Spring 2015

Modeling the impacts of hospitality and tourism enterprises on community quality of life

Sangchoul Yi

Graduate School Form 30
Updated 1/15/2015

PURDUE UNIVERSITY
GRADUATE SCHOOL
Thesis/Dissertation Acceptance

This is to certify that the thesis/dissertation prepared

By Sangchoul Yi

Entitled
MODELING THE IMPACTS OF HOSPITALITY AND TOURISM ENTERPRISES ON COMMUNITY QUALITY OF LIFE

For the degree of Doctor of Philosophy

Is approved by the final examining committee:

Liping A. Cai
Co-chair

Jonathon Day
Co-chair

Sandra Sydnor

Annmarie Nicely

To the best of my knowledge and as understood by the student in the Thesis/Dissertation Agreement, Publication Delay, and Certification Disclaimer (Graduate School Form 32), this thesis/dissertation adheres to the provisions of Purdue University's "Policy of Integrity in Research" and the use of copyright material.

Approved by Major Professor(s): Jonathon Day

Approved by: Richard Ghiselli 4/23/2015
Head of the Departmental Graduate Program Date

MODELING THE IMPACTS OF HOSPITALITY AND TOURISM ENTERPRISES ON COMMUNITY QUALITY OF LIFE

A Dissertation

Submitted to the Faculty

of

Purdue University

by

Sangchoul Yi

In Partial Fulfillment of the

Requirements for the Degree

of

Doctor of Philosophy

May 2015

Purdue University

West Lafayette, Indiana

ACKNOWLEDGEMENTS

I am so grateful to all the people who have helped me with the completion of this dissertation. Firstly, I would like to thank my advisors and mentors, Dr. Liping A. Cai and Dr. Jonathon Day. They are a lighthouse in my voyage. Their guidance and advice were an integral part of my program. I would also like to thank my committee members: Dr. Sandra Sydnor for her great insight on macro-level analysis and comments on my work and Dr. Annmarie Nicely for her helpful feedback that enriched my understanding of true phenomena in the tourism industry. I am very lucky that I can have them as my committee members.

I would like to express my gratitude to my parents, Dalhwan Yi and Jungsuk Kim, for their love and support. Also, I wish to thank my parents-in-law, Gisung Yoo and Youngsoon Yi, and my family members: Shinjung, Jaehung, Sungsuk, and Siwook as well as the rest of my family for their love and support. Especially, I wish to thank my wife, Sungja Yoo, and my children, Christopher, Daniel, and Faith. They are one of my reasons that I can finish this dissertation. Finally, I would like to dedicate this dissertation to my Lord and Savior, Jesus Christ.

TABLE OF CONTENTS

Page

Page

LIST OF TABLES

Table Page

LIST OF FIGURES

ABSTRACT

Sangchoul Yi, Ph.D., Purdue University, May 2015. Modeling the Impacts of the Hospitality and Tourism Enterprises on Community Quality of Life. Major Professors: Liping A. Cai and Jonathon Day.

The present research examined the impacts of hospitality and tourism businesses on community quality of life using existing public domain databases. In the tourism literature, various methodological approaches have been proposed to investigate the impacts of tourism on a host community and its residents. However, these approaches are limited because of innate methodological constraints such as the bias of the survey respondents' perceptions. To overcome such a limitation, alternative research constructs have been proposed. Among them, Quality of Life (QOL) has become a good alternative for measuring tourism impacts. Accordingly, the present researcher introduced QOL as a research tool for analyzing tourism impacts at the community level.

Based on tourism impact theories and quality of life theories, the present researcher conceptualized a tourism-related QOL, constructing QOL indices and analyzing the impacts of hospitality and tourism on community quality of life. To construct QOL indices, ten objective and perception-based QOL indicators were utilized. After conducting a Principal Component Analysis (PCA) on QOL indicators, five QOL domains were identified: material QOL, social QOL1 (i.e. overall social QOL), social QOL2 (i.e. subjective social QOL), social QOL3 (i.e. safety-related QOL), and environmental QOL domain.

To estimate a tourism impact model, 775 American counties were selected as sample counties, and five statistical models were proposed. According to model diagnostic test results, it turned out that the Seemingly Unrelated Regression Model (SURE) with Maximum Likelihood estimation (ML) is the most suitable estimation method because it overcomes the common obstacles of simultaneous estimation models.

The results of the SURE model indicated that the sub-domains of community QOL are interrelated, showing that such interrelationships should be considered when the parameters are estimated. The major findings are as follows: 1) the hospitality and tourism industry positively affects material QOL, 2) overall social QOL is positively affected by the hospitality and tourism industry, 3) the hospitality and tourism industry does not affect subjective social QOL, 4) the hospitality and tourism industry affects safety-related QOL in mixed ways, 5) the tourism industry positively affects environmental QOL, 6) natural factors are a significant determinant of environmental QOL, and 7) community characteristics affect community QOL.

