example, neighbouring effect) (Tobler, 1970). Spatial dependence is often present in a spatial phenomenon. Spatial dependence can also be explained by the first law of geography – ‘Everything is related to everything else, but near things are more related than distant things’ (Tobler, 1970, p. 234). Spatial dependence becomes stronger when observations are clustered and weakens when observations are more dispersed (Cressie,

1993). Spatial dependence is often captured in spatial autocorrelation or spatial association among observations, which can be positively or negatively correlated.

Global statistics such as Moran's I are informative only when spatial heterogeneity is observed. Quite often this is not the case. If the overall level of spatial autocorrelation is the focus in the absence of a constant variance, then spatial autocorrelation can be captured in the error terms. In order to do this, it is required to account for the main effects of the system by fitting the model as given by equations (...) and (...) given below.

$$y = \beta X + \varepsilon \quad (4)$$

The idea is that if there is no spatial autocorrelation then it is expected to see the dependent variable explained completely by equation (5), where $\varepsilon \sim N(0, \sigma^2 I_N)$. If spatial dependence does exist, then the residual vector would show this dependence.

We define Moran's *i* statistical equation as follows:

$$i = \frac{e' W e}{e' e}, \quad (5)$$

Where e is the vector of regression residuals and W is the spatial weight matrix. This statistical equation may be interpreted in the same way as equation (3) was, that is, asymptotically distributed $N(0,1)$.

Assuming that spatial autocorrelation exists, it is then important to fit the spatial model. Two main types of model are commonly applied, the 'spatial error model and the 'spatial lag model'. The spatial error model attributes the unexplained error to be a result of spatial structure in the error terms. That is, unexplained error can be accounted for by clustering the error terms. In contrast, the spatial lag model stipulates that as well as being the main effects, the response is also a function of its neighbours. For instance, if unit i and unit j are neighbours, then the observation x_i will affect the observation x_j .

The spatial lag model estimates a coefficient similar to the one obtained for other independent variables. Spatial lag is the weighted average, which is computed from values of neighbouring areas adjacent to the target area. The formula theoretically suggests that dependent variable is actively influenced by neighbours and independent variable is easily modified to incorporate the spatial lag.

$$\begin{aligned} y &= \rho W_1 y + X\beta + \varepsilon, \\ \varepsilon &\sim N(0, \sigma^2 I_n). \end{aligned} \tag{6}$$

where y is an $n \times 1$ vector of dependent variables, X is an $n \times k$ vector of explanatory variables, W_1 and W_2 are $n \times n$ known weight matrices, β is a $k \times 1$ parameter vector associated with the variables X , ρ is the coefficient of the spatially lagged dependent variable, and λ is the coefficient in the spatial autoregressive structure for the error disturbance ε .

The spatial error model (SEM) includes a spatially correlated error structure by considering the distinct effect of the missing variable in spatial lag error terms and by observing heterogeneity in the observation units and sampling pattern.

The SEM model takes the form represented by equations.....

$$\begin{aligned} y &= X\beta + \mu, \\ \mu &= \lambda W_2 \mu + \varepsilon, \\ \varepsilon &\sim N(0, \sigma^2 I_n). \end{aligned} \tag{7}$$

Inference for these models proceeds in the usual way, by examining the goodness of fit of the models to the data. Overall, the use of spatial statistics will help overcome the limitations of the traditional (global) regression models in their ability to analyse aggregated spatial data. In this research, a spatial econometric modelling approach is adopted to generate more reliable results and also compare model performance with the OLS results. These are reported in the data analysis part of this research.

4.7 SUMMARY

This chapter developed a research methodology that adopts a spatial approach to the identification of T&H employment clusters. It described the datasets used in this research, elaborated the case study area, and explained the methods applicable to analysis of spatial employment data. The underlying dimensions of T&H employment across sub-industries are extracted through the use of principal component analysis. Spatial autocorrelation and spatial econometric methods are applied to identify the key spatial tourism and hospitality employment clusters and to estimate the effects of location-specific attributes on T&H employment respectively.

This chapter concludes with the following statements:

- The term ‘tourism industry’ is used in a generic sense to include employment in both T&H industries. The T&H sub-industries are therefore aggregated to ensure all key components of tourism services supply chain are incorporated.
- The size of employment, that is the number of people employed, is used as a surrogate measure for representing the size of the T&H industry. The assumption is that higher the employment, larger the size of the T&H cluster.
- A regional approach to analysing tourism and hospitality employment clusters is adopted. Thus, clusters are presented as a spatial construct to capture the aggregate agglomerative behaviour of firms or employees.
- The spatial autocorrelation measures, both global and local indicators, are explained to delineate geographic boundaries of T&H employment clusters. Two spatial concepts – a spatial concentration and spatial clusters, are described to represent T&H employment clusters in Victoria. An area of high concentration of aggregate

T&H employment surrounded by neighbouring areas of high T&H employment is defined as a T&H employment cluster.

- The effects of location-specific factors on T&H employment clustering are estimated using spatial econometric techniques.

The next chapter will undertake the principal component analysis on T&H employment data.

CHAPTER 5

ANALYSIS OF TOURISM AND HOSPITALITY

EMPLOYMENT

5.1 INTRODUCTION

This chapter examines the underlying dimensions of T&H employment and identifies the key spatial concentrations of T&H employment in Victoria, Australia. The chapter begins with the identification of key sub-industries, which are directly related to tourism and hospitality. The employment numbers in these sub-industries are then aggregated to represent the tourism and hospitality industry. Principal component analysis is used to extract the key dimensions representing the tourism and hospitality industry. Aggregate employment figures are then computed for each of the statistical local areas and tourism regions. Employment data are also analysed to examine the regional disparity using the Lorenz curve and Gini coefficients. Finally, the relationships between the T&H employment and the number of visitors are then explored.

Overall, the following research questions are the focus of examination:

- What sub-industries typically constitute the tourism and hospitality industry?
- What are the key underlying dimensions that characterise the tourism and hospitality industry?
- Is tourism and hospitality employment spatially concentrated?
- Is the supply of tourism and hospitality employment correlated to the total number of visitors?

5.2 IDENTIFICATION OF TOURISM AND HOSPITALITY SUB-INDUSTRIES

The first step of the analysis involves the identification of sub-industries that are directly related to T&H. Drawing on ANZSIC (Australian New Zealand Standard Industry Classification) data at the 4-digit industry level, as previously described in Chapter 4, there are a total of 717 industry sectors across the entire economy. Sub-industries (Class) which are directly related to T&H are identified. The sub-industries where T&H services are not the primary focus are excluded. For example, people who are employed in museums as

interpreters for visitors are excluded. Apart from air transport, public transport employment is also excluded. Table 5.1 provides the listing of the key sub-industries, the number of people employed, the percentage to the total T&H industry and the share of total T&H employment. For instance, there are 157,000 people employed in Cafes and Restaurants, which is 22 per cent of the total T&H industry, representing a 1.73 per cent share of total employment. Cafes and Restaurants (22%) are the largest employer, followed closely by Takeaway Food Services (20%), Accommodation (17%) and Pubs, Taverns and Bars (10%). They all individually comprised more than 10 percent of the workforce. In 2006, the total number of employees in the T&H industry in Australia was 705,064, which accounted for 7.74 per cent of total employment.

Table 5.2 provides state-wide T&H employment statistics. Of the total T&H employment, New South Wales is highest, followed by Victoria and Queensland. However, the percentage of T&H employment to total employment is highest in Northern Territory (NT) and the Australian Capital Territory (ACT). It shows higher dependency levels of the NT on and ACT on tourism. It could also be because of the Territories' lower share of other key industries such as Banking and Finance or Manufacturing. In the ACT, the high demand for T&H services could be due to a high influx of visitors, bureaucrats and politicians at particular times of the year.

Table 5.1: Employment in key sub-industries in the tourism and hospitality sector

Tourism and Hospitality Sub-industries	People employed in T&H	% of total T&H employment	% of total employment
Cafes and Restaurants	157,484	22.34	1.73
Takeaway Food Services	144,772	20.53	1.59
Accommodation	117,707	16.69	1.29
Pubs, Taverns and Bars	72,349	10.26	0.79
Clubs (Hospitality)	44,077	6.25	0.48
Air and Space Transport	38,433	5.45	0.42
Travel Agency and Tour Arrangement Services	29,925	4.24	0.33
Catering Services	24,864	3.53	0.27
Casino Operation	12,242	1.74	0.13
Food and Beverage Services, nfd*	11,906	1.69	0.13
Other Gambling Activities	7,704	1.09	0.08
Museum Operation	6,411	0.91	0.07
Airport Operations & other Air Transport Support Services	6,302	0.89	0.07
Nature Reserves and Conservation Parks Operation	6,143	0.87	0.07
Passenger Car Rental and Hiring	6,140	0.87	0.07
Scenic and Sightseeing Transport	4,526	0.64	0.05
Amusement Parks and Centres Operation	3,779	0.54	0.04
Amusement and Other Recreation Activities, nec	2,872	0.41	0.03
Zoological and Botanic Gardens Operation	2,571	0.36	0.03
Cafes, Restaurants and Takeaway Food Services, nfd	1,398	0.2	0.02
Sport and Recreation Activities, nfd	1,338	0.19	0.01
Sport and Physical Recreation Activities, nfd	1,082	0.15	0.01
Accommodation and Food Services, nfd	552	0.08	0.01
Parks and Gardens Operations, nfd	155	0.02	0
Amusement and Other Recreation Activities, nfd	145	0.02	0
Heritage Activities, nfd	131	0.02	0
Gambling Activities, nfd	56	0.01	0
Total employment in Tourism and Hospitality	705,064	100	7.74
Total employment in all industries	9,104,187		
Employment in T&H to total employment	705,064	7.74	

*nfd, not further defined * nec not elsewhere considered

Table 5.2: State-wide tourism and hospitality employment statistics

States	T&H employment	Total employment	Percentage of total T&H employment	Percentage of total employment
New South Wales	220976	2720918	8.12	2.58
Victoria	151275	2141279	7.06	1.77
Queensland	148006	1711507	8.65	1.73
South Australia	44378	652733	6.8	0.52
Western Australia	61799	880472	7.02	0.72
Tasmania	16534	192989	8.57	0.19
Northern Territory	8236	81462	10.11	0.1
Australian Capital Territory	13312	184087	7.23	0.16
Other Territories	140	1273	11.0	0
	664656	8566720	100	7.76

5.3 TOURISM AND HOSPITALITY EMPLOYMENT BY LOCAL AREAS

Table 5.3 lists the tourism and hospitality employment in the top ten SLAs in Victoria. When ranked on total number of tourism and hospitality employment, the top 10 SLAs are in Melbourne Metropolitan Area, with the exception of Ballarat - Central. As expected, Melbourne (C) – Inner has the highest number of employees in the tourism and hospitality industry, followed by Melbourne (C) - Southbank and Docklands, and Melbourne (C) Remainder. Hume (C) –Craigieburn has 7,480 employees, who are largely employed in the Tullamarine Airport Hub– an international and domestic airport-gateway to Melbourne.

The ranking however dramatically changes when SLAs are ordered on the percentage of tourism and hospitality employment to total employment (see Table 5.3). The top 10 SLAs now represent regional Victoria. Except for Hume (C) – Craigieburn, these SLAs are popular resorts or coastal destinations for tourists. The proportion of tourism and hospitality employment is as high as 74 percent, as in the case of Mount Hotham Alpine Resort. A higher ranking shows greater dependency on the tourism and hospitality industry. The location quotient (LQ) also shows similar ranking of SLAs. The size of tourism and

hospitality employment in Mount Hotham, Mount Baw Baw and Mount Stirling Alpine Resort is nine times larger than the average tourism and hospitality employment in Victoria. The employment density measure, which is the total tourism and hospitality employment per square kilometre', shows a different order of ranking of SLAs when compared with the results of LQ measure. The top 10 SLAs on employment density are located in Melbourne and Geelong– the two largest metropolitan cities in Victoria. Melbourne – Inner employs 6,337 people per square kilometre in the tourism and hospitality industry, whereas the employment density in Geelong is 135 people per square kilometre.

Table 5.3: Top 10 Statistical Local Areas in Victoria

Top 10 SLA by total T&H Employment		Top 10 SLA by Location Quotient (LQ)		Top 10 SLA by the percentage of T&H employment to total employment		Top 10 SLA by T&H employment density per square kilometre	
Melbourne (C) – Inner	12167	Mount Hotham Alpine Resort	9.56	Mount Hotham Alpine Resort	74%	Melbourne (C) - Inner	6337
Melbourne (C) - S'bank-D'lands	7691	Mount Baw Baw Alpine Resort	9.31	Mount Baw Baw Alpine Resort	72%	Melbourne (C) - S'bank-D'lands	1629
Melbourne (C) – Remainder	7565	Mount Stirling Alpine Resort	9.04	Mount Stirling Alpine Resort	70%	Port Phillip (C) - West	318
Hume (C) - Craigieburn	7480	Lake Mountain Alpine Resort	8.91	Lake Mountain Alpine Resort	69%	Port Phillip (C) - St Kilda	304
Port Phillip (C) - West	3773	Falls Creek Alpine Resort	5.72	Falls Creek Alpine Resort	44%	Yarra (C) - Richmond	292
Stonnington (C) - Prahran	2729	Mount Buller Alpine Resort	5.29	Mount Buller Alpine Resort	41%	Stonnington (C) - Prahran	285
Kingston (C) - North	2719	Hume (C) - Craigieburn	4.29	Hume (C) - Craigieburn	33%	Melbourne (C) - Remainder	256
Port Phillip (C) - St Kilda	2661	Colac-Otway (S) - South	3.48	Colac-Otway (S) - South	27%	Yarra (C) - North	180
Yarra (C) - North	2393	Bass Coast (S) - Phillip Is.	3.31	Bass Coast (S) - Phillip Is.	26%	Boroondara (C) - Hawthorn	154
Ballarat (C) – Central	2095	Alpine (S) - East	3.15	Alpine (S) - East	24%	Geelong	135

5.4 KEY COMPONENTS OF THE TOURISM AND HOSPITALITY INDUSTRY

The tourism and hospitality industry is not a single homogenous industry group. It is rather a grouping of inter-related and interdependent sub-industries, which directly or indirectly offer tourism and hospitality services. The sub-industries within the T&H industry may serve different interrelated functions. For example, the aviation industry such as airlines

performs a transportation function whilst the casino industry offers entertainment service to visitors. However, the key function of a tour operator, that is transportation service related to a tour, is fairly similar to the one performed by the aviation industry. They are also interdependent on each other. For instance, visitors often travel by air to a destination and then are transported to hotels and subsequently local touring of attractions. All of these involve provisioning of transportation services at various levels. In this section, the sub-industries are examined to identify key groupings within the T&H industry.

Principal Component Analysis (PCA), as explained in Chapter 4, has been employed to identify the groupings of sub-industries within the T&H industry. PCA is considered appropriate because of its explorative capability in extracting components that explain underlying relationships between input variables representing different sub-industries. PCA extracts the key underlying components from a set of interrelated sub-industries. A reduced number of new variables, known as components, are obtained from highly correlated sub-industries. This technique extracts hidden (latent) relationships by eliminating redundancies from a set of interrelated sub-industries. These components are descriptively, not normatively labelled to represent the role and functions that they perform within the sector.

The employment data was pre-processed and cleaned before the analysis. Industries where the total number of jobs is less than 200 were excluded. Multicollinearity was evaluated through correlation analysis, which measures the strength and direction of linear relationship between two variables. More than 70% of the correlations were found to be significant at the 0.05 level (the 95% confidence level). No Multicollinearity issue was identified. This means that PCA is an appropriate technique for this analysis.

A principal components analysis with varimax rotation is used to extract the appropriate number of factors. Varimax rotation, which was introduced by Keiser (1958), is a popular rotation method by far (Abdi 2003). The reason for selecting varimax rotation is that the technique generates a simple solution based on orthogonal structure – means that each component has a small number of large loadings and a large number of zero (or small) loadings. This simplifies the interpretation because after a varimax rotation, each original variable tends to be associated with one of the factors and each factor represents only a small number of variables. This method was selected as the constructs to be measured were hypothesised to be independent and the law of parsimony dictates that simple solutions are preferred. The PCA was repeated after each addition or deletion of items, resulting in further amendments. This continued until all remaining sub-industries are loaded significantly on one component and weakly on the other.

Varimax rotation identified a solution in which high component loadings were maximised. The selected model generated by PCA with varimax rotation identified four components with eigenvalues greater than 1 (refer to Table 5.4). The first component explains the largest variance along its axes (i.e. eigenvalue of 8.32), and the 2nd largest variance along the axes of component 2 (eigenvalue of 2.46), and so on. The higher order a component has, the more important it is (Tabachnick & Fidell, 2007). These four principal components explain the maximum amount of variance with the fewest number of principal components. These components were also tested for internal consistency reliability using Cronbach's alpha. A common cut off threshold of 0.70 is used, meaning alpha values higher than this threshold represent higher reliability of the construct. The Kaiser-Meyer-Olkin (KMO) was calculated and its value 0.811 clearly exceeds the 0.5 levels that indicate acceptability of the use of PCA. KMO measures the sampling adequacy to indicate whether there are sufficient

observations used in the analysis. This index varies between 0 and 1, and values closer to 1 are better (Tabachnick & Fidell, 2007). Bartlett's Test of Sphericity is also carried out. This tests the null hypothesis that the correlation matrix is an identity matrix. An identity matrix is matrix in which all of the diagonal elements are 1 and all off diagonal elements are 0. This null hypothesis is rejected (sig. 0.001).

Table 5.4 shows the component loadings which indicate how much a component explains a variable. Component loadings against the sub-industries are also depicted in Figure 5.1, which highlights the correlations between the variable and the component. Loadings can range from -1 to 1. Loadings close to -1 or 1 indicate that the component strongly affects the variable. Loadings close to zero indicate that the factor has a weak effect on the variable (Hair *et al.*, 2009). Where loadings on a component were greater than 0.4, these variables were retained.

Table 5.4: Rotated component Matrix

Tourism and Hospitality industries	Tourism Operational Services	Hospitality Services	Entertainment Services	Infrastructure Operational Facilities Services	Eigen-value	Cronbach's Alpha
1) Tourism Operational Services					8.32	0.86
8922 Nature Reserves and Conservation Parks Operation	0.87	0.168	-0.079	-0.022		
4400 Accommodation	0.844	0.313	0.305	0.062		
7220 Travel Agency and Tour Arrangement Services	0.844	0.388	0.069	0.121		
5010 Scenic and Sightseeing Transport	0.688	0.09	0.311	0.053		
9131 Amusement Parks and Centres Operation	0.439	0.329	0.157	-0.051		
2) Hospitality Services					2.46	0.82
4512 Takeaway Food Services	0.205	0.834	0.024	0.122		
4530 Clubs (Hospitality)	0.417	0.726	-0.081	0.016		
4510 Cafes, Restaurants and Takeaway Food Services, nfd	0.22	0.673	0.149	-0.014		
4520 Pubs, Taverns and Bars	0.212	0.633	0.198	0.012		
4511 Cafes and Restaurants	0.368	0.586	0.292	0.035		
4500 Food and Beverage Services, nfd	0.356	0.568	0.379	0.068		
3) Entertainment Services					1.81	0.76
8910 Museum Operation	0.212	0.195	0.87	0.007		
9201 Casino Operation	0.049	-0.113	0.797	-0.041		
4513 Catering Services	0.188	0.339	0.729	0.378		
9209 Other Gambling Activities	0.336	-0.002	0.751	0.036		
4) Infrastructure Operational Facilities Services					1.4	0.72
5220 Airport Operations and other Air Transport Support Services	-0.023	0.016	0.017	0.989		
4900 Air and Space Transport	0.097	0.058	0.034	0.981		
6611 Passenger Car Rental and Hiring	0.112	0.042	0.171	0.692		

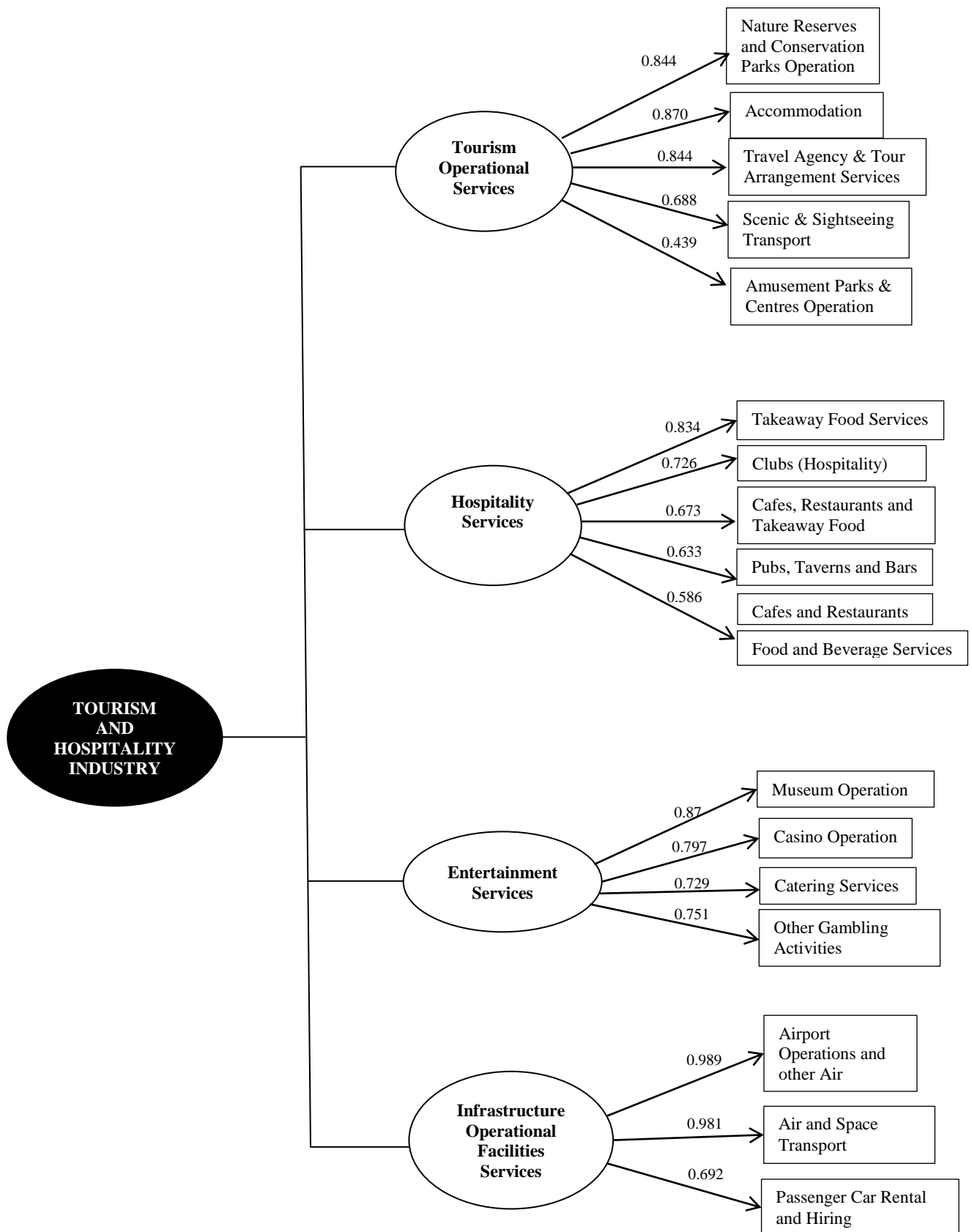


Figure 5.1: A schematic representation of the tourism and hospitality industry (values are factor loadings)

As shown in Table 5.4, the sub-industries that load heavily (that is highly correlated) on Component 1 are: Nature Reserves and Conservation Parks Operations, Accommodation, Travel Agency and Tour Arrangement Services, Scenic and Sightseeing Transport, and Amusement Parks and Centre Operation. These sub-industries are highly correlated, which could indicate their functional interdependency. In other words, they are inter-linked and interdependent services. This has been labelled the *'Tourism Operational Services'* component. It accounts for 44 per cent of total variance in the employment data. These sub-industries are also largely destination-based rather than origin-based services. This component therefore provides destination-based services to tourists to fulfil their local accommodation, transportation and recreational needs. These sub-industries are parts of larger value chains, which are functionally inter-linked and interdependent. For example, a failure to provide accommodation to tourists will have cascading effects on other services such as scenic and sightseeing transport or visit to amusement parks.