Research results suggest crucial implications for rural and coastal communities. For example, rural communities have suffered from a low level of community QOL. However, tourism can improve material and social QOL, alleviating such a disadvantage for rural areas and implying that the tourism industry could be a strategic industry for rural areas to improve community QOL. Practically, the present research demonstrated how to simulate tourism impacts using estimation results of the research model. In simulation, three different scenarios of tourism development were used, clarifying that rural counties in coastal and non-coastal areas can benefit from tourism development. Especially, when policy makers and tourism practitioners want to know expected consequences of tourism development on their communities, simulation results would provide straightforward information about tourism impacts.

The present research contributed to tourism academia and local communities in three ways. Theoretically, the present research reconciled tourism impact theory and QOL theory in a community QOL framework. It suggested a new way to examine tourism impacts on local communities. Previous research investigated tourism-related QOL from the QOL research framework, attempting to analyze tourism phenomena using QOL theories. However, the present research proposed that it is easier to understand tourism phenomena after reconciling tourism and QOL theories. Methodologically, the present research demonstrated how to build community-level QOL indices in a systematic way using public domains data sets. The researcher also showed how to use an equation system for estimating multidimensional impacts of tourism on community QOL domains. Such an approach is an innovative way to investigate tourism impacts on local communities; the present research is the first to consider multidimensional aspects simultaneously and to reconcile objective and subjective indicators of QOL research at the community level. Practically, one of the research outputs is a community-level QOL database. It should be helpful when policy makers and community leaders consider tourism as a community economic development tool and evaluate tourism impacts on their communities. The database is also a basis for simulation of QOL changes by tourism development, providing information about potential consequences of tourism development. This is one of the main contributions of the present research.

CHAPTER 1. INTRODUCTION

The present study probes the impacts of the hospitality and tourism industry on community quality of life. By combining social utility theory and modern quality of life theories, the main objective of the study is to propose an empirical model to estimate the impacts of the hospitality and tourism industry on community quality of life. The proposed model will help local community leaders, legislators, and industry practitioners by providing a practical model concerning the impacts of the hospitality and tourism industry.

As a service-based industry, tourism affects local communities in various ways. It has been considered as an important engine for the economic development of local communities because of its job and revenue creation potential. According to the Bureau of Labor Statistics (BLS), the hospitality and tourism industry in the United States (U.S.) provided 13 million jobs in 2010. The employment accounted for 9.1% of total employment in 2010 in the U.S., becoming one of America's largest private sectors of job providers and tax revenue generators (Henderson, 2012).

With such an economic impact, the hospitality and tourism industry has fascinated local community leaders, policy makers, and scholars. However, such benefits come with a price. Reportedly, tourism development brings various impacts to local communities, resulting in positive and negative social and environmental consequences (Song, Dwyer, Li, & Cao, 2012). This is because the industry accompanies human's activities in society, inevitably mobilizing people and consuming resources. Therefore, the significance of tourism research on the consequences cannot be overstated because successful tourism development depends on how well local communities manage positive and negative impacts of tourism.

With respect to research concerning tourism impacts, it has been difficult to measure and analyze impacts of the hospitality and tourism industry because some of them are indirect and intangible. Initially, scholars paid attention to the positive economic impacts of the hospitality and tourism industry because generating such economic impacts has been one of the most important reasons for tourism development. Moreover, quantitative economic data is available to tourism scholars, allowing them to investigate positive economic impacts. However, the scope of the tourism impact research expanded into social, cultural, and environmental realms. Such realms are vulnerable to negative tourism impacts; careful management is needed. Compared to tourism economic impacts, it is more difficult to manage tourism social and environmental impacts because they are potentially less quantifiable. Such features have been an obstacle to tourism impact research. To overcome the obstacle, various research approaches have been proposed. Among them, perception-oriented tourism social impact research has been a core of tourism impact studies because it covers the direct and indirect impacts of tourism on society.

The measurement issue of tourism social impacts is a traditional limitation of tourism social research. To deal with such an issue, it has been suggested to measure residents' perceptions and attitudes for tourism development. This approach theoretically originated from social exchange theory, and tourism researchers tested robustness of such an approach in tourism impact studies (Ap, 1992; Sharpley, 2014). However, this approach still has some limitations. The most notable limitation is that residents' perceptions or attitudes could be affected by various individual level factors such as the extent of economic dependency on the tourism industry, socioeconomic variables, and spatial factors (Deery, Jago, & Fredline, 2012; Sharpley, 2014). To overcome the limitation, alternative research constructs have been proposed. Among them, community or residents' quality of life has become a good alternative for measuring tourism impacts.