Component 2 is defined by: Takeaway Food Services, Clubs (hospitality), Cafes, Restaurants and Takeaway Food Services, not further defined, Pubs, Taverns and Bars, Food and Beverage Services, not further defined. This component is named the *'Hospitality Services'* component. It explains about 13 per cent of total variance in the employment data. This component highlights the retail aspect of the tourism and hospitality industry, which is related to food supply. The emergence of component 2 is interesting for three reasons. Firstly, it shows that the hospitality sub-sector has its own set of sub-industries and is relatively less related (or dependent) to tourism operational services. Secondly, it highlights the broader scope of the hospitality sub-sector to include services, which are offered to non-visitors or residents. Thirdly, the sub-industries within this component are not explicitly parts of the value chains, meaning a service disruption in Takeaway Food would have minimum impact on the visit to Pubs, Taverns and Bars.

Component 3 is heavily loaded on three sub-industries – Museum Operation, Casino Operation, Other Gambling Activities and Catering Services and explains nine per cent of the variance. This component is named the '*Entertainment Services*' component. These sub-industries are largely restricted to larger urban localities, which require achieving the economy of scale. These services are thus not destination based. They are rather offered in larger cities. These are often second-order auxiliary services, which supplement to the key tourism pursuits.

Four sub-industries defining the Component 4 are Airport Operations and Other Air Transport Support Services, Air and Space Transport and Passenger Car Rental and Hiring. Total variance explained by this component is approximately seven per cent. This component is named the '*Infrastructure Operational Facilities Services*' component, which are directly related to aviation. These components broadly characterise the air and road transportation services, which highlights the vitality of logistics infrastructure and transport services to get access to key tourist destinations. These sub-industries are providing supporting services to tourists to support movement of tourists between origins to destinations via key high throughput gateways and transit hubs.

5.5 Mapping tourism and hospitality employment

In this section, the aggregated tourism and hospitality employment and the underlying components, as identified in previous section, are mapped at a Statistical Local Area level using GIS. The employment figures in sub-industries, as listed in Table 5.1, are aggregated to generate a single column, which shows the total employment in the tourism and hospitality industry. In section 5.4, principal component analysis has identified four highly correlated components, which represent the key components of the T&H sub-industries. The

highly correlated structure within each component may reveal interdependency among sub-industries, but whether these sub-industries happen to cluster in particular locations of strategic advantage is yet to be explored. In this section, the spatial patterns in the distribution of T&H employment and its associated components are identified.

Figure 5.2 depicts the mapped results of T&H employment as a proportion of total employment in Victoria. Generally, the share of T&H employment to total employment is relatively lower in Melbourne metropolitan area, although the total number is relatively high. T&H employment is heavily concentrated along the coastal areas. Popular mass tourism destinations such as the Great Ocean Road in the south-west, Phillip Island south-east of Melbourne and areas around the Alpine region to the north-east are among those where the proportion of T&H employment relative to total employment is high.

Four components of T&H employment are also mapped. Component scores are used as input variables for each of the components to map the spatial employment patterns. “The use of regression technique within PCA allowed factor scores to be generated for each of the components as separate variables. The factor scores are computed using the component score coefficients matrix, which is an array of coefficients, similar to ‘regression weights’. As a result, a component score is computed for each of the statistical local areas across Victoria which is then mapped in GIS (see for more detail Arrowsmith and Inbakaran, 2002; Tabachnick and Fidell, 2001; and Chhetri and Arrowsmith

, 2002). In addition to generating component scores, T&H employment is also aggregated for each component to produce regional level statistics. Maps in Figure 5.3 show employment in tourism operational services, hospitality services, entertainment services and

infrastructure operational facility services. The key findings summarising the spatial patterns include:

- i) 'Tourism operational services' employment is spatial, dispersed across the State;
- ii) 'Hospitality services' employment is spatially concentrated in Melbourne Metropolitan Area and regional cities/towns including Ballarat and Bendigo;
- iii) Central Melbourne is identified as an employment hub for 'entertainment services';
and
- iv) 'Infrastructure operational facility services' employment is spatially clustered around airports and transport-oriented transit hubs to support tourist movements.

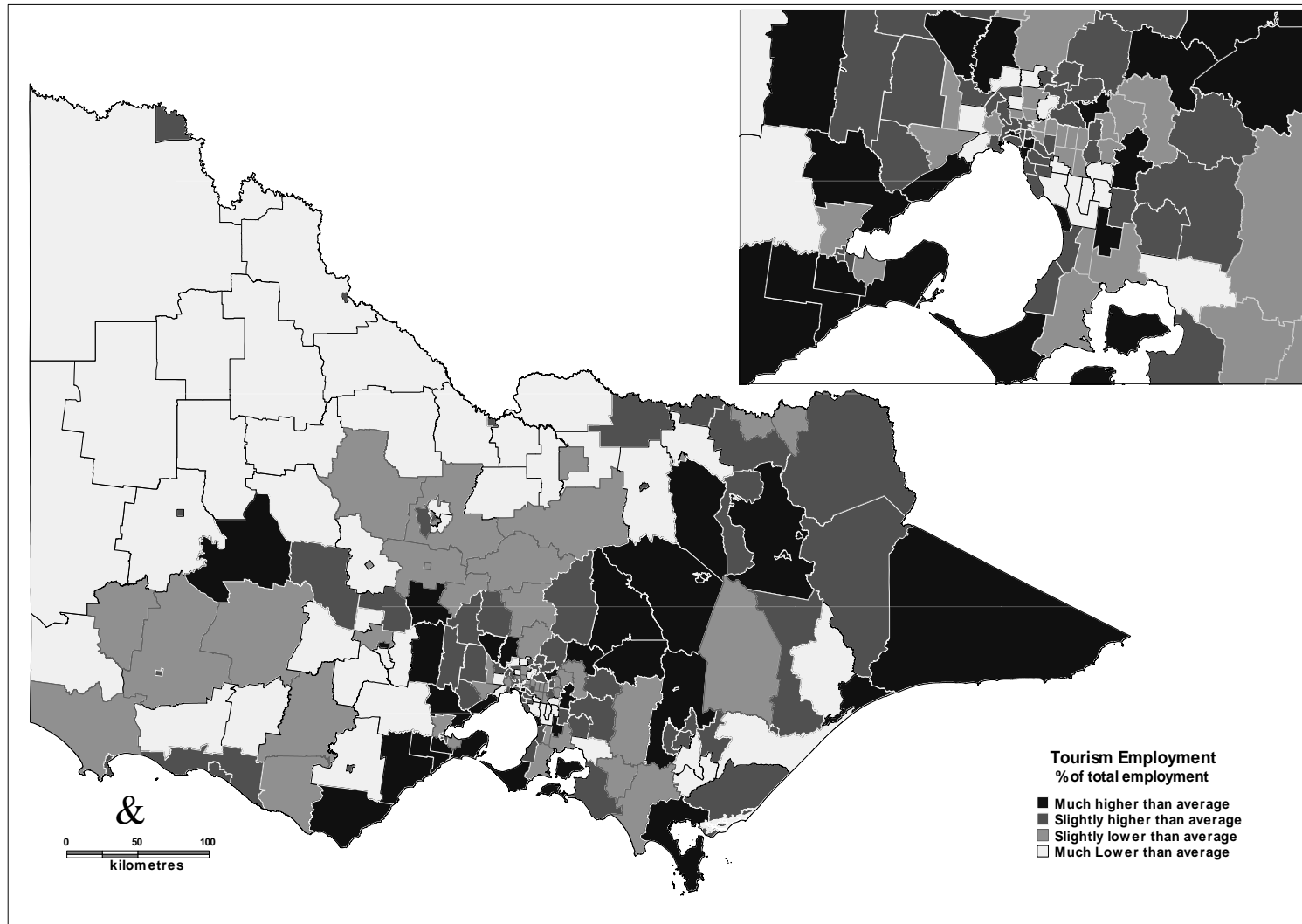


Figure 5.2: Employment landscape of the tourism and hospitality sector in Victoria, Australia

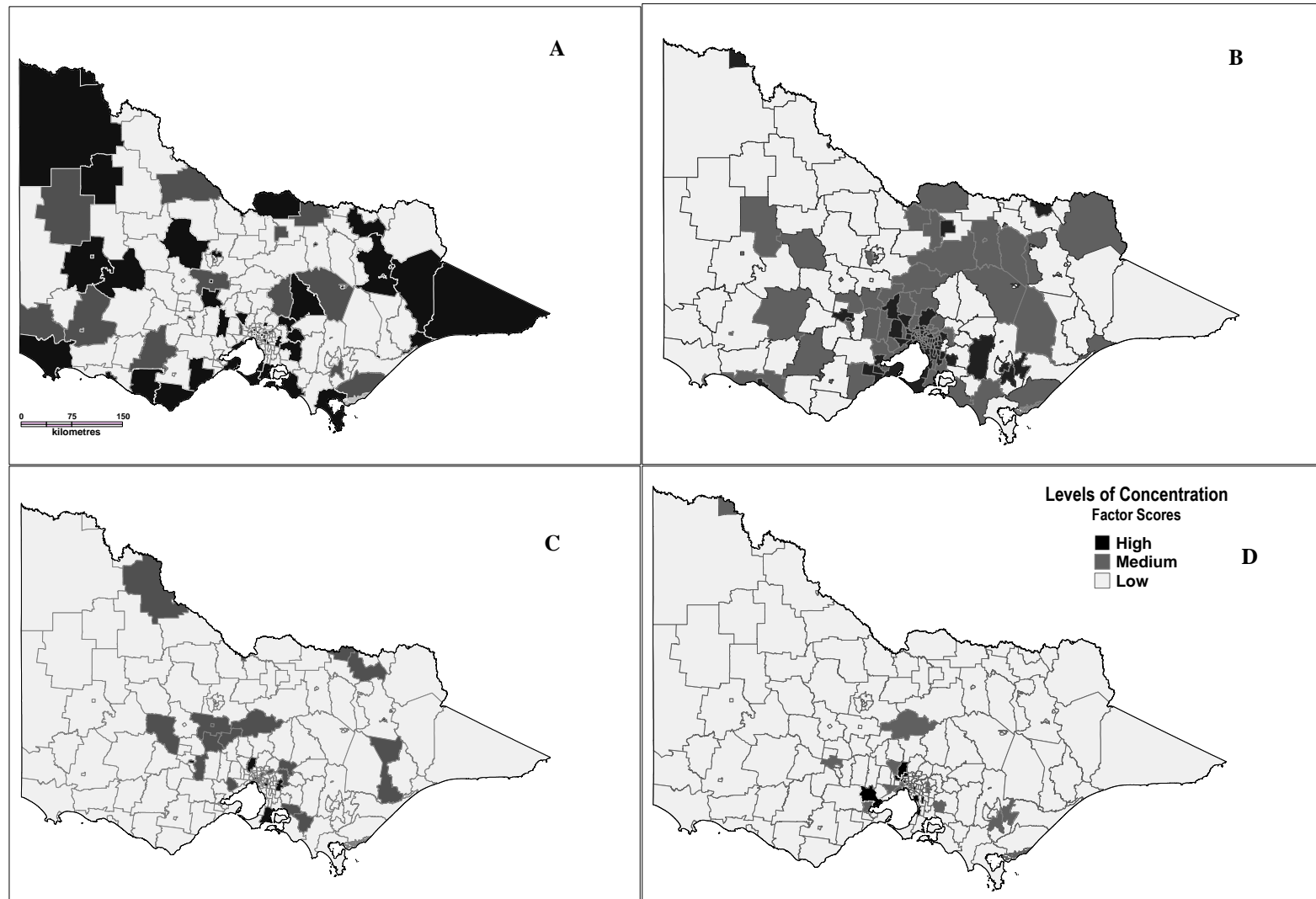


Figure 5.3: Spatial variability in the tourism and hospitality sector employment. A) 'Tourism operational services', B) 'hospitality services', C) 'Entertainment services' and D) 'infrastructure operational facility services'.

5.6 MEASURING INEQUALITY IN TOURISM AND HOSPITALITY EMPLOYMENT

The analysis presented in section 5.5 has identified key spatial concentrations of T&H employment across Victoria. This was examined through the spatial variability in employment. However, one key question remained unanswered: *is the distribution of tourism and hospitality employment significantly different to the distribution of total employment (include all industries)?* This section tackles this question using two complementary techniques, namely the Lorenz curve and Gini coefficient. The first technique graphically illustrates the inequality in the distribution of T&H employment relative to total employment; whilst the second technique computes a single coefficient to measure the degree of inequality. The benefit of using these techniques is three-fold. First is the advantage of using a comparative measure, which quantifies the distribution of T&H employment against a benchmark – the total employment. Second is the advantage associated with the graphical representation of this comparison, which is easy to understand. The third advantage is the computation of a Gini coefficient which allows measurement of the degree of inequality.

Tourism and hospitality employment is shown along a line referred to as the Lorenz curve; whilst the distribution of total employment represents the ‘line of equality’, which is reflected as a diagonal line (See chapter 5 for more detail). Any deviation in the Lorenz curve from the line of equality indicates the degree of inequality in relative terms. The key assumption tested here is to demonstrate, both graphically and quantitatively, whether the employment in T&H industry exhibits a similar distribution pattern to that of total employment in all industries. If the Lorenz curve aligns along with the line of equality, then there is no difference between the two.

In Figure 5.4, the Lorenz Curve shows the cumulative percentage of T&H employment plotted on the y-axis against the cumulative percentage of total employment on the x-axis. As shown in Figure 5.4, the gap between the line of equality and the Lorenz curve is small, which indicates a marginal or insignificant difference in the distribution of employment between the T&H industry and all industries. However, this doesn't mean that the employment in T&H is equitably distributed across all areas in Victoria. This distribution is just similar to the distribution of total employment in all industries. For example, 50 percent of T&H employment is located within the top 15 percent of Statistical Local Areas (i.e. 30 out of 200). The information in a Lorenz curve can be further summarized using a Gini coefficient. The computed Gini coefficient for Victoria is 0.08, which is close to 0 in a range of 0 to 1. The closer the Gini coefficient to 0, the more equal the distribution. The lower Gini coefficients therefore show parity in the distribution of T&H employment when it is compared with total employment for the State of Victoria.

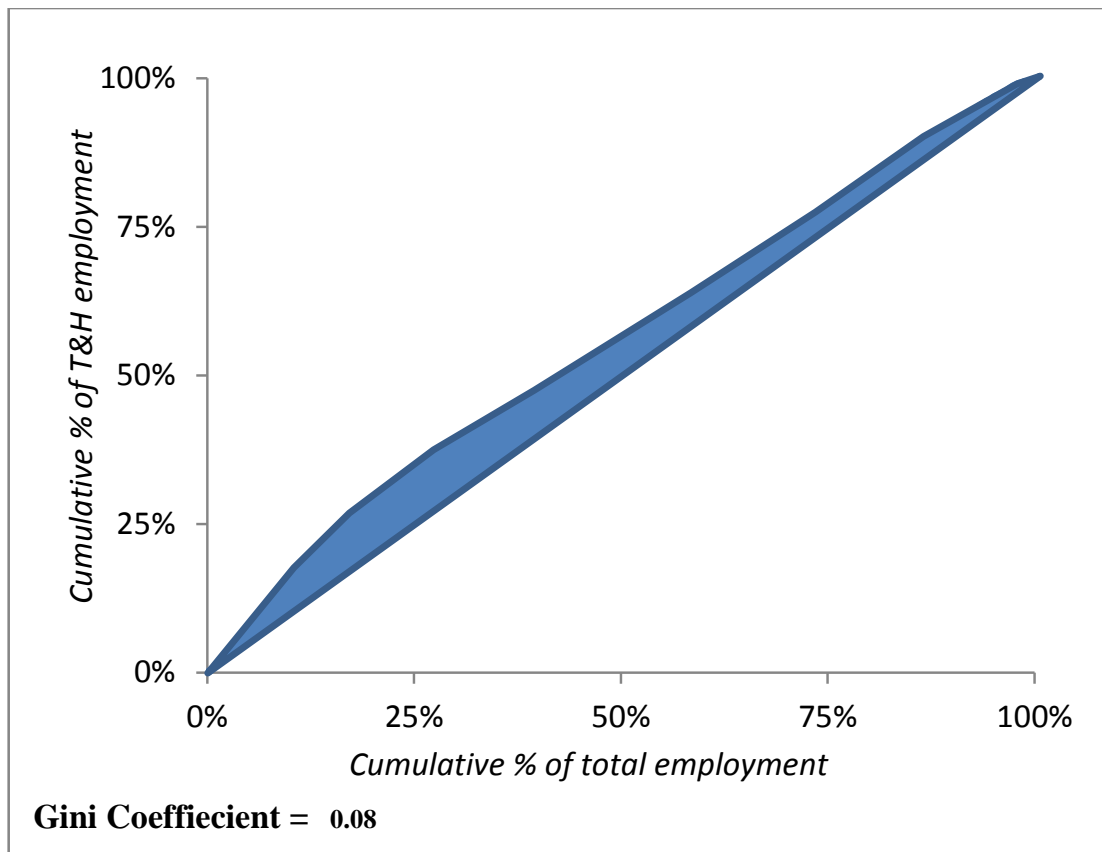


Figure 5.4: Lorenz Curve and Gini coefficient for tourism and hospitality employment in Victoria for 2006

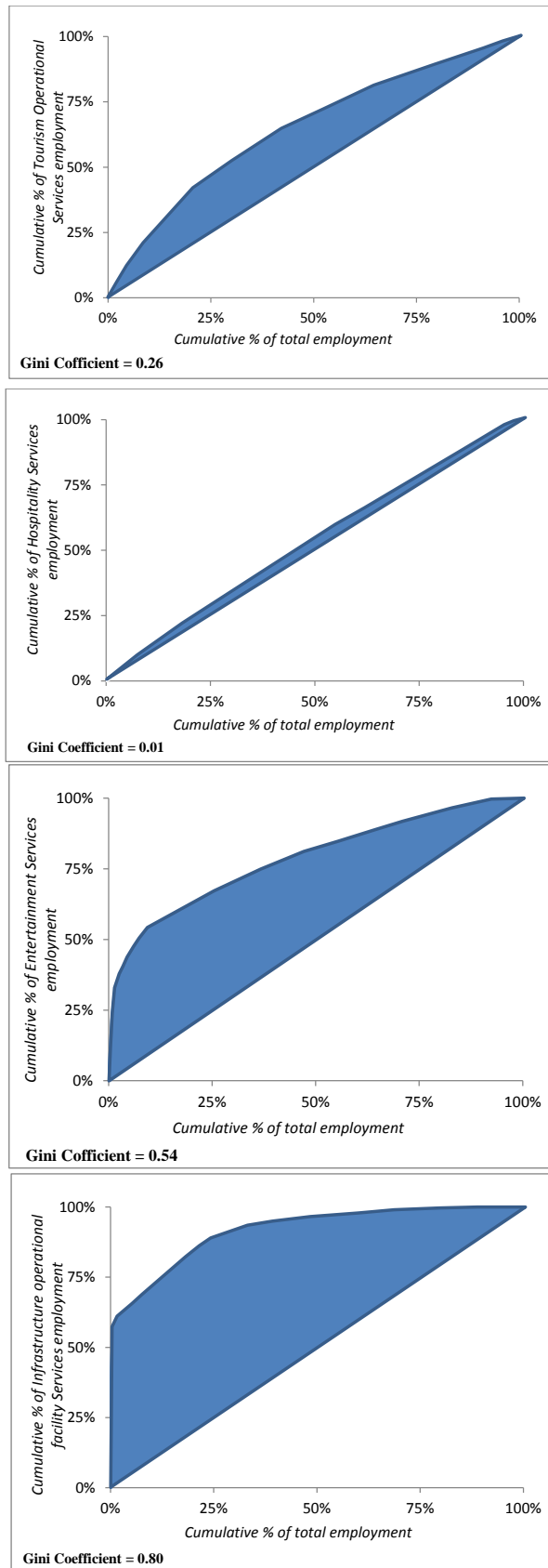


Figure 5.5: Lorenz Curve and Gini coefficient for four key components of tourism and hospitality employment in Victoria for 2006

Four key components of tourism and hospitality employment are also examined. As shown in Fig 5.5, the Lorenz curve and the Gini coefficient are substantially different across different components. Except for Hospitality services, all other components exhibit higher levels of inequality. The highest level of inequality exists in 'Infrastructure operational facilities Services', wherein the 5 top Statistical Local Areas account for about 70 of tourism and hospitality employment. The Gini coefficient of 0.8 further reinforced the results of the Lorenz curve, suggesting unequal tourism and hospitality employment distribution when compared to all employment. Similarly, entertainment services employment also suggests unevenness in employment. Tourism Operation Services employment, on the other hand, has also shown a slightly higher level of inequality, as suggested by the Lorenz curve and Gini coefficient (0.26). Hospitality Services has similar distribution to that of total employment in all industries; whilst the Tourism Operational Service component has more variability in the distribution in relative terms.

In summary, the distribution of T&H employment when comparing it with total employment is rather similar. Similar patterns are strongly manifested in hospitality services employment. However, as highlighted earlier, it cannot be assumed that T&H employment is equitably distributed across different parts of Victoria. The distributive pattern is similar to total employment. Other components, as one would expect, revealed a higher level of inequality, particular with the case of 'Infrastructure operational facilities Services' and entertainment services. It can be inferred that T&H employment such as tourism Operational Services, Entertainment services and Infrastructure operational facilities Services have a more distributed pattern, which is quite different to total employment. Conversely, the hospitality services employment follows the similar pattern of total employment. This is an interesting finding. Analysis at a component level has revealed this

interesting finding, which would otherwise be unnoticed when comparing T&H employment and total employment.

5.7 Tourism and hospitality employment by tourism region

Tourism regions in Victoria are integral to tourism planning and destination marketing. Visitor management plans and destination marketing materials are often designed to promote tourism in tourism regions in Victoria (Tourism Development Victoria, 2013). Tourism Victoria, a State Government agency, generates tourism-related statistics for each of the tourism regions including domestic and international visitation and expenditure, purpose and origin of tourists, the economic contribution of tourism, tourism forecasts and segment and market profiles. Tourism and hospitality employment is therefore aggregated by tourism regions so that the employment statistics can be compared with visitor data. There are 21 tourism regions in Victoria, which offer different types of tourism products and services. In this section, employment statistics for each tourism region across the key components of T&H employment are generated. Aggregation of T&H employment data by tourism region is important to provide a base of evidence to support policy making.

Table 5.5 provides employment statistics across different components of T&H industry by tourism regions. Melbourne, as a popular tourism destination and a gateway to Victoria, has the largest as well as the most diversified employment base in T&H. It employs little more than one hundred thousand workforce in T&H, among which 62 percent work in ‘hospitality services’, 17 percent in ‘tourism operation services’, 12 percent in ‘entertainment services’ and the remaining 9 percent in ‘tourism infrastructure services’. Geelong, Peninsula, and Melbourne East also have high employment numbers in T&H, as shown in Table 5.5.

Table 5.5: Tourism and hospitality employment by tourism region in Victoria (count, per cent, 2006)

Tourism Regions	Tourism Operational Services	Hospitality Services	Entertainment Services	Tourism Infrastructure Services	Total T&H Employment	T&H Employment Density per square km	Location Quotient
Ballarat	623 (20%)	2134 (68%)	335 (11%)	28 (1%)	3120	10.93	0.68
Bendigo	697 (22%)	2336 (74%)	119 (4%)	12 (0.4%)	3164	11	0.67
Central Highlands	259 (38%)	392 (58%)	20 (3%)	3 (0.45)	674	0.07	0.9
Central Murray	450 (34%)	839 (64%)	18 (17%)	3 (0.2%)	1310	2.56	0.63
Geelong	890 (15%)	4360 (75%)	301 (5%)	246 (4%)	5797	32.82	1.26
Gippsland	773 (19%)	2986 (75%)	180 (4%)	42 (1%)	3981	1.93	1.36
Goulburn	382 (19%)	1467 (75%)	102 (5%)	12 (0.6%)	1963	0.6	0.59
High Country	1532 (47%)	1608 (50%)	48 (1%)	6 (0.2%)	3194	6.38	3.28
Lakes	639 (44%)	777 (54%)	23 (2%)	3 (0.21%)	1442	0.44	1.12
Macedon	253 (21%)	867 (74%)	39 (3%)	7 (0.60%)	1166	0.33	0.92
Mallee	632 (31%)	1341 (65%)	49 (2%)	48 (2%)	2070	3.65	0.61
Melbourne	16454 (16%)	61830 (62%)	12509 (12%)	9272 (9%)	100,065	182.93	0.95
Melbourne East	897 (19%)	3593 (77%)	155 (3%)	14 (0.30%)	4659	3.28	1.08
Murray East	309 (24)	883 (69%)	79 (6%)	0	1271	0.45	0.87
Peninsula	974 (16%)	4583 (78%)	273 (45%)	61 (1%)	5891	11.1	1.1
Phillip Island	455 (44 %)	562 (54%)	17 (2%)	0	1034	3.35	2.18
Spa Country	266 (51%)	249 (48%)	7 (1%)	0	522	0.36	1.69
Upper Yarra	298 (58%)	212 (41%)	6 (1%)	0	516	1.32	3.56
Western	1415 (33%)	2740 (64%)	67 (1%)	32 (0.7%)	4254	2.42	1
Western Grampians	324 (29%)	734 (66%)	39 (3%)	10 (0.9%)	1107	6.26	0.7
Wimmera	89 (31 %)	190 (67%)	3 (1%)	0	282	0.01	0.48

Tourism regions in regional Victoria however have higher employment in tourism operational services. For example, Upper Yarra, High Country, Lakes, and Phillip Island are among those where the employment in tourism operational services is above 40 per cent. These regions are popular nature-based tourist destinations. In contrast, tourism regions in larger cities such as Mornington Peninsula, Melbourne East, Geelong and Bendigo have a disproportionately a higher percentage of the workforce employed in hospitality services. Gippsland and Goulburn with a higher proportion of hospitality services employment however represent the regional Victoria. Melbourne alone contains about 62,000 jobs in

hospitality services. Entertainment services are largely concentrated in Melbourne; so are the tourism infrastructure supporting services.

As expected, the employment density, the number of T&H jobs per square kilometre, is relatively high in city-based tourism regions. Tourism and hospitality employment density in Melbourne is 183 workers per square kilometre. In contrast, the employment density in Wimmera, an agriculture-based economy, is only 0.11. The employment concentration in Upper Yarra and High Country is three times higher than the State of Victoria, as indicated by location quotient (LQ). Wimmera, Goulburn, and Central Murray have the LQ of less than 1. This suggests lower employment concentration and dependency on the T&H industry. More interestingly, the LQ of Ballarat and Bendigo, which are known tourist destinations, also falls below the Victorian national benchmark.

5.8 Analysing the supply and demand in the tourism and hospitality industry

The previous section investigated the concentration of T&H employment by tourism region for various measures. The employment size is indicative of workforce supply. Whether the supply of T&H workforce in relation to demand for services is high or low is yet to be examined. One approach to establishing this is to use visitor numbers as a proxy indicator for demand. As argued by Dalton et al. (2013) there is potentially a weak relationship between demand and supply and associated market failure is possible when employers have difficulty attracting qualified workers for jobs in a particular area or workers struggle to get employment in a particular area. As Shah and Burke (2003, p. 20) note: ‘The performance of a labour market varies across regions. One aspect of this geographical disparity could be that while some regions may have shortages of particular skills other regions may have surpluses’.

Any rigidities and bottlenecks in labour supply due to a mismatch between the location of labour supply and the demand for services could potentially contribute to higher prices for tourism services and increased accommodation costs. In this section, the supply of labour is represented by total T&H employment and the demand for T&H services is represented by the number of visitors. The assumption is– the higher the number of visitors, the higher the demand for T&H services. A simple scatter diagram is used to explore the relationship between the size of employment and the number of visitors. The *x* axis represents the size of T&H employment and *y* axis represents the number of visitors – a proxy indicator for the demand for services. The demand for services is also analysed across three major categories of visitors: i) daytrip visitors; ii) the total number of overnight trips; and iii) international visitors.

In Victoria, there were a total of about 20 million domestic daytrip visitors (includes interstate trips and intrastate trips) in 2006. The T&H services were delivered by a pool of 147,000 workers in the T&H industry. Of this, Melbourne held the largest number of daytrip visitors as well as the number of people employed, which accounts for about 70 percent of total employment.

Figures 5.6, 5.7 and 5.8 all show relationships between the supply of the T&H workforce and the total number of visitors to Victoria. Overall, there is concordance between the demand and supply, meaning as demand for T&H services increases, the supply of labour also increases. Put simply, the more visitors a tourist region attracts, the larger the size of the workforce supplied. Hence, there is a strong positive relationship between demand and supply, which suggests the efficient functioning of the local labour tourism market in different parts of Victoria.

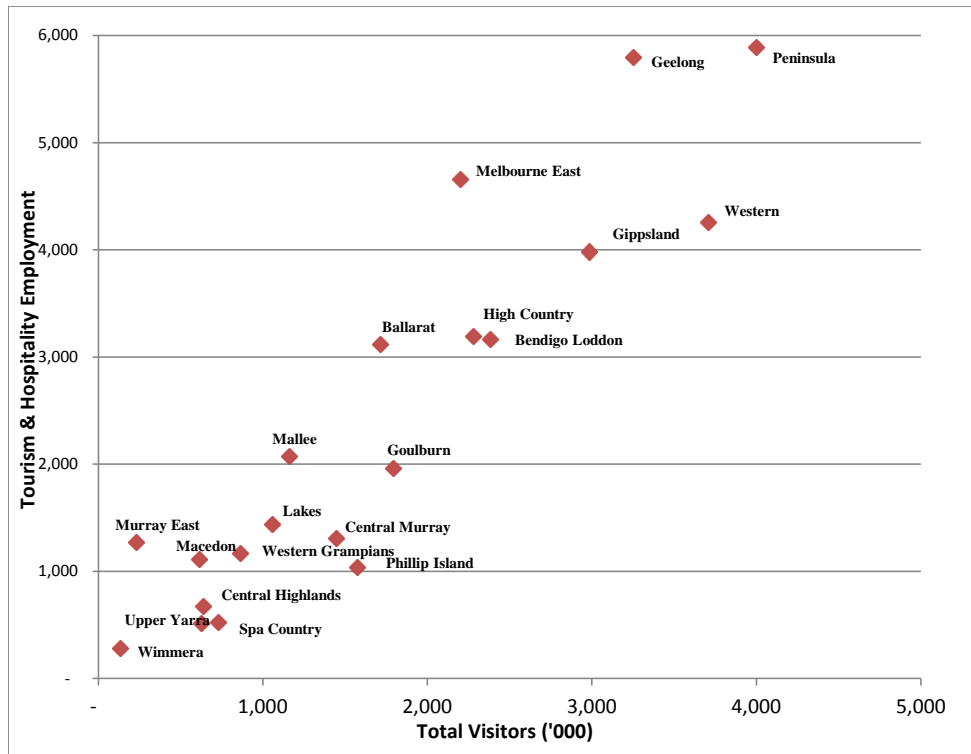


Figure 5.6: Relationship between T&H employment and total visitors 2006, Victoria

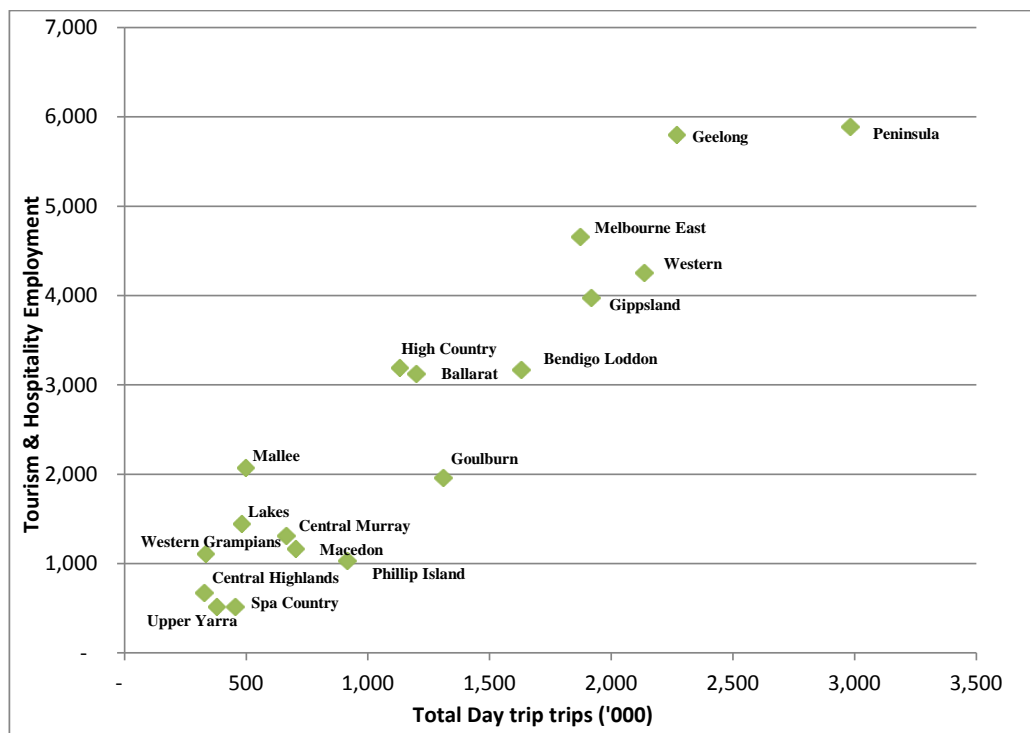


Figure 5.7: Relationship between T&H employment and total number of day trips 2006, Victoria

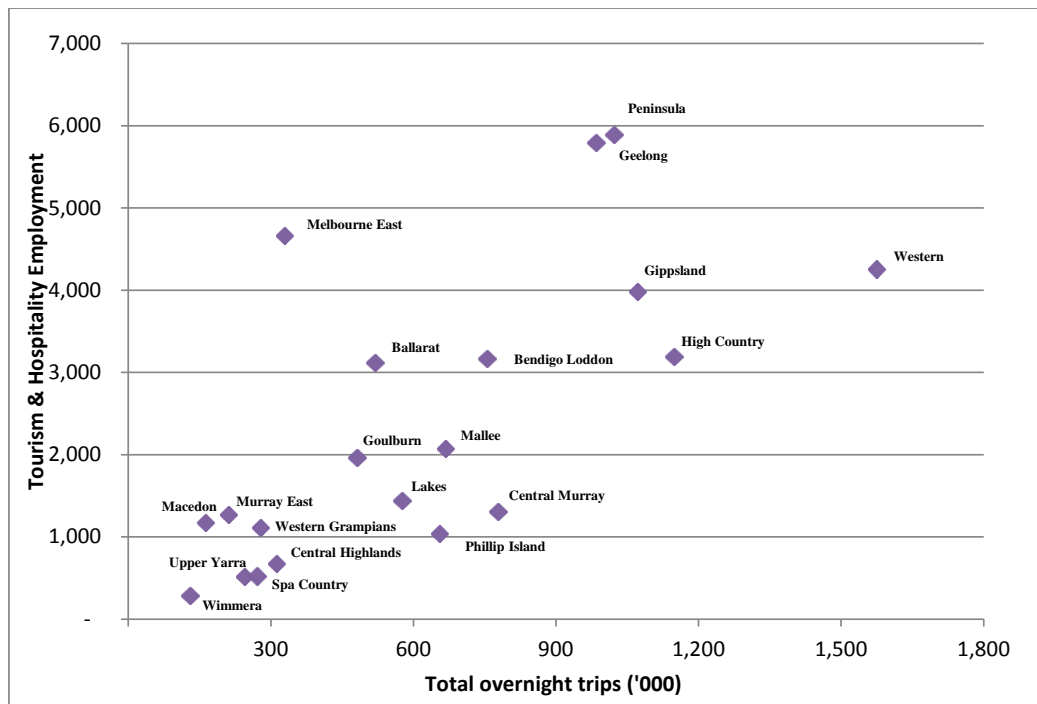


Figure 5.8: Relationship between T&H employment and total number of overnight trips 2006, Victoria

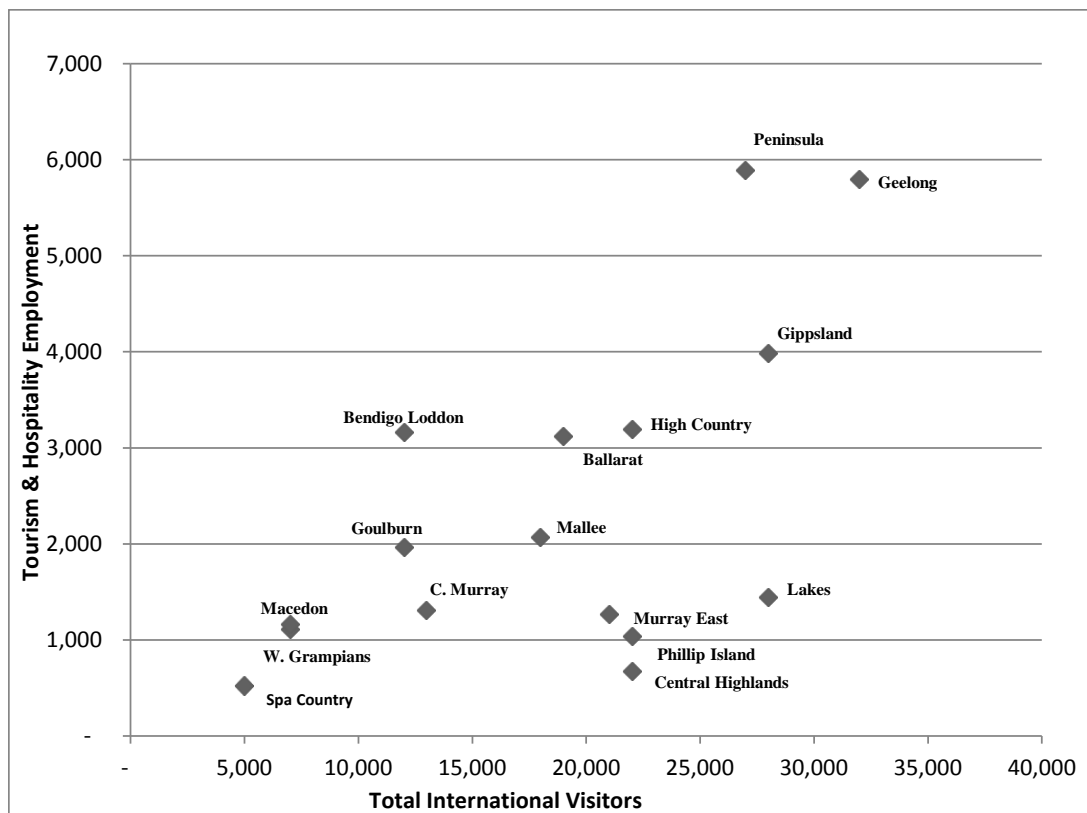


Figure 5.9: Relationship between T&H employment and total international visitors 2006, Victoria

Three data points (i.e. Melbourne, Wimmera and Murray East) were excluded from the analysis because they are data outliers. Wimmera and Murray East, interestingly, have no reported visitors in 2006, but they had T&H employment (282 and 1,271 respectively), which perhaps exist to cater the needs for hospitality services of local residents.

In Figure 5.8, there are few tourism regions that show a slight deviation from the overall trend. For example, Melbourne East, Ballarat, and to some extent, Geelong and Peninsula have a higher supply of labour and relatively low demand for T&H services, estimated from the total number of overnight trips. The extra labour supply might be engaged in providing hospitality services to local residents. Melbourne East and Geelong offer inner city and coastal lifestyle including café culture and dining experiences. Another observation includes the impact of geographic distance, which plays a vital role in explaining the types of relationship between demand and supply. Generally, the number of overnight stays increases with an increased distance from the Melbourne CBD as the overnight stay becomes a necessity, not a choice. Tourism regions such as Western, High Country and Gippsland in regional Victoria, for example, are more likely to attract more overnight visitors than those situated closer to Melbourne city. Overnight stays could also mean high demand for T&H services. Conversely, the tourism regions, which are located closer to Melbourne, tend to attract more day visitors (Figure 5.6).

In conclusion, tourism regions that attract more visitors generally tend to generate more employment in T&H. Thus, there is no spatial mismatch between the demand for T&H services and supply of workforce. The workforce is abundant and critically located where they are needed, assuming the demand is driven by the volume of visitors or trips. Popular tourist regions including Geelong, Peninsula, and Western tend to attract more tourists as

well as the tourism and hospitality workforce. There are few outliers, but the overall pattern shows a linear relationship between demand and supply.

5.9 SUMMARY

This chapter examined the location, characteristics and the key components of T&H employment in Victoria. Using the Australia New Zealand Standard Industry Classification, the key sub-industries (Class) directly related to the T&H industry were first identified. The total numbers of individuals working within these sub-industries were then aggregated at the level of Statistical Local Areas and Tourism Regions. Principal component analysis was applied to extract the underlying components of T&H employment. These components were also mapped to identify the spatial variability in T&H employment. The relationship between the supply of T&H workforce and the demand for T&H services (number of visitors or trips) was also examined to investigate whether areas of high demand correspond with high supply of labour or *vice versa*.

This chapter concludes with the following statements:

- In 2006, the total employment in the T&H industry was 7.74 per cent of total employment in Australia. ‘Cafes and Restaurants’ was the single largest tourism and hospitality related employer, followed by Takeaway Food Services and Accommodation.
- Four components were extracted that collectively characterise the underlying structure of T&H employment. ‘Tourism operational services’ employment is largely based around tourism destinations and thus is more widely dispersed across Victoria. ‘Hospitality services’ employment is heavily concentrated in Melbourne and regional cities/towns such as Ballarat and Bendigo. Infrastructure operational facility services

are relatively more spatially concentrated around the Melbourne Tullamarine airport and inter-modal hubs, whilst ‘Entertainment services’ employment is predominately located in Central Melbourne.

- The employment concentration in Upper Yarra and High Country is 3 times higher than the State of Victoria, as measured by location quotient (LQ). Wimmera, Goulburn, and Central Murray have LQ values of less than 1, which suggests low dependency on tourism. More interestingly, the LQ values of Ballarat and Bendigo, which are known tourist destinations, are also below the State level.
- The T&H employment is correlated with tourist visits. Tourism regions that attract more visitors generally tend to generate more T&H employment. Thus, there is no spatial mismatch between the demand for tourism and hospitality services and supply of workforce. The workforce is abundant and critically located where it is needed, assuming the demand is driven by the volume of visitors or trips. This might indicate that local tourism labour markets are functioning efficiently. Popular tourist regions such as Geelong, Peninsula and Western tend to attract more tourists as well as the tourism and hospitality workforce.
- The distribution of T&H employment is similar to total employment. Hospitality services employment also follows the similar pattern to that of total employment. It does not however mean that the employment is equitably distributed across different tourism regions. ‘Infrastructure operational facilities Services’ and entertainment services, on the other hand, are inequitably distributed.

The next chapter will identify the key spatial T&H employment clusters and will ascertain the key drivers that underpin the employment clustering.

CHAPTER 6

MODELLING SPATIAL TOURISM AND HOSPITALITY

EMPLOYMENT CLUSTERS

6.1 INTRODUCTION

This chapter maps the key spatial T&H employment clusters and identifies the location-specific contextual factors shaping the clustering of tourism and hospitality employment. The chapter begins with mapping the key spatial concentrations of T&H employment using a range of measures. Spatial tourism and hospitality clusters, defined as areas of high T&H employment surrounded by neighbouring areas of high T&H employment, are identified using spatial autocorrelation methods. Finally, the impacts of context-specific characteristics of geographic space on the clustering of T&H are then estimated using spatial econometric techniques.

This chapter specifically addresses the following three inter-related research questions.

- Is employment in tourism and hospitality spatially clustered? If so, do they spatially vary across different statistical measures?
- Where are the key spatial tourism and hospitality employment clusters?
- What are the significant location-specific factors that drive tourism and hospitality employment clustering in Victoria?

6.2 TOURISM AND HOSPITALITY EMPLOYMENT SPATIAL CONCENTRATIONS

Mapping of T&H employment is carried out to examine whether different statistical measures generate different spatial patterns. Four key measures are applied as each measures different aspect to generate different outputs. For example, total count is an absolute measure which enables identifying the size of T&H employment; which employment density is a relative measure which takes into account the employment per square unit of area. As explained in chapter 4, the location quotient is a valuable way of

quantifying how concentrated the T&H employment is in an area as compared to the State of Victoria. These measures include:

- i) Total number of T&H employment in an area;
- ii) The proportion of T&H employment to total employment in an area;
- iii) Employment density – the number of T&H employment per square kilometre; and
- iv) Location quotient - concentrated the T&H employment in an area as compared to the State of Victoria.

Using these measures, four maps are generated, each showing a different spatial T&H employment pattern in Victoria. The first map in Figure 6.1 shows that the T&H employment is highly concentrated in areas within Melbourne. There are, however, second-tier regional cities, such as Geelong, Ballarat Central, and Bendigo, which have also shown high numbers in employment in the T&H industry. Overall, it is a city-centric concentration of T&H employment. Higher proportions of the workforce employed in city-oriented hospitality or infrastructure operational services might have driven such spatial patterns. Regional Victoria has not shown much concentration of employment in the T&H industry. The employment count is however an absolute measure. Employment density is a relative measure as it measures the concentration of employment in relation to the size of an area. Employment density is computed as the number people working in the T&H industry per square kilometre. The employment density map in Figure 6.2 shows even higher levels of employment concentration than the total employment count. T&H Employment is densely clustered in Melbourne CBD, inner city suburbs and along the eastern corridor. Geelong, Mornington Peninsula and Phillip Island, have also shown high T&H employment density. These two measures thus show similar spatial concentrations of T&H employment in Victoria.

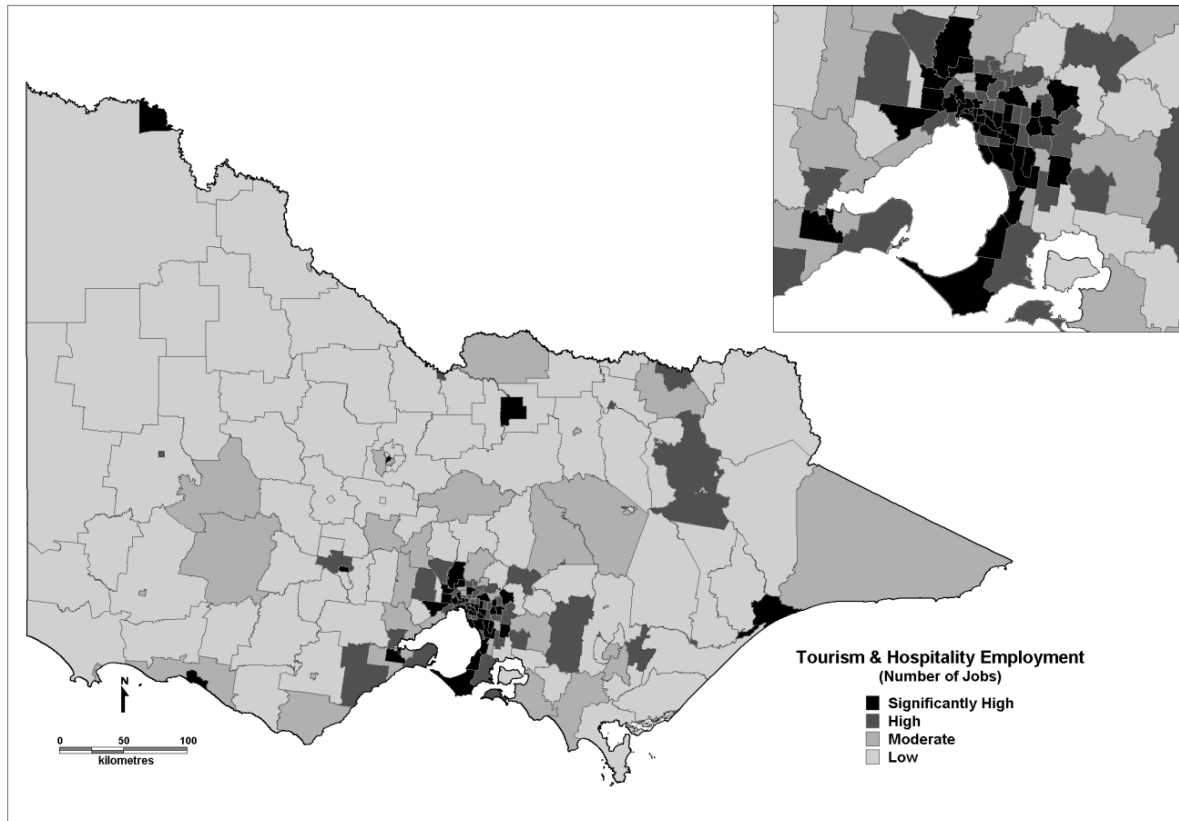


Figure 6.1: T&H Employment in Victoria – the total employment count

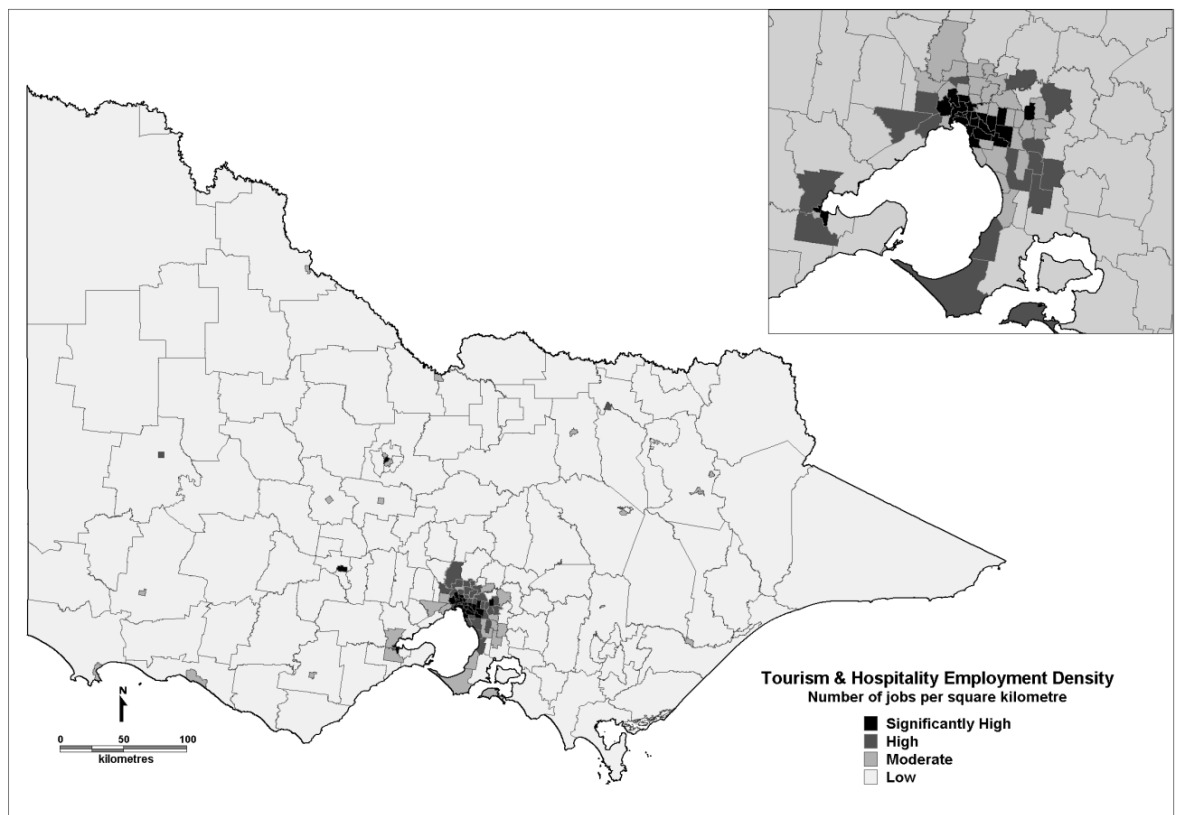


Figure 6.2: T&H Employment in Victoria – employment density measure

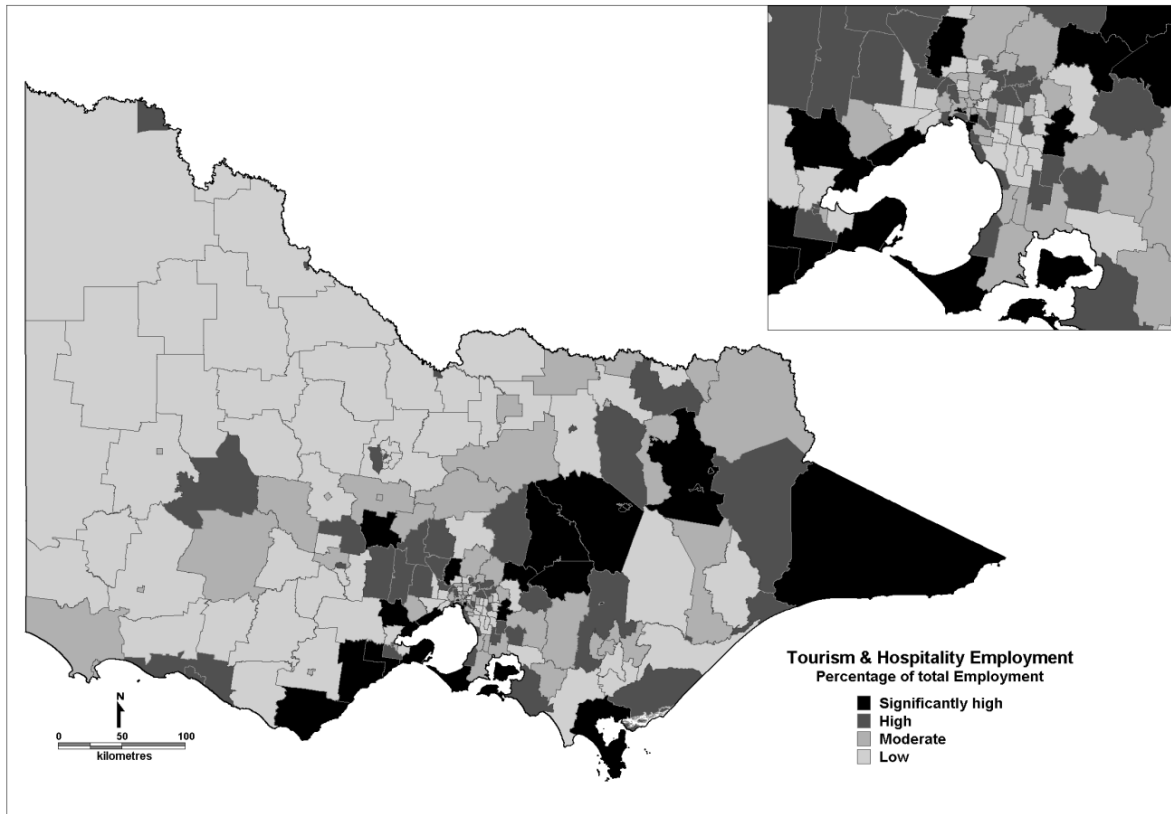


Figure 6.3: T&H Employment in Victoria – %age of T&H employment to total employment

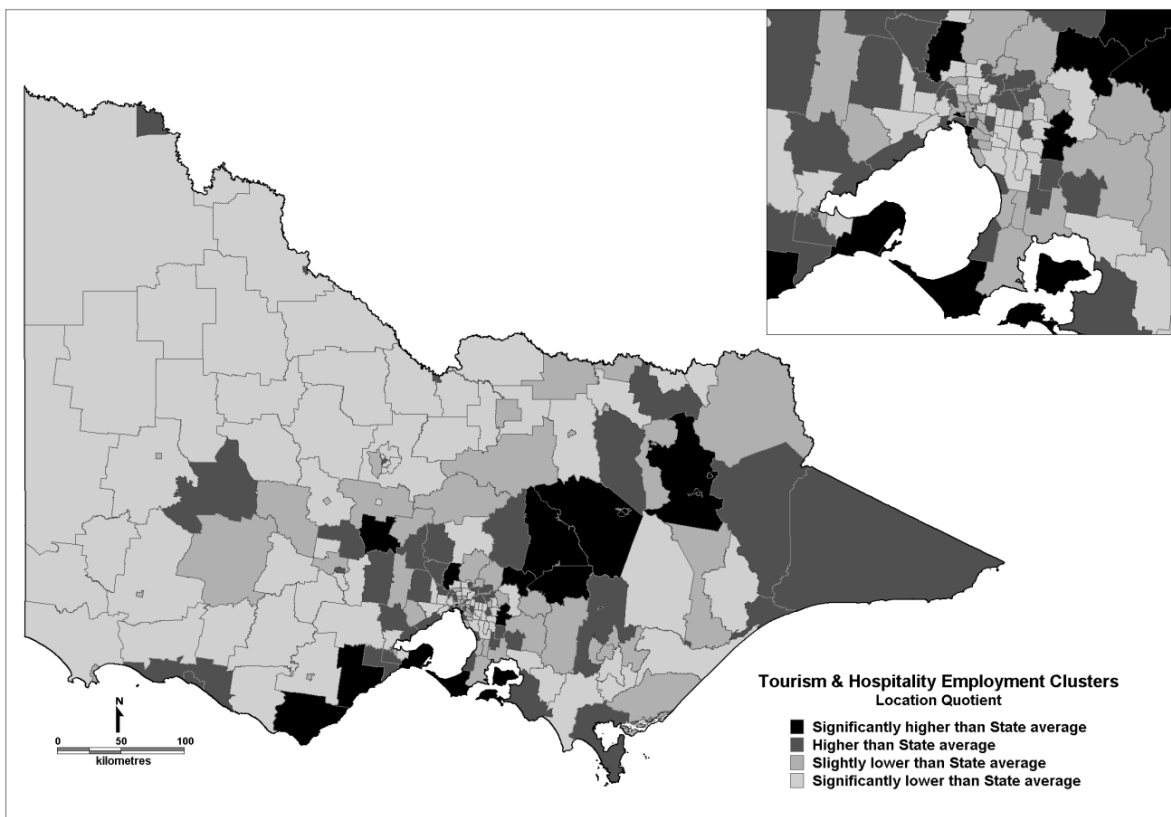


Figure 6.4: T&H Employment in Victoria – location quotient measure

The percentage of employment in T&H to total employment however generates somewhat different results. T&H employment as shown in Figure 6.3 is relatively less concentrated in Melbourne. The relative share of T&H employment to total employment in Melbourne is low because of a large employment base. Conversely, the areas in regional Victoria have a higher proportion of employment in T&H, thus making them more dependent on the T&H industry. Areas in the Alpine region and along the coast, such as the Great Ocean Road, and Phillip Island have high concentrations of T&H employment.

Location quotient (LQ) is a relative measure, which shows how concentrated employment is in an area compared to a larger geographic area such as the state or nation. Two separate benchmarks are used to differentiate the concentration of T&H employment between regional and metropolitan-based statistical local areas. LQ values are computed either against the Metropolitan or regional Victoria for all areas relative to their location. LQ of 1 indicates that the ratio between T&H employment to total employment in an area is the same as that of its benchmark (Metropolitan/Regional Victoria). Whereas the LQ of 2 shows the concentration of T&H employment in an area is twice the size of Victoria. The LQ map in Figure 6.4 identifies the key spatial concentrations of T&H employment, where the employment concentration is much higher than the national or metropolitan benchmark. The spatial pattern on LQ map is quite similar to Figure 6.3, which shows the percentage of T&H employment to total employment. The popular tourist destinations in regional Victoria tend to hold high LQ values, which are significantly higher than the average of their respective counterparts.

In summary, the measures of employment count and employment density have resulted in similar spatial T&H employment patterns. These two measures have more concentrated and

city-centric spatial patterns of T&H employment. The percentage measure and LQ however have generated different results, which highlighted the key employment concentrations in rural and regional Victoria. Popular tourist destinations in regional Victoria have also shown high employment concentrations. The percentage distribution and LQ suggest more spatially dispersed patterns. A careful use of such measures is therefore recommended, as the outputs generated from these measures vary substantially.

In this research, the measure of LQ is used as a variable to represent the degree of spatial clustering of T&H employment. There are two key reasons for choosing LQ as a measure of T&H employment concentration. Firstly, it is a relative measure, thus it allows comparisons of the concentration of T&H employment between different areas within a larger geographic region. The range of LQ values is also easy to understand and interpret. It provides a scale on which concentration of T&H employment can be quantified against a common reference point – the metropolitan Melbourne or regional Victoria. Secondly, the mapped LQ outputs have shown more discernible spatial patterns, which highlight the extent of economic dependency of areas on the T&H industry in regional Victoria. The spatial pattern is also more dispersed. It captures the localised spatial concentration of T&H employment in places like regional cities, popular tourist destinations, and isolated resort-like tourist destinations.

6.3 IDENTIFYING SPATIAL TOURISM AND HOSPITALITY CLUSTERS

The key spatial concentrations of T&H employment in Victoria were identified in the previous section. However, the extent to which areas of high concentration of T&H employment create spatial clusters is yet to be quantified. Using spatial autocorrelation measures, this section identifies the key spatial T&H employment clusters and characterise

their employment structure. It begins with the global measure of Moran's I and then implements the local indicator of spatial autocorrelation.

6.3.1 Spatial autocorrelation – Moran's I

Moran's I calculates a global measure of spatial clustering of T&H employment. Spatial autocorrelation simply measures correlation of a variable with itself through space. Positive spatial autocorrelation exists when high or low values of a variable cluster in space; whilst negative spatial autocorrelation denotes when areas are surrounded by neighbours with very dissimilar values of the same variable (see Chapter 4 for more detail). A spatial weights matrix using the 'first-order contiguity' is computed, where areas with common borders are registered as neighbours. That is, if two spatial units (i.e. areas) have a common border of non-zero length then they are considered 'neighbours'. A value of 1 is then assigned to areas with common border, otherwise a value of 0 (not neighbours).

The computed Moran's I of T&H employment is 0.59, which indicates a positive spatial autocorrelation. The p-value is statistically significant, and the z-score is positive. Thus, the null hypothesis is rejected – high T&H employment values and/or low values are more spatially clustered than would be expected if underlying spatial processes were random. High Moran I statistic suggests that the spatial pattern of T&H employment is clustered and there is a prevalence of spatial dependence in observations. In other words, areas that are close together have similar values (i.e. employment LQ values) than those that are some distance apart. The result indicates that areas of high concentration of T&H employment are more likely to be surrounded by high employment values. This also suggests a tendency for 'spill-over effect' whereby a high concentration of T&H employment in a particular area exerts a positive effect on its neighbours.

6.3.2 Local Indicators of spatial autocorrelation (LISA)

Moran's I is a global measure, which assesses the spatial autocorrelation across the whole dataset. However, it does not take into account the localised clustering of T&H employment. Local Indicators of spatial autocorrelation (LISA) is a technique that detects the occurrence of local clusters within a geographic space. The Local Moran I statistics are therefore calculated for each of the SLAs in order to identify the spatial clusters of similar or dissimilar employment LQ values. LISA statistics identify spatial clusters of positive or negative autocorrelation and detects abnormal observations in data (outliers). The Z scores are computed, which suggest less than one per cent likelihood that clustering could be the result of random chance. P-values in LISA statistics show which clusters/outliers are statistically significant compared to spatial randomness.

One method of interpreting the LISA statistics is to plot the values on a scatter plot, which illustrates the type and strength of spatial autocorrelation. It shows the extent of linear association between the values in a given location (x-axis) with values of the same variable in neighbouring locations (y-axis). Figure 6.5 shows the relationship between T&H employment LQ values (x) at a particular area and the "spatial lag" of x, - that is the average of LQ values of x for its neighbours. The Moran scatter plot regresses a spatially lagged transformation of T&H employment LQs (y-axis) on the original standardised T&H LQ (x-axis). The values of X are standardized in standard deviation units with a mean of zero and a variance of one. The slope of the regression line is the Local Moran's I , which can be interpreted as the correlation between variable x and spatial lag. The average of all Local Moran indices computed for each of the areas within Victoria is proportional to the global Moran's I .

Four quadrants in Figure 6.5 are conceptualised to interpret the results of positive or negative spatial autocorrelation.

Quadrant 1 represents those areas that have lower LQ values of T&H employment surrounded by areas with high LQ values of T&H employment.

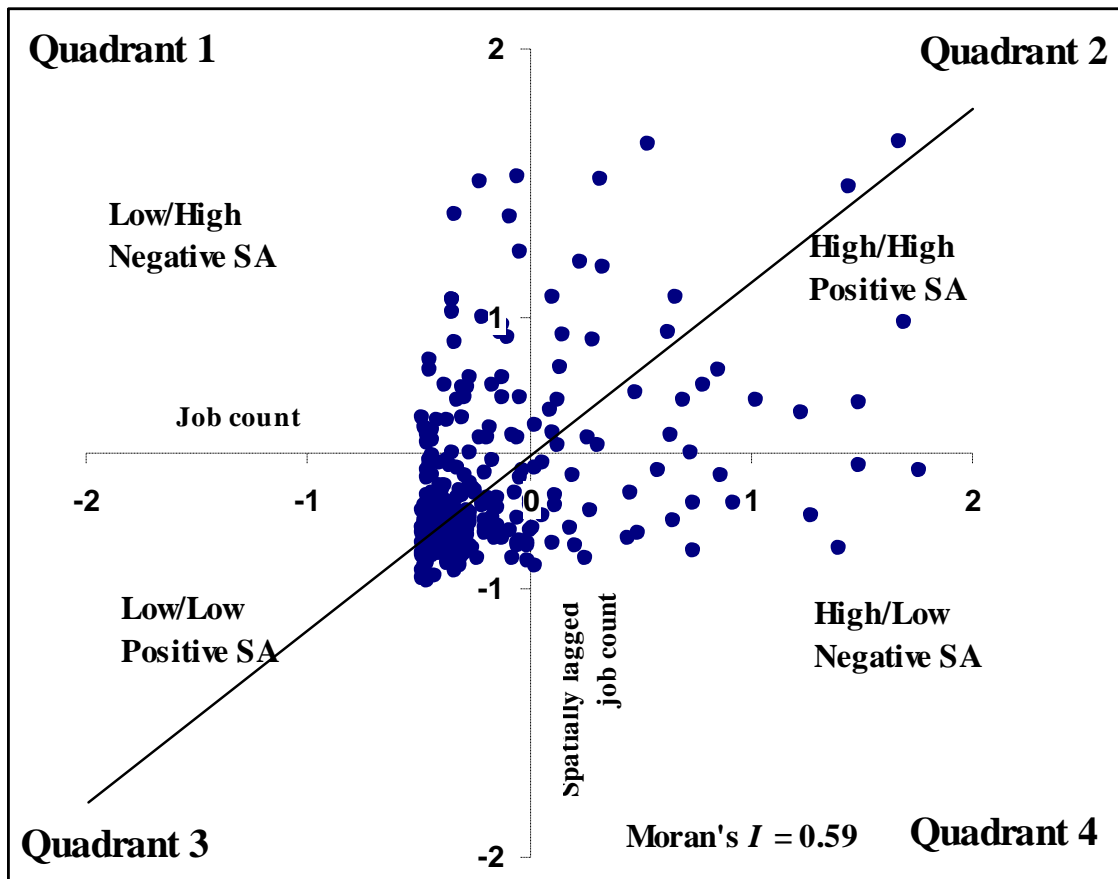


Figure 6.5: Moran plot depicting the positive and negative spatial autocorrelation.

Quadrant 2 consists of those areas with high LQ values of T&H employment surrounded by areas with high values. These areas are called ‘hotspots’ as they reflect a positive spatial autocorrelation, a state of high-high (HH) LQ values. These hotspots are identified as the key spatial T&H employment clusters, which collectively represent a set of contiguous homogenous areas (i.e. similar values) where T&H employment is spatially agglomerated.

Quadrant 3 contains low LQ of T&H employment in an area surrounded by SLAs also with low LQ. These areas have low level of T&H employment, which suggests limited T&H employment opportunities available in these areas.

Quadrant 4 represents high employment LQ SLAs with low LQ T&H employment neighbours. These are isolated pockets with the potential to grow into a more successful spatial employment cluster as the initial impetus required for tourism development already exists. Among these SLAs, Mildura in the north-west, and Wilson's Promontory to the south-east of Melbourne have high concentrations of T&H employment but are surrounded by lower levels of employment in T&H.

6.3.3 A typology of spatial Tourism & Hospitality employment clusters

Five distinct spatial T&H employment clusters are identified (areas coded in dark black), which comprise 27 SLAs in Victoria as shown in Figure 6.6. These clusters include: *i*) a spatial cluster along the Great Ocean Road scenic drive; *ii*) a spatial cluster around the Mornington Peninsula and Phillip Island (known for the Penguin colony); *iii*) a spatial cluster around the Alpine region; *iv*) a cluster associated with gold mine settlements around Ballarat and Bendigo; and *v*) a spatial cluster based in Melbourne CBD. These spatial T&H clusters are discussed and characterised as follows.

6.3.3.1 Cluster 1 – CBD-based, urban-oriented, gateway-driven employment cluster

The '*CBD-based, urban-oriented, gateway-driven employment cluster*' is a metropolitan destination, which comprises a large and diversified employment base to provide high-volume T&H services. This cluster attracts both strong inflows and outflows of tourists. It is a base destination from which day trips to destinations in Greater Melbourne's surrounding areas are undertaken. This cluster employs the largest percentage of T&H labour force. 'Accommodation', 'Cafes and Restaurants' and 'Casino Operations' are the key sub-

industries within this cluster. This spatial cluster is also a well-integrated transportation and intermodal hub, which provides services to tourists who plan to travel to other tourist destinations by air, bus or train. ‘Air and Space Transport’ and ‘Air Operations’ are the core services which are offered at the Tullamarine Melbourne Airport in handling domestic and international tourists in Melbourne.

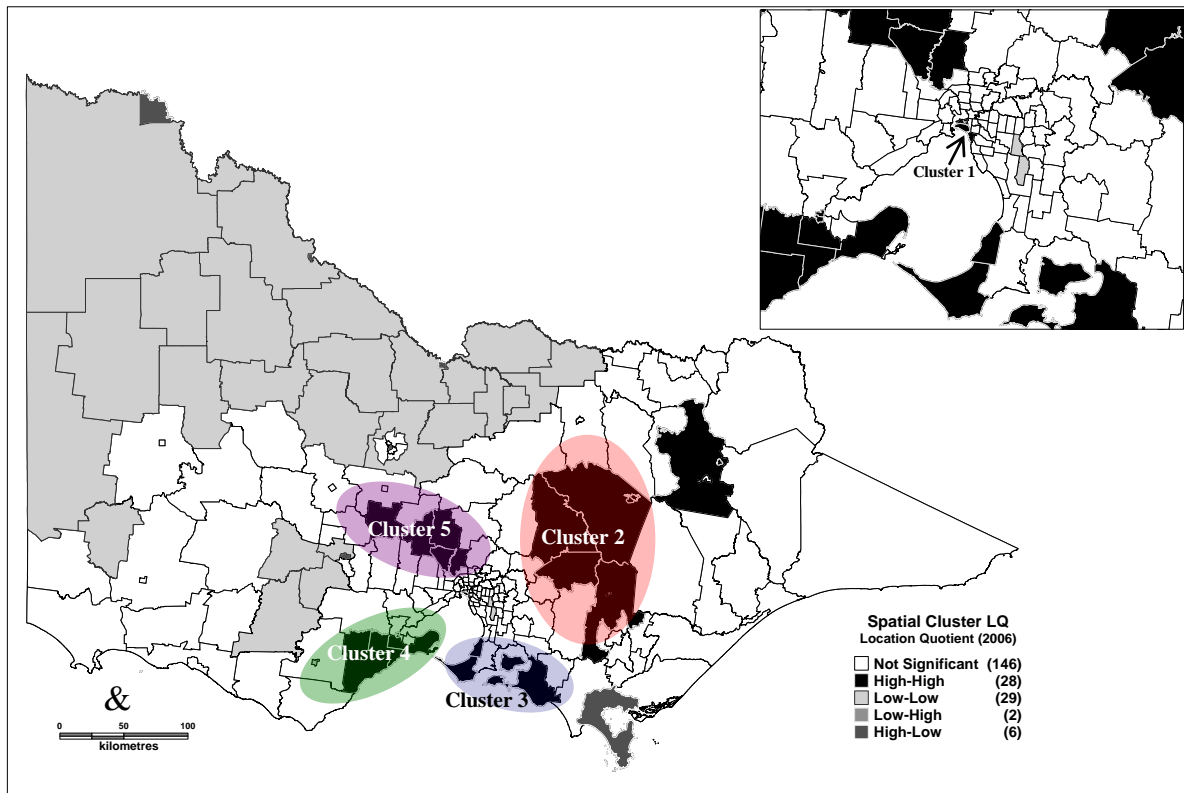


Figure 6.6: Spatial tourism and hospitality employment clusters in Victoria, Australia

6.3.3.2 Cluster 2 – Nature-based national parks, snow-based employment cluster

The ‘nature-based national parks, snow-based employment cluster’ is a natural environment destination. It is located at a relatively long distance from Melbourne. The cluster represents a sparsely distributed settlement system with the absence of a large city. This spatial cluster offers a range of nature-based recreational activities, including skiing, hiking, and downhill mountain-biking. Strict management policies and park management rules however apply to maintain the natural base of the tourist attractions within the cluster. The visit to this cluster often requires an overnight stay for people visiting from Melbourne or Sydney.

Accommodation and Café and Restaurants are the largest employers of T&H workforce. Several popular tourist destinations such as Mt. Buller, Mt. Hotham, Falls Creek, Healesville Sanctuary and Mansfield Zoo are part of this cluster. This cluster is also known for wine tourism, particularly the Yarra Ranges. During the peak snow session, this cluster attracts a large pool of casual workers, including backpackers visiting Australia from overseas.

6.3.3.3 Cluster 3 –Nature based, Phillip Island oriented employment cluster

The ‘*nature-based Phillip Island oriented employment cluster*’ is largely driven by the Penguin Parade and nature-based tourism at Phillip Island. Sea change and peri-urban life styles pursued by some of the local residents, who re-located from bigger cities to the area, generate demand for T&H services. The cluster is also attractive as holiday homes for affluent Melbournians who make a frequent visit to the area. It is also home to the V8 Car Racing event, which generates sessional demand for employment. The employment base of this cluster however is small, but its share to total employment within the cluster is relatively large. Since this cluster is situated in close proximity to Melbourne and is largely driven by mega-events, it thus generates employment at the origin, which is Melbourne.

6.3.3.4 Cluster 4 – Great Ocean Road aligned, Beach-oriented, Coast based cluster

The ‘*Great Ocean Road aligned, beach-oriented, coast-based employment cluster*’ contains approximately 9 per cent of total T&H employment. This linear-shaped employment cluster is a peripheral urban destination with relatively small population base, located in the vicinity of two large cities – Melbourne and Geelong. This cluster includes areas such as Bellarine-Inner, Geelong, South Barwon, Surf-Coast and the historic township of Queenscliff. The large majority of employment in this cluster is in ‘Accommodation’ and ‘Cafes and Restaurants’. The main tourist attraction of this cluster is the scenic drive along Great Ocean

Road, which traverses along a series of beaches and through a range of geomorphological coastal limestone features.

6.3.3.5 Cluster 5 – Gold fields, Transit-oriented employment cluster

The ‘*Gold fields, heritage-oriented employment cluster*’ is situated within the gold fields in the historic townships of Ballarat and Bendigo-Castlemaine area. This cluster is also known for natural springs in Hepburn Springs and Daylesford. Though interspersed with urban townships, this cluster largely represents a peripheral rural destination with a more dispersed settlement pattern and a larger geographical extent with a strong inflow of visitors.

6.4 SPATIAL ECONOMETRIC ANALYSIS

The preceding analysis of spatial autocorrelation has identified the five key spatial T&H employment clusters in Victoria. These employment clusters are the morphological representation of T&H employment, however the spatial processes that create or foster the agglomeration of T&H employment remains unknown. The key assumption is that the demand for T&H employment in a region is driven by the availability of tourist attractions, the greater accessibility to more efficient infrastructure supporting tourists’ mobility, the socio-demographic characteristics to enable aligning lifestyle choices with family lifecycle stages or simply the disposable income to enhance households’ capacity to consume T&H services. This section therefore examines the linkages between the spatial clustering of T&H employment and the location-specific processes with the purpose of answering this research question: “*What are the significant location-specific factors that drive T&H employment clustering in Victoria?*” This research question has been addressed by implementing a spatial econometric analytical framework.

As discussed earlier, the Moran's I computed for T&H employment was 0.59, which indicated a positive spatial autocorrelation. That is, SLAs that are close together have similar values to those that separated by greater distances. A high concentration of T&H employment at a particular area exerts a positive or negative effect on its neighbouring areas. Since there is a notable component of spatial dependence being observed, it is essential to use spatial econometric techniques to account for spatial dependence to eliminate over or under estimation of regression coefficients. The spatial econometric models are therefore developed to identify the underlying factors that drive the clustering of T&H employment in Victoria. The impacts of location-specific attributes on T&H employment clustering are specifically measured using two different modelling techniques: '*spatial error model*' (SEM) and '*spatial lag model*' (SAR). The results of these models are then compared with the outputs produced from 'Ordinary Least Square' (OLS) method.

The analysis begins with building a simple Ordinary Least Square (OLS) linear model that estimates the parameters driving the concentration of T&H employment. The presence of spatial autocorrelation in the OLS residuals was detected. The significant Moran's I ($p > 0.001$) suggests that observations are spatially correlated and are dependent on location. The assumption is that spatially adjacent observations are more likely to affect spatial interactions among neighbouring units than to those located further away (Anselin, 1988; LeSage, 1999). However, the Moran's I test does not capture whether the spatially auto-correlated residuals are driven by spatial process or an error process. Therefore, spatial lag and spatial error were modelled and we estimated and the results are compared with Ordinary Least Square (OLS) outputs. It has been suggested that the spatial process is best represented by the spatial lag model, whilst the error process is best estimated through spatial error models (Anselin, 1988). This resulted in a slight improvement in r-squared

value. For the spatial lag model, there is a distinction between the residual and the prediction error. The latter is the difference between the observed value and the predicted value that uses only independent variables rather than treating the spatial lag Wy as observed (see Chapter 4 for more details). For the spatial error, the prediction error is the difference between observed and predicted y , whereas the ‘residuals’ are the spatially filtered residuals.

6.4.1 Model specification

As discussed in Chapter 4, location-specific attributes are used as model variables to represent the contextual characteristics of geographic space. The variables and their associated dimensions used for modelling are listed in Table 5.1. The theoretical underpinnings for using these dimensions and associated variables are provided in chapter 4. These dimensions of geographic space are specifically chosen to capture the effects of location-specific attributes on employment clustering. These location-specific effects or externalities are largely related to cost advantages due to the initial resource endowment or immobile resources. For example, a positive externality may arise from the construction of a highway which opens new opportunities for tourism, housing, or commercial development. Over-congestion in popular mass-tourism destinations, on the other hand, could cause negative externality of tourism. These location-specific attributes are represented through a total of 17 explanatory variables, each of which is selected to represent five broad dimensions of geographic space, namely:

- i) Tourism attractiveness potential;
- ii) urban demographic structure;
- iii) accessibility to key amenities;
- iv) the size of local economy; and
- v) demand variables.

Spatial concentration of T&H employment is measured through location quotient which provided a dependent variable for the model. Tourism attractiveness of areas is represented through three key variables including tourism potential index, proximity to coast and open space index. Four variables, i.e. Dwelling density, median age, the percentage of working population to total population, and the index of Education and Occupation (IE&O), are included to represent the urban demographic structure of areas.

Accessibility to key amenities is measured on the road network to the international airport, nearest train station, and the Melbourne CBD. Road network density is also computed to show the length of main roads per square kilometre. Local economy is represented through gross regional product, weighted retail potential index and the size of local employment base. Weighted retail potential index (WRPI) is measured as the total count of shopping centres weighted by their sizes divided by the State's average. An index is thus generated that enables comparison of the relative positioning of an area against the average of the State. For example, the WRPI of an area with 18 shopping centres of different sizes is 1.345, which is computed as: $(LargeSC3*.6)+(MedSC7*.3)+(SmallSC8*0.1)/3.5=1.345$.

The final dimension is the demand condition, which is incorporated in the model using three variables. These include the 'index of economic resources' (IER), 'equalised net worth' and the 'median household income'. Each of these variables is described in Table 5.1. Figures 6.7 through to 6.10 show the mapped outputs of some of these variables.

Table 6.1: List of Dimensions, variables and measurements

Dimension	Variable	Measure	Data source
Dependent Variable	Tourism and hospitality employment cluster	Location quotient	ABS ANZSIC data
Independent variables			
Tourism Attractiveness Potential	Tourism potential index	Count of tourism attractions divided by the average count of tourism attractions in the state	GIS data
	Proximity to Coast	Network distance from the centroid of a SLA to the coast	GIS data
	Open space index	Proportion of open space (national and state parks) to total area in each SLA	GIS data
Urban-demographic structure	Dwelling density	Number of dwellings per square kilometre	ABS data
	Median age	The median value of age across all usual residents in the region, derived from census information on date of birth or age in years for each person	ABS data
	Working population	Proportion of working population to total population	ABS data
	Index of Education and Occupation (IE&O)	Reflect the educational and occupational level of communities. A low score indicates relatively lower education and occupation status of people in the area in general.	ABS SEIFA Indices
Accessibility to amenities	Train station	Network distance to the nearest train station	GIS data
	Road network density	Major road network length per square kilometre	GIS data
	Airport (gateway)	Network distance to the nearest major airport	GIS data
	Melbourne CBD	Network distance to Melbourne CBD	GIS data
Local Economy	Gross regional product	GRP is the measure of size or net wealth generated by the economy	ABS data
	Size of local employment base	Total employment in all industry sectors	ABS data
	Weighted Retail potential index	Total count of shopping centre weighted by their sizes divided by State average	GIS data
Demand variable	Index of Economic Resources (IER)	A relative socio-economic advantage and disadvantage, defined by variables related to income and wealth. A low score indicates a relative lack of access to economic resources in general.	ABS SEIFA Indices
	Equalised net worth (ENW)	Net worth represents the value of household assets minus the value of household liabilities, which is adjusted by average household size	ABS Survey of income and housing
	Household income	Median weekly household income	ABS data

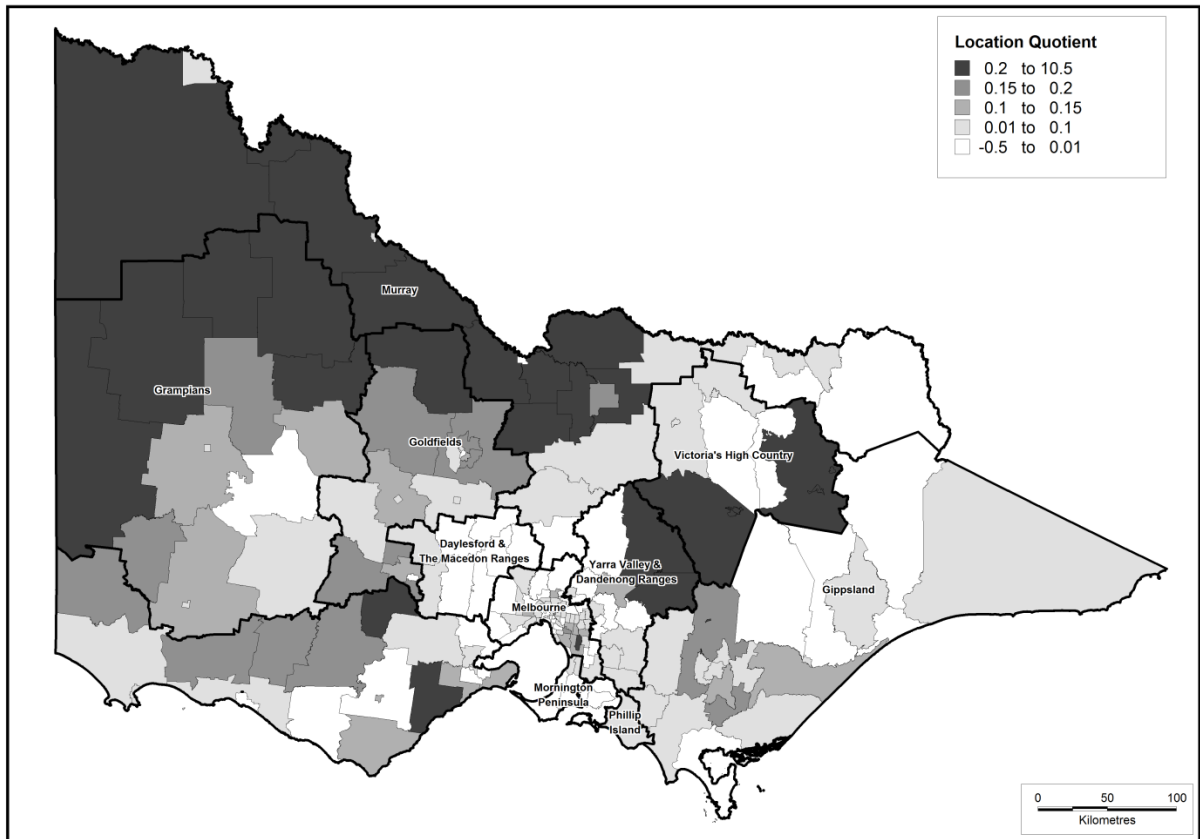


Figure 6.7 Spatial tourism and hospitality employment concentrations – location Quotient measure

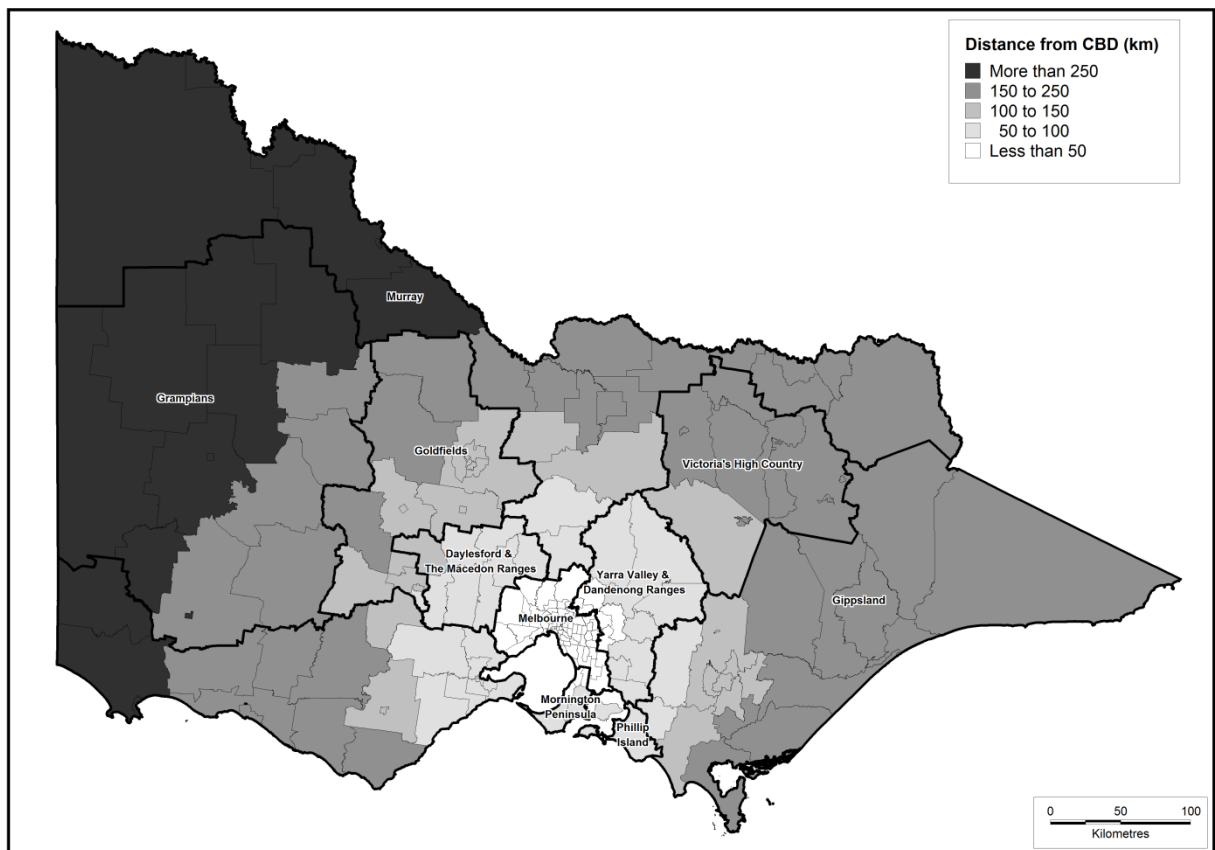


Figure 6.8: Accessibility - network distance from Melbourne CBD

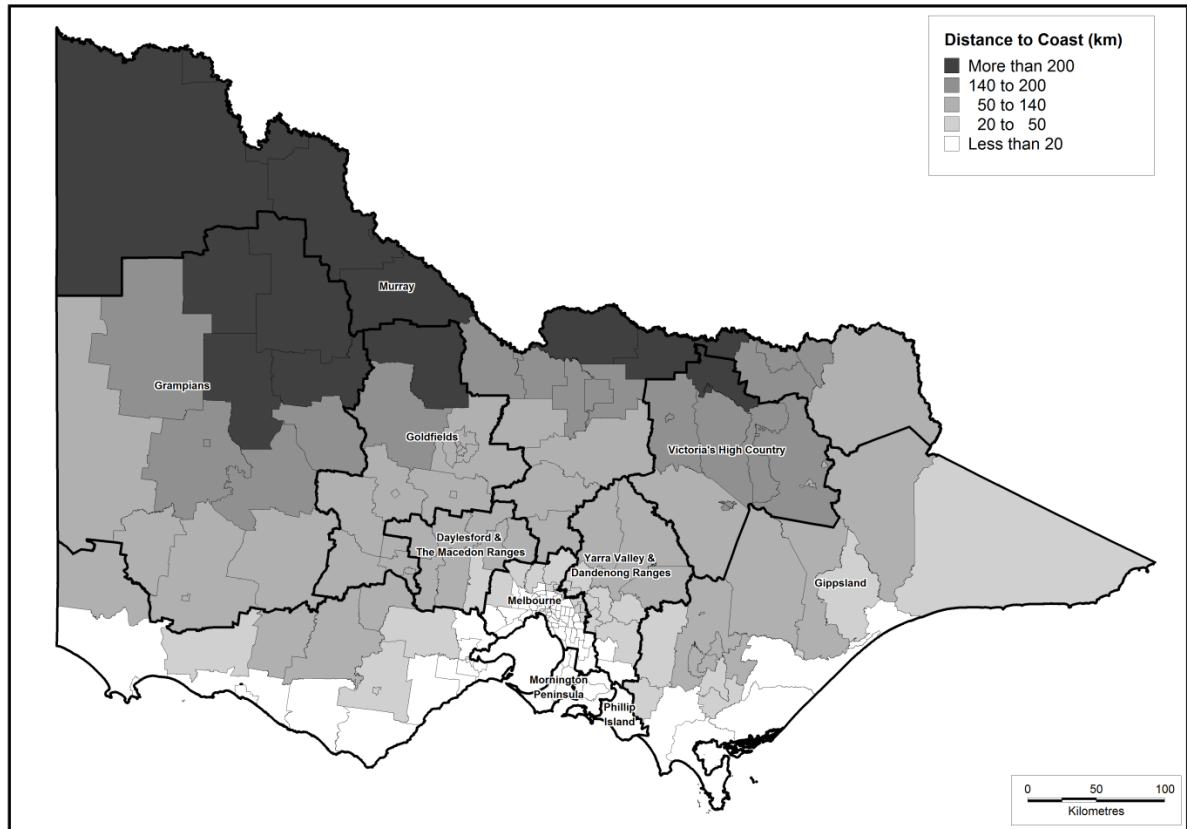


Figure 6.9: Accessibility - network distance from the coast

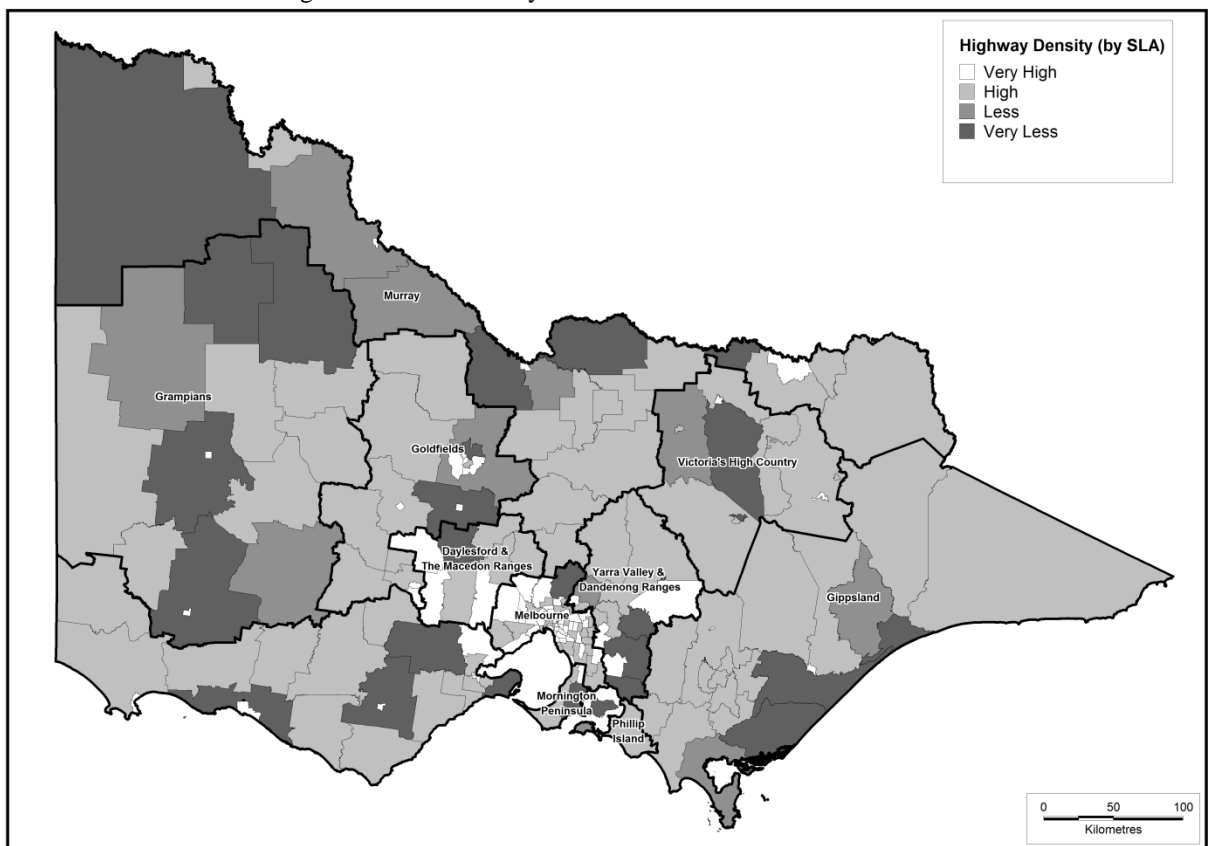


Figure 6.10: Highways network density

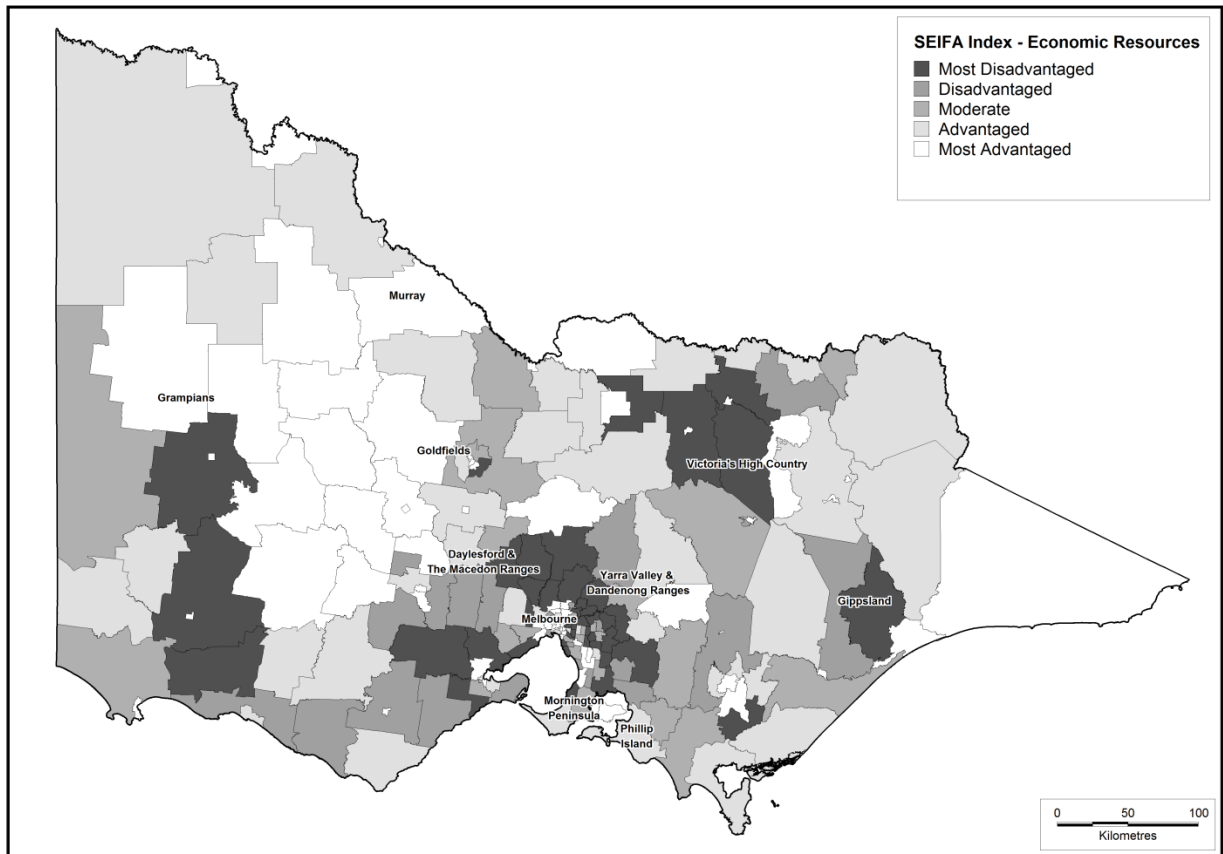


Figure 6.11: SEIFA Index of Economic Resources

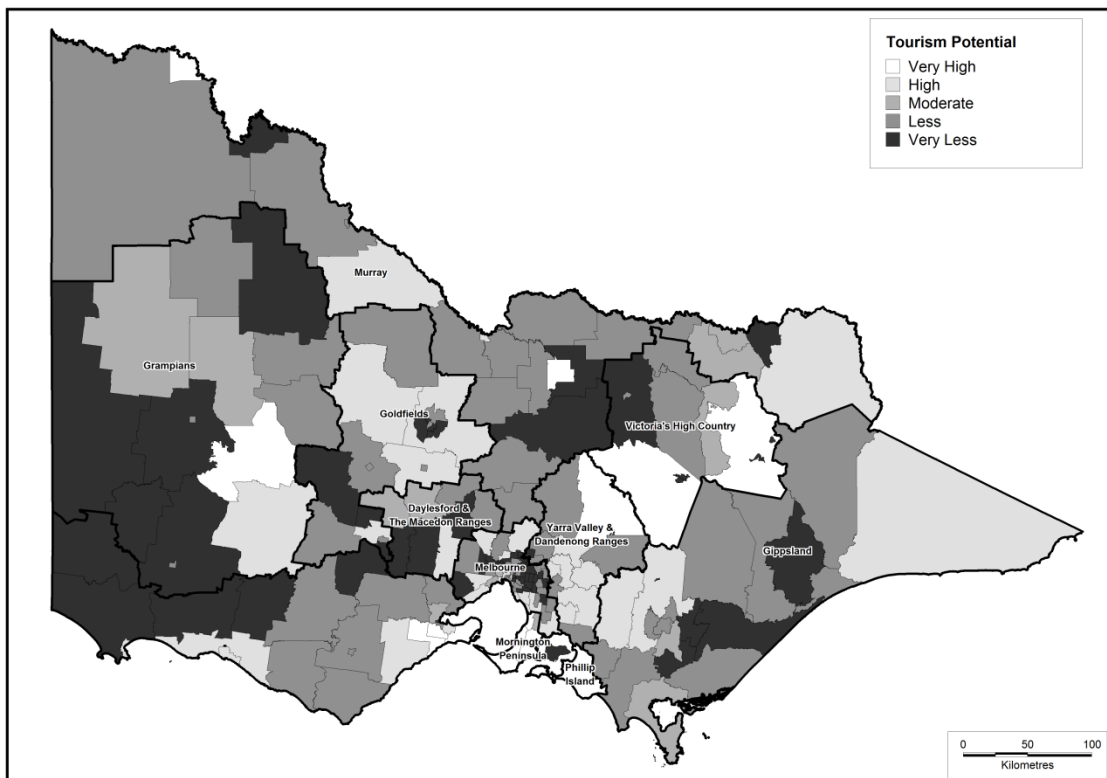


Figure 6.12: SEIFA Index of Economic Resources

6.4.2 Diagnostics

Diagnostic tests are conducted to examine the multicollinearity and heteroskedasticity problems. Data screening has been conducted to meet the assumptions required for linear modelling. Pair-wise inter-correlations between predictor variables were found to be insignificant in most cases ($p < 0.05$). Diagnostics for Spatial dependence are also performed. The test for residual spatial dependence is conducted to evaluate whether neighbouring values are more similar than they are expected to be. A number of tests based on asymptotic approaches are also conducted to test whether spatial correlation exists in the residuals. The Moran I test, Likelihood Ratio test, and Lagrange Multiplier test are executed to measure the statistical significance of spatial dependence. These tests are based on maximum likelihood estimation (Anselin, 1988).

As shown in Table 6.2, Lagrange Multiplier error (test value 12.925, p 0.0003) and lag (test value 9.53, p 0.0020) tests suggest the spatial lag model is a better fit for this dataset. The Breusch-Pagan test was found to be insignificant (0.572), thus the heteroscedasticity is not a problem. In other words, the modelling errors are uncorrelated and normally distributed and that their variances do not vary with the effects being modelled (Hair et al., 2009).

6.4.3 Estimation results

The estimates and measures of fit are listed in Table 2. The OLS model explains about 50 percent of the variability with an R Squared (R^2) of 0.49; whilst the R Square values for the SAR and SEM models are 0.55 and 0.54 respectively. The value of F test for OLS model is 19.4, which is significant (p .000). The coefficients of the model variables are also given in Table 4, where a positive coefficient of a variable means an increase in the LQ value of T&H employment with an increase in the value of that variable. The Log likelihood value declined from -461.01 for OLS to -256.89 for the SAR model that indicates the improved fit for the added variable (i.e. spatially lagged dependent variable). Similarly, the Log

likelihood test (Value 15.86, $p > 0.00006$) also confirms the significance of the spatial autoregressive coefficient, suggesting the better fit for spatial lag model.

Table 6.2: Spatial Econometric modelling results

	Ordinary least square (OLS)	Sig.	Spatial Lag Model (SAR)	Sig.	Spatial Error Model (SEM)	Sig.
Constant	1.333		1.145		1.145	
Tourism potential index	0.15	*	0.272	*	0.251	*
Proximity to Coast	-0.96	**	-1.102	**	-1.05	**
Open space index	0.025		0.043		0.75	
Dwelling density	0.014		0.017		0.004	
Median age	0.012		0.055		0.053	
Working population	0.012		0.022		0.081	
Index of Education and Occupation (IE&O)	0.091		0.033		0.056	
Accessibility to train station	-0.014		-0.001		-0.021	
Road network density	1.18	*	1.26	*	1.08	*
Accessibility to Airport (gateway)	0.083		0.026		0.04	
Accessibility to Melbourne CBD	-1.018	*	-0.912	*	-0.889	*
Gross regional product	0.251	*	0.124	**	0.142	**
Size of local employment base	0.05		0.19		0.19	
Weighted Retail potential index	0.036		0.026		0.026	
Index of Economic Resources (IER)	0.781	*	0.895	*	0.763	*
Equalised net worth (ENW)	0.026		0.022		0.029	
<i>R</i>	<i>0.49</i>		<i>0.55</i>		<i>0.54</i>	
<i>Breusch-Pagan LM</i>	<i>0.557</i>		<i>0.619</i>		<i>0.635</i>	
<i>Log Likelihood</i>	<i>-461.01</i>		<i>-256.89</i>		<i>-279.9</i>	
<i>Number of Observations</i>	<i>193</i>		<i>193</i>		<i>193</i>	

Significance level *0.05 and **0.01

Table 6.2 shows the results generated from OLS, SAR and SEM. The results are very similar in terms of coefficient magnitude, sign and significance, further highlighting the difficulties in discriminating between the two spatial models. The Log Likelihood in the spatial lag model (-256.89) is slightly better than that in the error model (-279.9). T&H employment clustering in Victoria is largely driven by five location-specific explanatory variables: the availability of tourism attractions, proximity to coast, road network density, accessibility to employment opportunities in Melbourne CBD, the scale of regional economy and the advantage/disadvantages associated with economic resources. In the

spatial lag model, *Rho* emerges as significant and positive, which suggests that there is a positive effect of T&H employment clustering on neighbouring areas. The concentration of T&H employment is therefore affected, if not controlled, by spatial processes via a ‘spillover’ effect. The computed value of *Rho* (δ) is 0.39, which suggests that if the concentration of T&H employment to nearest-neighbours of a particular area increases by 1 per cent, the concentration of T&H employment to that area will increase by 0.393 per cent through the spatial spillover effect. The *lambda* emerges as a significant and positive in the spatial error model, which suggests the existence of ‘unspecified’ spatial dependence on residuals between neighbouring areas.

There is statistically significant impact of location-specific variables of geographic space on T&H employment clustering. However, the magnitude, sign and significance of these variables vary. Proximity to the coast and availability of tourism attractions are found to be significant factors in creating a conducive environment for T&H employment clustering. However, the accessibility to parks, open spaces and water bodies has an insignificant coefficient. This indicates that greater accessibility to natural resources and amenities does not necessarily attract T&H employment. It could partly be due to land use restrictions in and around national and state parks that generally prohibit tourism development, except in some of the resort-driven Alpine areas. The Index of Education and Occupation (i.e. advantage/disadvantage associated with education and occupation) has no bearing on T&H employment clustering or the urban-demographic characteristics such as median age, working population and dwelling density.

The road network density and accessibility to Melbourne CBD have positive and significant effect on T&H employment clustering; whilst accessibility to airport and train stations have non-significant impact. The results therefore suggest that infrastructure-related variables have limited impact on T&H employment. Accessibility to Melbourne CBD however has a

significantly large but negative coefficient, which means the greater the proximity to CBD, the more concentrated T&H employment is. The mono-centric urban structure of Victoria reinforces the importance of Melbourne as a vital employment hub in producing a highly concentrated T&H employment pattern. It is interesting to note that the effect of the proximity to Melbourne CBD has emerged larger in the OLS model (-0.770) as compared to SAR (-0.474) or SEM (-0.509). The coefficient for the Gross Regional Product is also overestimated in OLS than to that estimated by spatial models; whilst for tourism potential, the coefficient is underestimated in OLS.

High income and wealth as indicated by the index of economic resources, tends to have a positive impact on T&H employment clustering. However the 'Equalised net worth', which is an adjusted estimate of net worth per household (household assets minus liabilities), has no impact on T&H employment clustering. It can be concluded that T&H employment clustering is not confined to established areas (e.g. the city centre, inner suburbs) where the dwelling density is relatively high. Furthermore, the greater accessibility to shopping centres, which contain large conglomerates of retail, recreational and entertainment employment, does not necessarily create clustering of T&H employment in relative terms.

In summary, T&H employment clusters are an outcome from the clustering of firms. However, these firms often choose strategic locations to optimise a set of objectives, for instance, to maximise accessibility to market or tourist attractions. The key strategic locations for T&H employment clustering are determined using the location-specific attributes. Five location-specific factors, which positively and significantly impact on T&H employment clustering in Victoria, are identified. These include: tourism potential index, proximity to coast, road network density, gross regional product and index of economic resources. These variables collectively explain about 55 per cent of variability in T&H employment clustering in the Spatial Lag model. The tests indicated an improved fit for the

added variable (i.e. spatially lagged dependent variable) and confirmed the significance of spatial autoregressive coefficient, suggesting the better fit for spatial lag model over Ordinary Least Square or Spatial Error Model. The contextual factors however may not directly create T&H employment clusters, but they certainly shape where and how these clusters develop and grow. The results highlighted the importance of space economy, its embedded geographic differences in tourism resource endowment, in fostering T&H employment clusters in Victoria. The five factors identified in modelling provide the key competitive advantages for areas that are resource-rich. These clusters are strategically positioned to efficiently harness these resources to compete with other regions.

6.5 SUMMARY

This chapter has identified the key spatial T&H employment clusters and determined the location-specific factors shaping the location and characteristics of T&H employment clustering in Victoria. Spatial autocorrelation techniques were used to measure and identify key spatial T&H employment clusters. Two spatial econometric models, namely spatial lag model and spatial error model, were developed to identify factors that underpin the T&H employment clustering.

The key conclusions of this chapter include:

- The T&H employment is unevenly distributed in Victoria. However, different measures generate different spatial T&H employment patterns. Density and count measures depicted more concentrated spatial patterns of T&H employment in Melbourne and other regional cities; whereas the percentage of T&H employment to total employment and location quotient measure both show more dispersed spatial patterns including areas in regional Victoria.

- T&H employment in Victoria is spatially fragmented with notable clusters being identified in areas of strategic importance particularly along the Great Ocean Road, Phillip Island and the areas around the alpine region. Moran's I of 0.59 indicates a positive spatial autocorrelation, suggesting areas that are close together have similar values than those that are further apart, attesting the validity of the Tobler's *first law of Geography*. This would also suggest the prevalence of spatial dependence or 'spill-over effect', meaning a higher concentration of T&H employment at a particular area exerts positive externalities on its neighbouring areas.
- Five distinct spatial T&H employment clusters are identified in Victoria. These clusters offer different T&H employment opportunities as well as markedly different tourism products and services. These clusters include: i) a spatial cluster along the Great Ocean Road scenic drive; ii) a spatial cluster around the Mornington Peninsula and the Philip Island (known for the Penguins colony); iii) a spatial cluster around the Alpine region; iv) a cluster associated with historical gold settlements around Ballarat and Bendigo; and v) a spatial cluster based in Melbourne CBD.
- The results from SAR and SEM have produced better estimates when comparing them with OLS. The T&H employment clusters in Victoria are largely driven by the availability of tourism attractions, proximity to the coast, road network density, accessibility to employment opportunities in Melbourne CBD, the size of regional economy and the advantage/disadvantage associated with economic resources.

The next chapter will summarise the key findings of this research. It will revisit whether the research questions were answered or not. Planning implications of these findings will also be examined along with the policy options to integrate cluster-led development in tourism management.

CHAPTER 7

SUMMARY AND CONCLUSIONS

7.1 INTRODUCTION

This chapter will present the key findings of this research and evaluate the usefulness of the spatial modelling approach applied to analyse the characteristics of spatial T&H employment clusters. It will demonstrate the potential applications of a cluster-based planning approach to assist tourism planning agencies to achieve planning objectives in Victoria. Discussion as to whether the research questions set out for this thesis were answered or not, will then follow. The chapter will also discuss the key limitations of this research. It concludes with a description of future research and the potential opportunities to extend the scope of T&H employment clustering research.

7.2 SUMMARY OF KEY FINDINGS

This research has empirically tested the cluster theory and measured the degree to which T&H industries are functionally correlated and spatially clustered across the State of Victoria in Australia. The location, size, type, and spatial patterns were first examined to reflect the spatial organisation of T&H employment at an aggregate level. It presented a new way of defining T&H employment clusters as ‘spatial constructs’. Contextual attributes of geographic space are used as surrogate measures for capturing spatial processes, which in turn impact on the degree of employment clustering. Spatial econometric modelling identified the key location-specific determinants of T&H employment clustering. In this section, the major findings of this research are as follows.

- T&H employment equates to about 7.7 percent of total employment in Australia in 2006. ‘Cafes and Restaurants’ (22%) is the largest industry employer of labour force, followed closely by ‘Takeaway Food Services’ (20%) and ‘Accommodation’ (16%).

- Significant spatial differences in T&H employment were noted. T&H employment in Victoria is spatially fragmented with employment being notably concentrated along the Great Ocean Road in the South West of the State, Phillip Island to the South of Melbourne and areas around the alpine region in the North East. A careful use of aggregate measures however is recommended, as the outputs generated from these measures vary substantially, thus their interpretation. Employment per square kilometre (density) and count measure, for example, indicate a stronger city-oriented employment pattern; whereas the percentage of T&H employment to total employment and location quotient have both identified more dispersed spatial employment patterns with clustering being observed in resort-oriented and coastal destinations.
- Higher concentrations of T&H employment in regional Victoria highlight the degree of dependency of the local economy on the T&H industry. This means that the higher the proportion of T&H employment to total employment, the greater the levels of dependency are on T&H. This could also potentially mean increased workforce vulnerability to any employment re-structuring or an industrial transformation of the local economy.
- Four broad ‘dimensions’ were identified that characterised the underlying T&H employment structure in Victoria. These include: ‘Tourism Operational Services’; ‘Hospitality Services’; ‘Entertainment Services’; and ‘Infrastructure Operational Facilities Services’. Tourism operational services, in contrast, are more widely dispersed to include significant concentrations built. The highly correlated component analysis indicates the functional interdependence of inter-related industries. The results show that the ‘tourism operational services’ are more widely distributed around popular tourism destinations in regional Victoria, whilst

‘hospitality services’ are more concentrated in Melbourne and other regional cities/towns. The Melbourne CBD has emerged as a hub for the ‘entertainment services’; however there are also other pockets in regional areas that offer such services. Employment in ‘infrastructure operational facility services’ is largely segregated around airports and transit hubs to support tourist movements. There is evidence of a high concentration of employment along the coast and a few isolated pockets particularly along the Great Ocean Road, Phillip Island and areas around the alpine regions.

- Local Indicators of Spatial Autocorrelation (LISA) has identified five distinct spatial T&H employment clusters. These include: i) a spatial cluster along the Great Ocean Road scenic drive with spectacular geomorphic coastal features; ii) a spatial cluster around the Mornington Peninsula and Phillip Island (known for the Penguin colony); iii) a spatial cluster around the Alpine region; iv) a cluster associated with historic gold mine settlements around Ballarat and Bendigo; and v) a Melbourne CBD-based spatial cluster.
- Five contextual factors of geographic space that positively and significantly impact on T&H employment clustering were identified in Victoria. These include: the tourism potential index, proximity to coast, density of road network, gross regional product and index of economic resources. These variables collectively explained about 55 percent of variability in T&H employment. The tests indicated the improved fit for the added variable (i.e. spatially lagged dependent variable) and confirmed the significance of spatial autoregressive coefficient, suggesting the better fit of the spatial lag model over OLS and SEM. The significant effect of the spatial lag variable in SAR also suggests the prevalence of a ‘spill-over effect’, meaning a

higher concentration of T&H employment in an area exerts positive externalities on its neighbouring areas.

7.3 EVALUATION

This section will specifically appraise the planning implications of key findings and outputs, discuss the limitations of the methodology applied in this thesis and revisit whether the research questions as set out in Chapter 1 were answered.

7.3.1 Planning Implications

This thesis provided new insights and advanced new knowledge in the area of T&H employment clustering from a geographic perspective. There are six broad areas where the results presented in the form of maps, employment statistics, and modelling outputs, can be useful for providing evidence-based planning strategies. These areas include:

- *Augmenting efficiency of T&H employment services networks*

Given the size of T&H employment in Australia, there is no doubt that the identified spatial clusters have the potential to act as growth centres (i.e. high capacity-high throughput nodes). Spatial T&H employment clusters therefore can be considered as the potential ‘high-volume service hubs’ to serve larger catchment areas. The cluster approach thus can be implemented as a strategy to enhance the capacity of businesses located within the T&H clusters to avail the benefits associated with better transportation services, increased volume of customer base, access to skilled labour and lower search cost. It will also facilitate inter-firm collaborations and sharing of pooled resources and common markets. The geostrategic positioning of spatial T&H employment clusters can be used to create optimal tourist circuits through design of a ‘hub-and-spoke service model’. It is suggested that the spatial T&H clusters could act as base anchors on high-volume tourist routes with transport linkages with multiple

destinations. Such network designs will encourage tourists to stay longer and enable visits to a larger geographic area. The key argument is that there is little extra needed to stimulate and promote tourism across the entire State of Victoria. That is because the benefits associated with tourism, such as better transportation services, access to skilled labour and lower search cost, can be readily available as long as the major tourist attractions are functionally integrated and physically connected with the key T&H clusters. It is envisaged that geographic dispersion of tourism-led economic growth could be supported and better coordinated through well-established spatial T&H employment clusters, which could act as a more diversified and high-volume services hubs.

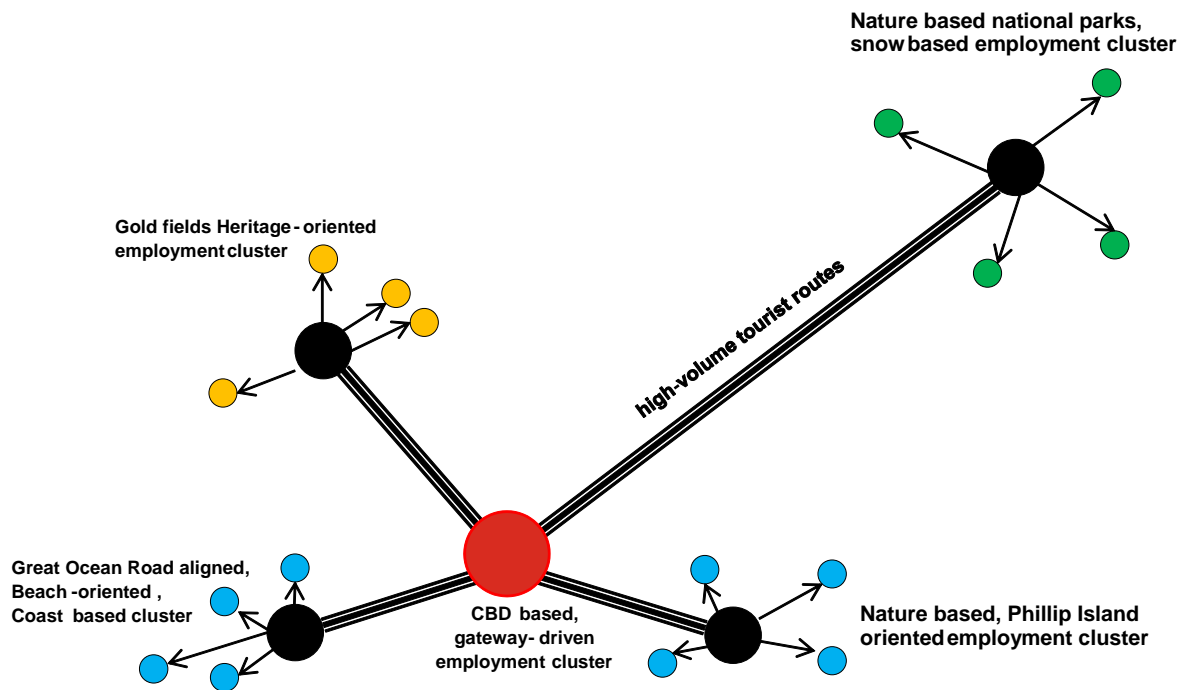


Figure 7.1: A ‘Hub-and-spoke service model’ proposed for Victoria, Australia

- *Consider investment in core strategic areas*

Spatial clustering of T&H employment suggests the need to develop and deploy destination-oriented marketing strategies to promote and consolidate tourism in key strategic areas. The built up agglomerative economies and associated benefits of co-location for firms would provide an extensive tourism infrastructure base, which is

essential to create integrated tourism services supply chains. As resources available for tourism infrastructure projects become increasingly scarce, so the need to strategise investment in high performing areas becomes crucial. This would, in turn, potentially help optimise the service delivery with finite resources.

- *Managing vulnerability of T&H- dependent local economies in regional Victoria*

It is argued that a diversified economic base is likely to be more resilient than the economy that specialises in a particular service or industry. Often the capacity of a single industry-oriented economy is constrained to sustain employment in times of economic downturn. Therefore, the areas that are heavily dependent on the T&H industry might carry a significant level of risk of over-dependence or over-reliance. To manage such risk, a workforce strategy is recommended that considers the option to increase diversity of the employment base to reduce the elevated risk of over-dependence of local economy on the T&H sector. Such a strategy is particularly critical for resort-driven tourist destinations in regional Victoria, which rely heavily on the supply of seasonal labour to sustain the current level of service to tourists visiting the region in peak sessions.

- *Better coordination of labour supply and demand for T&H services*

Mapping of T&H employment at a local area level shows spatial variability in labour supply. Similarly, the demand for T&H services, as measured by the number of visitors, also shows significant variability across different areas in Victoria. Generally, the analysis shows a positive relationship between demand and supply, meaning the higher the demand, the higher the supply of labour. This suggests that there is no indication of any market failure where employers have difficulty attracting qualified workers for jobs or workers struggle to get employment. Thus, there are no rigidities and bottlenecks noted due to a mismatch between location of labour supply and the demand for labour.

However, there are few areas where labour shortages or oversupply can be seen. Policy interventions to incentivise labour to re-locate in areas of high-demand from low demand can be formulated to reduce labour shortages or oversupply. Cluster-oriented policy would also redress the issues around labour shortages or oversupply.

- *Strategy to minimise tourism impacts through the cluster approach*

The cluster-based design of destinations in Victoria is proposed as a viable and acceptable tourism management strategy to minimise tourism impacts. Regulating the geographic spread of tourists can potentially restrict environmental and social impacts to designated areas, which have relatively higher absorptive capacity and robust infrastructure to serve high-visitor throughputs. Investment, guided by the key drivers of T&H employment such as accessibility to highways or coast, can be directed to promote tourism in strategic areas or deter tourism development in less resilient areas. Given the community resistance to unfettered tourism, the cluster-based approach could provide an alternative strategy to regulating and restricting mass-tourism in regional Victoria. However, careful planning processes need to be put in place that include community consultation and stakeholder engagement in formulating cluster-oriented tourism development policies.

- *Enhancing visitor satisfaction*

With an unprecedented growth of tourists from Asia, particularly from China and India, coupled with a gradual decline of European tourists, there is a pressing need to design and develop a new tourism marketing strategy. Such a strategy should consider encouraging Asian tourists to visit destinations in regional Victoria. The success of such a strategy however requires improve service quality by offering more diversified T&H products and services, and by providing more choices at lower rates to attract and align to the Asian market. It is generally agreed that the travelling behaviour,

consumption patterns, and choice behaviour of Asian tourists are considerably different to other market segments. This will, in turn, generate additional incomes for local economies, help increase visitations, and enhance visitor satisfaction with the destinations they visit.

7.3.2 Limitations

This thesis has developed a spatial methodology to identify key spatial T&H employment clusters and to ascertain location-specific drivers of employment clustering. There are, however, a number of limitations that need to be noted. The key limitations of this research are discussed below.

- The proposition of a T&H employment cluster as a ‘spatial construct’ or a geographic entity is theoretically problematic. Cluster, in this thesis, is therefore represented as a morphological unit. However, clusters are also functional agglomerations of interrelated and interdependent firms and institutions. The mere existence of firms at a particular locale may not always assure the creation of a functioning cluster, where collocated firms collaborate and share common services to reduce costs. A functional integration of firms, operating within the same industry, at a particular location could be considered when constructing functional T&H employment clusters. The demarcation of functional clusters could provide valuable insights into the functioning of firms, and help explain how they collectively and collaboratively add value to a product.
- From a methodological perspective, the clustering of T&H employment within an area sits outside the ambit of the spatial approach applied in this research. Clusters are geographically delineated using the principles of concentration and spatial adjacency. This measurement framework therefore excludes micro-employment clusters such as a strip of hotels, restaurants and entertainment outlets within an area.

- The use of employment as a surrogate measure to quantify the degree of concentration of firms is another limitation. The use of geocoded locations of firms is another alternative to capture the spatial distribution of industry clusters at a firm level. Aggregate data, often compiled by ABS, tends to lose detail and pose severe visualisation problems. The shape and size of census units can generate the spatial clusters that can visually be misleading, with a tendency to under or over exaggerate. For example, the size of the East Gippsland SLA to the extreme east of the state appears to be a large cluster, but in real terms, represents only a small T&H employment base.
- Spatial autocorrelation measures such as Moran's I or LISA can be highly sensitive to any change in spatial scale. This issue is often referred as Modified Area Unit Problem (MAUP), meaning a change in census boundary could potentially generate different spatial clustering patterns. Openshaw (1977, 1984) and Openshaw and Taylor (1979, 1981) suggested adopting an 'optimal' zoning system, i.e., a system that maximizes inter-zonal variation and minimizes intra-zonal variation. Alternatively, sensitivity analysis at different spatial scales can also be implemented to measure how sensitive different variables are to a change in a spatial scale and how such change impacts partitioning of space?
- The spatial econometric modelling is based on the assumption that contextual factors of a geographic space represent the agglomerative forces, which constantly cluster or disperse employment. The presence of a natural or cultural endowment, such as a tourism spectacle or cheap labour, may affect the agglomerative behaviour of T&H firms. Yet it largely remains unknown to what extent the location-specific externalities impact decisions to co-locate at a firm level. The key driver of location-specific decision-making for firms tends to be based on personal choices and

individual relationships, and opportunities for business partnerships and inter-firm collaborations. Firm-related behaviour and individual entrepreneurial aspirations also create business clusters and networks. Exclusion of firm-level organisational behaviour is therefore a major limitation, which requires further probing.

7.4 MEETING THE RESEARCH OBJECTIVES?

The overarching aim of this thesis was to quantify spatial T&H employment clusters and develop spatial econometric models to identify the location-specific factors shaping the T&H employment clustering in Victoria. To achieve this broader aim, three key interrelated research questions were developed. They were answered in different parts of this thesis.

Chapter 4 has specifically addressed the first set of research questions: *‘What industries typically represent the tourism and hospitality sector and what are its key components?’*

These two questions were answered using a range of methods. Core industries that define T&H sector employment were first identified using Victoria as a study area. Principle Component analysis was then applied to identify four key underlying dimensions of T&H employment including: ‘Tourism Operational Services’; ‘Hospitality Services’; ‘Entertainment Services’; and ‘Infrastructure Operational Facilities Services’. A simple, repeatable, interoperable and robust methodology, as discussed earlier, was developed to measure the size, location, dimensionality and characteristics of T&H employment. It is simple as it draws on ABS data, which consists of details on workforce employment by location. It is repeatable as various Census Authorities collect this information every five years that, in turn, allows the monitoring of changes in T&H employment over time and across space. Interoperable, in a sense, that it can be implemented in any jurisdiction where such data gathering by Census is administered. It is robust because the decision to include or exclude an industry into the T&H sector can be flexibly adjusted to customise the requirement of the intended purpose. The generation of down-scaled actual employment

statistics at a small area level also tackle limitations of Tourism Satellite Accounting methodology, which was often criticised for overestimating the number of jobs and for relying on tourists' spending. However, the approach provides an alternative rather than a replacement of TSA, which has now being fully recognised and established.

The next two research questions were tackled in Chapter 5. The second RQ – *'where are these tourism and hospitality-related employment cluster located'* – has been answered using global Moran's I and Local Indicators of Spatial Autocorrelation (LISA). The results of Moran's I indicated a positive spatial autocorrelation, showing the tendency for a 'spill-over effect' whereby a high concentration of T&H employment in a particular SLA exerts a positive effect on its neighbours, suggesting the spatial dependence of observations (i.e. employment LQ values). Five distinct spatial clusters of T&H employment were identified to represent T&H employment landscape in Victoria. The results validated Tobler's first law of Geography in the field of T&H, which states: – 'Everything is related to everything else, but near things are more related than distant things' (Tobler, 1970). In this research, clusters are innovatively demarcated using criteria-driven objective measures and through incorporating spill-over effect (i.e. spatial adjacency principle). The method applied in this research has eliminated the vagueness of cluster boundaries, removed subjectivity and reduced redundancy.

The third and the final Research Question – *what are the location-specific factors that drive the clustering of tourism and hospitality employment*– was addressed using spatial econometric methods. Contextual factors that stimulate or deter employment clustering were identified. The contextual factors of geographic space were either generated in GIS or obtained through other data sources and were used as input variables in statistical models.

Results from spatial econometric models were compared with the ordinary least square technique to examine the better model fit. These spatial differences in location-specific attributes have conditioned clustering of T&H employment. Spatial variability in physical, economic and institutional structures resulted in the creation of distinguishable spatial T&H employment clusters. Spatial variability in natural or cultural endowments has provided competitive advantages to areas of strategic importance; whereas for other areas the absence of these resources deterred or restricted economic opportunities. Five broad planning and policy areas were set out to explore the potential implication of the findings reported in this thesis. The scope of this research however is confined to providing an evidence base for formulating cluster-based tourism and hospitality related policies and strategies. The modus operandi of implementing these strategies is outside the ambit of this research.

Thus, the primary objective of this thesis to develop a spatial methodology for the identification of key spatial T&H employment clusters and the associated contextual factors has been fully achieved.

7.5 FUTURE RESEARCH

There are five critical areas, which would form the basis for future research on T&H employment cluster.

- First is the time-series analysis on employment data collected by ABS over the past three Census periods. This time-series data permits cluster mapping and modelling over time. Geographic evolution of various stages of cluster development can also be analysed. Employment clusters are not static; they are dynamic and they evolve through various life cycle stages. Clusters germinate, grow, mature and decline or rejuvenate over time. For instance, the diseconomies of agglomeration kick-in when cluster becomes amorphous and disproportionately large. Traffic congestion *increases*

transport costs, particularly for time-sensitive consignments. Costs of land procurement make investment in infrastructure difficult and rent to peak. As Buss (1999a, p. 368) noted: ‘clusters dissolve when costs become too high for industries to remain competitive’. Furthermore, the rigidity and resistance to change often make some clusters less competitive or even force them to fail. This point is also reinforced by Porter (2000, p. 252) when he states, ‘when a cluster share a uniform approach to competing, a sort of groupthink often reinforces old behaviors, suppresses new idea, and creates rigidities that prevent adoption of improvements’. Consequently, clusters could become less supportive to more radical innovative ideas, resist new arrivals and discard new policies. Future research therefore will specifically target conducting a time-series analysis to explore the path dependency of T&H clusters across various lifecycle stages.

- Second is to ascertain reasons why firms co-locate in a cluster and how they interact, engage and forge business partnerships with other members of the cluster. Using a survey based approach, more complex questions on the nature of collaboration and competition among firms within a geographically bounded area will be probed. For example, do firms within a cluster share transport services to reduce costs or to share the technology to increase supply chain visibility?
- Third is to integrate spatial T&H employment clusters into tourism planning. Through designing a ‘hub-and-spoke’ service model, T&H clusters can be designated as services hubs with a significant scale and scope of services; whereas spokes can be the tourist attractions within the hinterland that tourists could patronise within a day from the base hub. Through further investment in infrastructure and R&D in T&H hubs, new business opportunities can be created and

the existing capacity of tourism networks to service a larger catchment with greater agility can be enhanced.

- Fourth is the governance issue that will have to be examined. There are questions about what happens once a cluster is created: who governs, regulates and monitors its behaviour and performance. Who is accountable for stimulating and sustaining the growth of clusters? Since a cluster is an informal entity with no formal organisational structure, the management and governance of clusters poses a significant problem. For example, what procedures are put in place to manage and resolve inter-firm conflicts? Who is responsible for creating the governance structure and management plan? How to monitor firms' behaviour to avoid corporate bullying and intimidation? Is a cluster a self-organising informal entity whereby performance is assessed by cluster members, or else is government responsible for ensuring the efficient functioning of its own performance? These questions are highly contestable, and thus they form a strong basis for future investigation on policies to support cluster-oriented economic development.
- Fifth is the issue of coordination of business activities among cluster members, which is a key function of a cluster. Coordination is often less complicated in a cluster, which consists of a large corporate and its dependent suppliers. Such cluster is vertically integrated whereby the non-core functions are often outsourced to firms, which are co-located within the cluster. However, when the hierarchical structure is replaced by a more horizontal structure with several similar size firms with no single large lead firm, the coordination of cluster activities could become a challenge (Rodriguez-Clare, 2005a & b; Ridley, 2004). Ridley (2004) also reported high chance of coordination failures when upstream and downstream coordination and

transactions are coaxed. The role, functions and responsibilities of cluster therefore require further clarity within the context of cluster coordination and management.

7.6 SUMMARY

This thesis developed a simple, repeatable, interoperable and robust methodology to measure the size, location, dimensionality and characteristics of T&H employment. Four broad ‘dimensions’ were identified that characterised the underlying T&H employment structure in Victoria. These include: ‘Tourism Operational Services’; ‘Hospitality Services’; ‘Entertainment Services’; and ‘Infrastructure Operational Facilities Services’. The mapping of these dimensions show significant spatial variability in T&H employment. Infrastructure operational facility services, for instance, tend to segregate around services hubs and intermodal nodes such as airports and the main railway station.

This research introduced a new conceptual perspective on constructing a spatial T&H employment cluster. The T&H employment is conceived as a spatial construct, whereby a methodology is applied to delineate explicit formal geographical boundaries on the basis of areal homogeneity (the principle of concentration) and spatial spill-over effect (principle of spatial adjacency). The use of Local Indicators of Spatial Autocorrelation (LISA) enabled identification of five distinct T&H spatial clusters. These include: i) a spatial cluster along the Great Ocean Road scenic drive with spectacular geomorphic coastal features; ii) a spatial cluster around the Mornington Peninsula and Phillip Island; iii) a spatial cluster around the Alpine region; iv) a cluster associated with gold mine settlements around Ballarat and Bendigo; and v) a Melbourne CBD-based spatial cluster. These spatial clusters could potentially act as growth foci to create synergy and foster spill-over effects through

sharing of resources between inter-related and interdependent firms operating supply chains within the tourism sector.

Spatially fragmented patterns indicate the clustering of T&H employment in areas of resource advantage of strategic importance, which indirectly suggests the increasing returns to scale for industries that co-locate in areas consisting of similar types of industries. Building on 'localisation externalities', which are location-specific cost advantages, it established T&H clusters as non-random spatial concentrations of employment activity. The results from SAR and SEM produced better estimates than OLS. The clustering of T&H employment in Victoria is largely driven by availability of tourism attractions, proximity to coast, road network density, accessibility to opportunities in Melbourne CBD, the size of the regional economy and the advantage of economic resources. It observed the occurrence of a perpetuated polarised regional structure of T&H employment, which attests the argument that monopolistic competition and increasing returns, as opposed to constant returns-perfect competition, remained stronger and relentless. These findings also aligned with the proponents of 'New Economic Geography', who argue that economic agglomeration not only sustains, but rather accentuates clustering of employment with time.

This thesis provides new insights on managing tourism development through which strategies to integrate core-periphery can be devised. T&H employment clusters are spontaneous and organically developed spatial structures to support rapid economic growth and augment access to employment opportunity for the workforce. This is particularly significant for the tourism industry as it is considered as a mechanism for regional development with the potential to permeate tourism growth in regional and rural areas. In this research, the cluster theory is empirically examined for its applicability in the context of T&H services and now it is the time for tourism planners to transmute it into a public policy.

However, we argue that it would require adoption of tourism planning and industry-wide services chain strategies, such as brokering dialogue between firms, providing ‘subsidies’ for organisations to perform coaching roles, resourcing common training and skills upgrade and promoting international linkages, to stimulate co-operative and vibrant T&H spatial employment clusters of global significance. Through further investment in tourism infrastructure and R&D, new tourism opportunities can be created and the existing capacity of tourist destinations to service a large volume of tourists with a diversified product demand can be enhanced.

The adoption of an integrated cluster-centric spatial planning framework will allow tourism-led economic growth to be better spatially dispersed across Victoria. It is anticipated that through further investment in these employment clusters, the quality of tourism service can be improved, the tourism destinations can be better connected, the labour supply and tourism infrastructure can be better utilised and shared. The benefits associated with economies of scale and agglomeration will strengthen the competitive advantage and strategic positioning of Victoria as a leading tourist destination in the world. However, the successful implementation of clustering as a policy would require a stronger government stimulus to ignite the synergy towards creating vibrant T&H clusters of global significance.

REFERENCES

- Abdelamalki, L. C., & Courlet, C. (1996). *Les Nouvelles logiques du Developpment*. Paris: L'Harmattan.
- Agarwal, R., & Gort, M. (2002). Firm product life cycles and firm survival. *American Economic Review*, 92, 184-190.
- Anselin, L. (1995). Local indicators of spatial association – LISA. *Geographical Analysis*, 27, 93-115.
- Anselin, L., & Bera, A. (1998). *Spatial dependence in linear regression models with an introduction to spatial econometrics*. New York: Marcel Dekker.
- Antonelli, C. (1994). Technological district localized spillovers and productivity growth. The Italian evidence on technological externalities in the core regions. *International Review of Applied Economics*, 8(1), 18-30.
- Arbia, G. (2001). Modelling the geography of economic activities on a continuous space. *Papers of Regional Science*, 80.
- Arrowsmith, C., & Inbakaran, R. (2002). Estimating environmental resiliency for the Grampians National Park, Victoria, Australia: a quantitative approach. *Tourism Management*, 23(3), 295-309.
- Australian Bureau of Statistics (2013). Strong tourism growth affirms 'there's nothing like Australia'. Australian National Accounts: Tourism Satellite Account,. Latest ISSUE Released at 11:30 AM (CANBERRA TIME) 19/12/2013. 5249.0: Viewed 4th August 2013, Retrieved from

<http://www.abs.gov.au/ausstats/abs@.nsf/lookup/5249.0Media%20Release12012-13>

Australian Government (2011). What is driving Australians' travel choices? Department of Resources, Energy and Tourism Australian Government Canberra ACT: Tourism

Research Australia: viewed 15th December 2012, Retrieved from

http://www.tra.gov.au/documents/What_is_driving_Australians_travel_choices_FINAL_-_2_June.pdf

Australian Government (2013). Australian Jobs. Department of Education, Employment and Workplace Canberra.

Aydalot, P. (1986). *Milieux innovateurs en Europe*. Paris: GREMI.

Ayres, H. (2006). Education and opportunities as influences on career development: Findings from a preliminary study in eastern Australian tourism. *Journal of Hospitality, Leisure, Sport and Tourism Education*, 5(1), 16-27.

Bartik, T. J. (1985). Business location decisions in the united states: estimates of the effects of unionization, taxes and other characteristics of states. *Journal of Business and Economic Statistics*, 3(1), 4-22.

Baum, T. (2008). The Social Construction of Skill: a Hospitality Sector Perspectives. *European Journal of Vocational Training*, 44(2), 78-88.

Becattini, G. (1987). *Mercato e forze locate U destretto industriali*. Bologna: D Mulino.

Bekele, G. W., & Jackson, R. W. (2006). Theoretical perspectives on industry clusters *Research Paper*: West Virginia University, Regional Science Research Institution.

Belussi, F. (1999). Policies for the development of knowledge-intensive local production systems. *Cambridge Journal of Economic*, 23(6), 729-747.

Belussi, F. (2001). *Local production system/ industrial district as hyper-networks: A post-Marshallian interpretative Game*. Paper presented at the EAPE Conference Siena.

Belussi, F., & Arcangeli, F. (1998). A typology of networks: Flexible and revolutionary firms. *Research Policy*, 27(4), 415-428.

Bramanti, A. R., R. (1997). The multi-faced dimensions of local development. In R. B. Ratti, A Gordon, R (Ed.), *Dynamics of innovative regions: the GREMI approach* (pp. 3-45). New York: Aldershot: Ashgate. Brandenburger.

Breschi, S. F., M. (2005). *Clusters, Network and Innovation*. New York: Oxford University Press.

Brown, R. (2000). Cluster Dynamics in Theory and Practice with Application to Scotland. *European Policies Research Centre*, 1-871130-16-6, 30.

Brusco, S. (1982). The Emilian model: Productive decentralisation and social integration. *Cambridge Journal of Economic*, 6(2), 167-184.

Brusco, S. (1986). Small firms and industrial districts: The experience of Italy. In D. W. Keeble, E (Ed.), *New firms and regional development* London: Croom Helm.

Buss, T. F. (1999a). The case against targeted industry strategies. *Economic Development Quarterly*, 13(4). 3
39-356.

Business Clusters, Promoting Enterprise in Central and Eastern Europe. (2005). *The Organisation for Economic Co-operation and Development OECD Publishing* Paris.

Butler, R. W. (1980). The concept of the tourist area life-cycle of evolution: implications for management of resources. *Canadian Geographer*, 24(1), 5-12.

Canina, L., Enz, C. A., & Harrison, J. (2005). Agglomeration effects and strategic orientations: Evidence from the U.S. lodging industry. *The Academy of Management Journal*, 48(4), 565-581.

Carlton, D. W. (1983). The location and employment Choices of New Firms: an econometric model with discrete and continuous endogenous variables. *Review of Economics and Statistics*, 54.

Chhetri, P. and Arrowsmith, C. (2002), "Developing a spatial model of hiking experiences in natural landscapes," *Cartography*, Vol. 13, No. 2, , pp.87-102.

Chhetri, P., & Arrowsmith, C. (2008). GIS-based modelling of recreational potential in nature-based tourist destinations. *Tourism Geographies*, 10(2), 233-257.

Chinitz, Chhetri, P., Corcoran, J., & Hall, C. M. (2008). Modelling the patterns and drivers of tourism related employment for south-east Queensland – a spatial econometric approach. *Tourism Recreation Research*, 33(1), 25-38.

Church, A., & Frost, M. (2004). Tourism, the global city and the labour market in London. *Tourism Geographies: An International Journal of Tourism Space, Place and Environment*, 6(2), 208-228.

Clemons, E. K., Reddi, S. P., & Roe, M. C. (1993). The impact of information technology on the organization of economic activity: the 'move to the middle' hypothesis. *Journal of Management Information Systems*, 10(2), 9-35.

Coase, R. H. (1937). 'The Nature of the Firm' *Economica*, 9.

Coles, T. E., & Hall, C. M. (2008). *International business and tourism: Global issues, contemporary interactions*. London: Routledge.

Combes, P. P., & Duranton, G. (2006). Labour pooling, labour poaching, and spatial clustering. *Regional Science and Urban Economics*. Elsevier, 36(1), 1-28.

Cooke, P., & Morgan, K. (1998). *The Associated Economy*. Oxford: Oxford University Press.

Cressie, N. (1993). *Statistics for spatial data*. Hoboken, NJ: John Wiley and Sons, Inc.

Czamanski, S., & Ablas, L. A. (1979). Identification of industrial clusters and complexes : a comparison of methods and findings. *Urban Studies*, 16, 61-80.

Davis, S., & Botkin, J. (1994). The Coming of Knowledge-based Business. *Harvard Business Review* (September-October), 72(5), 165-170.

Dei Ottati, G. (1994). Trust, interlinking transactions and credit in the industrial district. *Cambridge Journal of Economics*, 18, 529-546.

Delbridge, R., & Edwards, T. (2007). Reflections On Developments In Institutional Theory: Toward A Relational Approach. *Scandinavian Journal of Management*, 23, 191-205.

Dietrich, M. (1994). *Transaction Cost Economic and Beyond: Towards a New Economic of the Firm* (1st ed.). London: Routledge.

Doeringer, P. B., & Terkla, D. G. (1995). Business strategy and cross-industry clusters. *Economic Development Quarterly*, 9, 225-237.

Dumais, G., Ellison, G., & Glaeser, E. (2002). Geographic concentration as a dynamic process. *Review of Economic Statistics*, 84(2), 193-204.

Ellison, G., & Glaeser, E. (1999). The Geographic Concentration of Industry: Does Natural Advantage Explain Agglomeration? *The American Economic Review* 89(2), 311-316.

Enright, M. J. (1991). *Geographic Concentration And Industrial Organization*. . Ann Arbor, Michigan: Harvard University.

Enright, M. J., & Kai, S. H. (2000). Survey on the characterization of regional clusters: initial results. *Institute of Economic Policy and Business Strategy : Competitiveness Program*: University of Hong Kong.

Feser, E. (1998). Old and New Theories of Industry Clusters. In M. E. Steiner (Ed.), *Clusters and Regional Specialisation On Geography, Technology and Networks* (pp. 18-40). London: Pion Limited.

Feser, E. J. & Bergman, E M. (2000). A methodology for identifying the drivers of industrial clusters: The foundation of regional competitive advantage. *Economic Development Quarterly*, 14(1), 65-96.

Florax, R. J. M., & Plane, D. A. (2004). *Fifty Years of Regional Science. Advances in Spatial Science* Germany: Springer Verlag.

Friedmann, J. (1966). *Regional Development Policy: A Case Study of Venezuela*. Cambridge: MIT Press.

Fujita, M., & Thisse, J. F. (2002). *Economics of Agglomeration: Cities, Industrial Location and Regional Growth* (1st ed.). Cambridge, UK: Press Syndicate of the University of Cambridge.

Glaeser, E., Kallal, H., Scheinkman, J., & Shleifer, A. (1992). Growth of Cities. *Journal of Political Economy*, 100, 1126-1152.

Glavan, B. (2008). Coordination Failures, Cluster Theory And Entrepreneurship: A Critical View. *Quart J Astrian Econ, Springer*, 11, 43-59.

Gordon, I. (2005). *Session 2: Labour Market Integration Policies to Enhance Social Cohesion*. Paper presented at the OECD International Conference – Sustainable Cities: Linking Competitiveness with Social Cohesion. 13-14 October 2005, Montreal.

Gordon, I. R., & McCann, P. (2000). Industrial Clusters: Complex, Agglomerations and/or Social Network? *Urban Studies*, 37, 513-532.

Green LMI, BW Research Partnership, Center for Continuing Study of the California Economy. (2011). In Managed by the NOVA Workforce Board, *Silicon Valley in Transition Economic and Workforce Implications in the Age of iPads, Android Apps, and the Social Web*: NOVA, work2future, Santa Cruz Co., San Mateo Co.

Gunn, C. A. (1997). *Vacationscape : developing tourist areas*. Taylor & Francis: Washington DC.

Gupta, V., & Subramanian, R. (2008). Seven perspectives on regional clusters and the case of Grand Rapids office furniture city. *International Business Review*, 17(4), 371-384.

Hair, J. E., Anderson, R. E., Tatham, R. L., & Black, W. C. (2009). *Multivariate Analysis*. New York, NY, USA.: Prentice Hall.

Hall, C. M. (2005a). Rural Wine and Food Tourism Cluster and Network Development. . In D. Hall, I. Kirkpatrick & M. Mitchell (Eds.), *Rural Tourism and Sustainable Business* (pp. 149-164). Clevedon: Channel View Press.

Hall, C. M., & Coles, T. (2008). Introduction: Tourism and International Business - Tourism and International Business. In T. Coles & C. M. Hall (Eds.), *International Business and Tourism. Global Issues, Contemporary interaction. International Series in Tourism, Business and Management* (pp. 1-25). London and New York: Routledge.

Hall, C. M., & Michael, E. J. (2007). *Issues in Regional Development*. Amsterdam.: Elsevier.

Hall, C. M., & Page, S. (2006). Tourism and Recreation Planning and Policy *The Geography of Tourism And Recreation: Environment, Place And Space* (3 ed., pp. 315-332). Oxon, London: Routledge.

Hall, C. M., & Page, S. (2006). Tourism and Recreation Planning and Policy *The Geography of Tourism And Recreation: Environment, Place And Space* (3 ed., pp. 315-332). Oxon, London: Routledge.

Harrington, J. (1991). *Organizational Structure and Information Technology*. Prentice: Hall.

Hefner, F. *Cluster Theory : A new Prescription for old style Government Planning*

Held, J. (1996). Clusters as an economic development tool: beyond the pitfalls. *Economic Development Quarterly*, 57, 249-261.

- Henderson, J. V. (1997). Externalities and industrial development. *Journal of Urban Economics*, 42, 449-470.
- Henderson, J. V., Kuncoro, A., & Turner, M. (1995). Industrial development in cities. *Journal of Political Economy*, 103(5), 1067-1090.
- Hofe, R. V., & Chen, K. (2006). Whither Or Not Industrial Cluster: Conclusions or Confusions? *The Industrial Geographer*, 4(1), 2-28.
- Hoover, E. M. (1937). *Location Theory and the Shoe and Leather Industries*. Cambridge, MA: Harvard University Press
- Hoover, E. M. (1948). *The Location of Economic Activity*. New York: McGraw Hill Book Co.
- Hsieh, P.-F. (2013). A note on value creation in consumption-oriented regional service clusters. *Competitiveness Review: An International Business Journal*, 22(2).
- Ioannides, D. D., K G. (1998). *Neo-fordism and flexible specialization in the ravel Industry: dissecting the polyglot*. London and New York: Routledge.
- Isard, W., Schooler, E., & Vietoricz, T. (1959). Industrial complex analysis and regional development. New York: John Wiley.
- Jackson, J., & Murphy, P. (2006). Clusters in regional tourism. An Australian case. *Annals of Tourism Research*, 33(4), 1018-1035.
- Jacobs, J. (1984). *Cities and Wealth of Nations*. UK: Penguin.
- Johansson, B., & Forslund, U. (2006). The Analysis of Location, Co-Location and Urbanisation Economies *Electronic Working Paper Series in Economics and Institutions of*

Innovation. Paper No.67 (pp. 30). Stockholm, Sweden: Royal Institution of Technology.
CESIS - Centre of Excellence for Science and Innovation Studies.

Johansson, B., & Karlsson, C. (2001). Geographic transaction costs and specialization opportunities of small and medium-sized Regions: scale economies and market extension. In B. K. Johansson, C Stough, R R (2001) (Eds.) (Ed.), *Theories of Endogenous Regional Growth- Lessons for Regional Policies* (pp. 150-180). Berlin: Springer.

Johansson, B., & Quigley, J. M. (2004). Agglomeration and Networks in Spatial Economies. *Regional Science* (Papers Reg. Sci. 83).

Johnston, R. (2003). *Clusters: A review. 'Mapping Australian science and innovation system taskforce*. Department of Education Science and Training'. The Australian Centre for Innovation Limited, Sydney. <http://tinyurl.com/25nykrj>

Junius, K. (1997). Economies of Scale: A Survey of the Empirical Literature *Kiel Working Paper No. 813* (pp. 46). 24100 Kiel, Germany: Kiel Institute of World Economics.

Klepper, S. (2002). Firm survival and the evolution of oligopoly. *Rand Journal of Economics*, 33(1), 37-61.

Kontogeorgopoulos, N. (1998). Accommodation employment patterns and opportunities. *Annals of Tourism Research*, 25(2), 314-339.

Krugman, P. (1991). Geography and Trade. In L. W. Lee, W S (Ed.), *Statistical Analysis with ArcView GIS* (pp. p. 1). Cambridge, MA: MIT Press.

Krugman, P. (1998). What's new about the new economic geography? *Oxford Review of Economic Policy*, 14(3), 7-17.

- Lade, C. (2006). Tourism factors on the murray river: success factors and barriers. *Australasian Journal of Regional Studies*, 12(3), 321-342.
- Laperche, B., Levebvre, G., & Langlet, D. (2011). Innovation strategies of industrial groups in the global crisis: Rationalization and new paths. *Technological Forecasting & Social Change*, 78.
- Latham, W. R. (1976). Needless complexity in the identification of industrial complexes. *Journal of Regional Science*, 16, 45-55.
- Legendre, P. (1993). Spatial autocorrelation: Trouble or new paradigm? *Ecology*, 74([9, 170, 532, 559, 724, 770]).
- Leiper, N. (2004). Tourism management (3rd ed). In A. Marshall (Ed.), *Principles of economics*. Macmillan: London.
- Leiper, N. (2008). Why 'the tourism industry' is misleading as generic expression. The case for the plural variation, 'tourism industries'. *Tourism Management*, 29, 237-257.
- LeSage, J. P. (1999). *Spatial Econometrics* University of Toledo (Ed.) Retrieved from <http://www.rri.wvu.edu/WebBook/LeSage/spatial/spatial.html>
- Loannides, D., Dimitri, D., & Keith, G. D. (1998). *'Neo-Fordism and flexible specialization in the travel Industry: dissecting the polyglot'*. London and New York: Routledge.
- Lowe, J., Thompson, D., & Braun, P. (2006). *A case study of clustering in regional Australia: public policies and private action*. Paper presented at the ANZRSI 30th Annual Conference 2006, Beechworth.
- Lucas, R. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22, 3-42.

Lundberg, J. (2006). Using Spatial Econometrics to Analyze Local Growth in Sweden.

Regional Studies, 40(3).

Lundmark, L. (2006). Mobility, migration and seasonal tourism employment: Evidence from Swedish mountain municipalities. *Scandinavian Journal of Hospitality and Tourism*, 6(3), 19-213.

Lundvall, B. (1992). *National system of innovation: Towards a theory of innovation and interactive learning*. London: Pinter.

Maillat, D., & Perrin, J. C. (1992). *Entreprises innovatrices et développement territorial*. Neuchatel, EDES.

Malmberg, A. M., P. (2002). The elusive concept of localization economies: Towards a knowledge- based theory of spatial clustering. *Environment and Planning*, 34(3), 420-449.

Markusen, A. (1996). Sticky Places in Slippery Space: A Typology of Industrial Districts. *Economic Geography*, 72, 293-313.

Marshall, A. (1890). *Principles of Economies* (Vol. 1). London: Macmillan.

Marshall, A. (1919). *Industry and trade*. London: Macmillan.

Marshall, A. (1920a). *Principles of Economics*. London: Macmillan.

Martin, R., & Sunley, P. (2003). Path dependence and regional evolution. *Journal of Economic Geography*, 6, 393-437.

Martin, R. S., P. (2003). Deconstructing clusters: Chaotic concept or policy panacea? *Journal of Economic Geography*, 3(1), 5-35.

Maskell, P. K., L. (2006). What qualifies as a cluster theory? DRUID working paper No. 05-09-2005 - versailles-grignon.inra.fr. In B. C. Asheim, P Martin, R (Ed.), *Clusters And Regional Development* (pp. pp. 30-49). Abingdon, Oxon: Routledge. Taylor & Francis Group.

Mavromaras, K., McGuinness, S., & Fok, Y. K. (2009). Overskilling dynamics and education pathways *Discussion Paper Series: Forschungsinstitut zur Zukunft der Arbeit Institute for the Study of Labor*.

McCann, B. T., & Folta, T. B. (2008). Location Matters: Where we have been and where we might go in agglomeration research. *Journal of Management*, 34(3), 532-565.

McCann, L., & Gunn, D. (1998). *Regional economic polity: The Canadian experience*. Toronto.

McRae-Williams, P. (2004). *Wine and Regional Tourism: strengthening complementarity to facilitate regional development*. Paper presented at the Proceedings of the New Zealand Tourism and Hospitality Research Conference, Wellington.

Michael, E. J. (2003). Tourism micro-clusters. *Tourism Economics*, 9(2), 133-145.

Motoyama, Y. (2008). What was new about the cluster theory? *Economic Development Quarterly. Saga Publication*, XX(X).

Muller, D. K. (2006). Amenity migration and tourism development in the Tärna mountains. In I. L. A. G. Moss Myrdal, G. (1957). *Economic theory and underdeveloped regions*. London: Duckworth.

Myrdal, G. (1957). *Economic theory and underdeveloped regions*. London: Duckworth.

National Tourism Policy Review of Australia. (2003). *Organisation for Economic Co-operation and Development DIRECTORATE FOR SCIENCE, TECHNOLOGY AND INDUSTRY* : Viewed in 13th September 2009 <http://www.oecd.org/australia/33649329.pdf>

Nordin, S. (2003). Tourism clustering and innovation—Paths to economic growth and development. Oestersund, Sweden: European tourism Research Institute, Mid-Sweden University.

Norval, A. J. (1936). *The tourist industry: A national and international survey*. London: Pitman.

Novelli, M., Schmitz, B., & Spencer, T. (2005). Network, Clusters and innovation in tourism: a UK experience. *Tourism Management*, 27, 1141-1152.

Ohlin, B. (1933). *Interregional and international trade*. Cambridge, Mass: Harvard University Press.

Openshaw, S. (1977). Optimal zoning systems for spatial interaction models. *Environment and Planning*, A 9.

Openshaw, S. (1984). *Concepts and techniques in modern geography*. Norwick: Geo Books.

Openshaw, S., & Taylor, P. (1979). *A million or so correlation coefficients: three experiments on the modifiable areal unit problem*. London: Routledge & Kegan Paul.

Openshaw, S. T., P. (1981). *The modifiable areal unit problem*. London: Routledge & Kegan Paul.

Overman, H. G., & Puga, D. (2009). Labour pooling as a source of agglomeration: An empirical investigation: Available at SSRN: <http://ssrn.com/abstract=1345701CEPR>

Passiante, G., & Secundo, G. (2002). From geographical innovation clusters towards virtual innovation clusters: the Innovation Virtual System *42th ERSA Congress. From Industry to Advanced Services - Perspectives of European Metropolitan Regions. Innovation and New Technologies* (pp. 22). Dortmund, Germany, 27-31 August 2002: University of Dortmund.

Pearce, J. L. (1998). *Job insecurity is important, but not for the reasons you might think : The example of contingent workers* (Vol. 5). Brisbane: John Wiley & Sons Ltd.

Pecqueur, B. (2000). *Le développement local: pour una économie des territoires* (2nd ed.). Paris: Syros Alternatives.

Perroux, F. (1950). Economic Space: theory and applications. *Quartley Journal of Economic*, 64, 89-104.

Perroux, F. (1955). Note Sur La Notion De Pole De Croissance *Economie Appliquee*, 8, 307-320.

Phelps, N. A., & Ozawa, T. (2003). Contrasts in agglomeration: proto-industrial and post-industrial forms compared. *Progress in Human Geography*, 27, 583-604.

Piboonrunroj, P., & Disney, S. M. (2009). *Tourism supply chain: A conceptual framework*. Paper presented at the PhD Networking Conference - Exploring Tourism III: Issues in PhD Research, Nottingham, UK.

Piore, M. J., & Sabel, C. (1984). *The second industrial divide: possibilities for prosperity*. New York: Basic Books

Porter, M. (1994). The role of location in competition. *Journal of the Economics of Business*, 1(1), 35-39.

Porter, M. E. (1990). *The Competitive Advantage of Nations*. New York: Free Press.

Porter, M. E. (1998). *Competitive Strategy : Techniques For Analyzing Industries And Competitors* (1st ed.). New York: The Free Press.

Porter, M. E. (2000). Location, Competition And Economic Development: Local Clusters In A Global Economy. *Economic Development Quarterly*, 14(1), 15-35.

Porter, M. E. (2003). The Economic Performance of Regions. *Regional Studies*, 37(6 & 7).

Press, K. (2006). *A life cycle for cluster. The dynamic of agglomeration, change and adaptation. Contribution to economics*. Heidelberg. New York: Physica-Verlag. . A Springer Company.

Prideaux, B. (2004). The resort development spec-trum: the case of the Gold Coast. Australia. *Tourism Geographies*, 6(1), 26-58.

Pyke, F. G., Becattini, G., & Sengenberger, W. (1990). Industrial districts and local economic regeneration. Geneva: International Institute for Labour Studies.

Rayport, J., & John, S. (1995). Exploiting the Virtual Value Chain. *Harvard Business Review*, 73, 75-85.

Ridley, M. (2004). *Evolution* (3rd ed.). Oxford: Blackwell Publishing.

Riley, M., Ladkin, A., & Szivas, E. (2002). *Tourism employment: analysis and planning*. Clevedon, UK: Channel View Publications.

Rodriguez-Clare, A. (2005a). Coordination advantage: Implications For industrial policy *Working Paper. June*: Inter-American Development Bank.

- Rodriguez-Clare, A. (2005b). Clusters and comparative advantage: Implications for industrial policy *Working Paper 523, December*: International Economic Review
- Roelandt, T., & Den Hertog, P. (1999). Cluster analysis and cluster-based policy making in OECD countries: An introduction to the theme. In OECD (Ed.), *Boosting Innovation: The Cluster Approach* (pp. 413). Paris, France: OECD
- Romer, P. M. (1986). Increasing returns and long-run growth. *Journal of Political Economy*, 94(5), 1002-1037.
- Rosenfeld, S. A. (1997). Bringing business clusters into the mainstream of economic development. *European Planning Studies*, 5(1), 3-23.
- Sabel, C. (1989). Flexible specialization and the re-emergence of regional economies. In P. Z. Hirst, J (Ed.), *Reversing industrial decline? Industrial structure and policy in Britain and her competitors* (pp. 17-70). London: Routledge.
- Schumpeter, J. A. (1934). *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle* (10th ed.). Cambridge, Mass: Harvard University Press.
- Scott, A. J. (1988). Flexible production systems and regional development: The rise of new industrial spaces in north America and Western Europe. *International Journal of Urban and Regional Research*, 12, 171-186.
- Simmie, J. (2005). Innovation and Space: A critical review of the literature. *Regional Studies*, 39, 789–804.
- Stadel, C. (1998). *Core areas and peripheral regions of Canada: Landscapes of contrast and challenge*.

Stear, L., Leiper, N., & Maior, A. S. (2005). *Conceptualising and defining tourism and related phenomena: It's not that hard if you really think about it and haven't got DUDS.*

Paper presented at the In 2005 CAUTHE Conference Proceedings, School of Tourism and Hotel Management, University of Queensland (CD), Brisbane.

State Government Victoria (2011). Victorian Multicultural Commission Population & Migration Melbourne : viewed 15th September 2011, Retrieved from

<http://www.multicultural.vic.gov.au/contact>

State Government Victoria (2011). *Census: A snapshot of our diversity.* Victorian Multicultural Commission . Melbourne: Last Updated on Tuesday, 06 May 2014. Viewed on 4th March 2014

<http://www.multicultural.vic.gov.au/population-and-migration/victorias-diversity/2011-census-a-snapshot-of-our-diversity>

Swann, G. M. P., & Prevezer, M. (1996). *A comparison of the dynamics of industrial clustering in computing and biotechnology, Research Policy* 25. Oxford: University Press.

Szivas, E., Riley, M., & Airey, D. (2003). Labour mobility into tourism. Attraction and satisfaction. *Annals of Tourism Research*, 30(1), 64-76.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using Multivariate Statistics (4th ed.)*. New York: Harper Collins.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics (5th ed.)*. Allyn & Bacon: Boston, MA.

Tapper, R., & Font, X. (2004). Tourism supply chains- A report from Leedsmet for the travel foundation *Report of a Desk Research Project for The Travel Foundation*. Leeds: Leeds Metropolitan University. Environment Business & Development Group.

Tapscott, D., Ticoll, D., & Lowy, A. (2000). *Digital Capital: Harnessing the power of business webs*. London.

Thisse, J. F. (2011). *Geographical Economics : A Historical Perspective*.

The economic importance of tourism in Australia's regions. (2012-13). Tourism Research Australia. Department of Resources, Energy and Tourism. Australia Tourism Research Australia. Australian Government Canberra : Viewed 15th July 2014, Retrieved from http://corporate.snowymountains.com.au/wp-content/files/The_Economic_Importance_of_Tourism_in_Australias_Regions_FINAL.pdf.

Tobler, W. R. (1970). A computer movie simulating urban growth in the Detroit region. *Economic Geography*, 46(2). 234-240.

Tourism Satellite Account. (2006). The Australian Bureau of Statistics Canberra: Viewed 2nd July 2013, Retrieved from <http://www.censusdata.abs.gov.au/ABSNavigation/prenav/PopularAreas?collection=census/period=2006>.

Tourism Victoria (2009-2012). Regional tourism action plan Melbourne: Viewed on 16th Jan 2010 Retrieved <http://www.tourism.vic.gov.au/images/stories/Documents/StrategiesandPlans/regional-tourism-action-plan-2009-2012-version2.pdf>.

Tourism Satellite Account. (2010-11). Australian Bureau of Statistics Canberra. Released at 11:30 AM (CANBERRA TIME) 21/12/2011, last updated 24 April 2013, Retrieved from <http://www.abs.gov.au/ausstats/abs@.nsf/ProductsbyReleaseDate/4CAA392893D4EA0BCA257B570014E8E5?OpenDocument>

Tourism Victoria (2011). International Visitation Estimates to Victoria by Origin Year ending September 2000-2011. Melbourne: Viewed on 16th April 2013, Retrieved from <http://webcache.googleusercontent.com/search?q=cache:A4aItNzRKYJ:www.tourism.vic.gov.au/images/stories/international-visitation-to-victoria-by-origin-ye-September-20112.pdf+&cd=1&hl=en&ct=clnk&gl=au>.

Tourism Satellite Account. (2011-12). The Australian Bureau of Statistics Canberra: Viewed on 16th March 2012 Retrieved from <http://www.censusdata.abs.gov.au/ABSNavigation/prenav/PopularAreas?collection=census/period=2006>

Tourism Satellite Account. (2013). The Australian Bureau of Statistics Canberra: Viewed on 16th Jan 2013, Retrieved from <http://www.censusdata.abs.gov.au/ABSNavigation/prenav/PopularAreas?collection=census/period=2006>.

Tourism Victoria. (2013). State Government Victoria Melbourne: Viewed on 16th April 2013, Last Updated 18th October 2012, Retrieved from <http://www.tourism.vic.gov.au/18-research/218-facts-and-figures.html>

Tourism Research Australian. (2014). Australia's economy benefits from a 4.3% rise in tourism's total contribution Government. Austrade. Media release dated 30th April 2014. Canberra: Viewed on 2nd July April 2014, Retrieved from

http://www.tra.gov.au/documents/media-releases/TRA_TC_Media_Release_FINAL_300414.pdf

Turner, R., & Sears, Z. (2013). Travel & Tourism as a driver of employment growth *The Travel & Tourism Competitiveness Report* © 2013 World Economic Forum.

Webers, A. (1929). *Theory of the Location of Industries* (Friedrich, Trans.). Chicago: University of Chicago Press.

Wilkinson, J. (2006). *Tourism in NSW: Prospects for the current decade*. NSW Parliamentary Library Research Service.

World Tourism Organization Tourism Trends and Marketing Strategies UNWTO. (2013) *Tourism Trends and Marketing Strategies UNWTO Facts & Figures edition page.* : Viewed on 10th July 2014, Retrieved from <http://www.unwto.org/facts/menu.html>

Yang, Y., & Wong, K. (2013). Spatial distribution of tourist flows to China's cities. *Tourism Geographies*, 15(2), 338-363.

Yang, Z., & Fung, K. (2009). Macao's economy in the financial crisis *EAI Background Brief No. 456. Date of Publication: 5 June 2009*. Macao.

Zhang, C. H., & Zhang, S. (2011). Condence intervals for low-dimensional parameters with high-dimensional data. *arXiv:1110.2563v1*.