1.1 Quality of life as a ultimate goal of modern societies

Since the 1990s some pioneering works have introduced a Quality of Life (QOL) framework in tourism impact research. This is because improving QOL of local residents is one of the most important policy goals of tourism development (Andereck, Valentine, Vogt, & Knopf, 2007; Dwyer & Kim, 2003; Lordkipanidze, Brezet, & Backman, 2005; Malecki, 2004). The fundamental idea of QOL in tourism research is that tourism development aims at improving living conditions of local communities; it changes the social, cultural, economic, and industrial structure of society, influencing residents' perceptions of their life. Such an idea has provided a concrete research framework and theoretical foundation to analyze the impacts of tourism on local communities by examining residents' perceptions of QOL.

Originally, the QOL framework indicated its practical applicability in other social science areas. Indeed, QOL is one of the fundamental topics for a philosophical discussion because society and individuals' primary goal is to pursue a good quality of life or happiness. From ancient Greek to modern times, philosophers discussed fundamental questions of quality of life. The typical questions are "What is true happiness?", "What is the true value of quality of life?", and "How does one live, live well, and live better?". Such kinds of discussions continue in contemporary social sciences. For example, in sociology, American social scientists have discussed QOL since the 1960s, conducting the social indicator movement to improve social happiness through providing precise information about QOL (Michalos, 2004). Here social indicators mean a social statistic that reflects the current status of society. However, the movement declined in the 1980s because of several theoretical and methodological issues (Cobb & Rixford, 1998). By the end of the 1980s, several European nations (e.g. Great Britain, France, and Germany) and international agencies like Organization for Economic Cooperation and Development (OECD) and World Health Organization (WHO) created a focal place of QOL research by representing themselves as the main players of QOL studies, promoting international QOL research.

Yet, economists have developed a systematic method to measure and maximize human happiness, which is called utility in economics. Specifically, social utility theory is in line with the core idea of QOL in terms of its theoretical foundation, leading the establishment of welfare economics: the study of how the allocation of economic resources affects human happiness or well-being (Gans, King, Stonecash, & Mankiw, 2011). Social utility theory has become the key foundation for objective QOL research.

Objective QOL research is one of the two mainstreams of QOL research. Another mainstream is subjective QOL research. In tourism impact research, both approaches have been utilized in terms of the objectives of research and units of analysis. Each approach has own strengths and weaknesses. For example, subjective QOL research could examine multi-dimensional aspects of tourism impacts on individual quality of life, but some researchers have criticized that it is difficult to generalize findings of existing studies that rely mainly on the survey data in a single destination or several neighboring areas (Meng, Li, & Uysal, 2010).

On the contrary, some supporters of subjective QOL research argue that there are weak links between objective living conditions and perceptions of personal happiness as well as quality of life is a multi-dimensional concept with economic, social, and environmental domains (McCabe & Johnson, 2013). Therefore, current objective QOL research could not fully reflect real human happiness. In the present study, the researcher attempts to combine both subjective and object QOL research methods into a hybrid QOL research method to overcome the methodological and theoretical limitations of existing approaches to better understanding of the impacts of the hospitality and tourism industry on community QOL.

1.2 Significance of the current research

The significance of tourism-related QOL research can not be overstated. It is important for community leaders, legislators, and tourism practitioners to understand how the hospitality and tourism industry affects community quality of life; improving QOL is a ultimate goal of tourism development. Even though the topic of QOL remains a relatively new concept in tourism research, some scholars have attempted to use the QOL framework to analyze impacts of tourism on local communities and residents. However, such attempts are focusing on one approach of QOL research – a subjective QOL approach. As mentioned in Chapter 1.1, unique limitations of the subjective QOL approach remain in tourism-related QOL research. Therefore, there is a need for an advanced research approach to overcome research limitations. Unfortunately, little research has attempted to resolve such limitations in tourism QOL research. Specifically, existing tourism QOL studies could barely escape from a methodological weakness of subjective QOL approach. One of the possible reasons for the issue is that it is difficult for tourism researchers to access community-level

QOL information. Another reason is that it has been underdeveloped how to analyze such a community-level QOL database.

To fill such a gap, researchers have tried to build a community-level QOL database by connecting various QOL information from American federal agencies as well as to analyze the impacts of the hospitality and tourism industry on community QOL. Specifically, the present research resolved three key issues. First, it proposed how to build a community level QOL database. Although many American agencies conduct QOL-related research at the community level and provide information, such information is scattered and less usable in academic research. Therefore, the present research demonstrated how to put various QOL information into the community-level QOL database. Second, the current research suggested how to construct tourism-related QOL indices. Concretely, the researcher incorporated tourism impact theories into the tourism-related QOL framework, providing QOL indices from a tourism research perspective. Finally, the researcher developed empirical models to estimate the impacts of the hospitality and tourism industry on the community level QOL, comparing research models to acquire a suitable analytical method. It is expected that research results should contribute to tourism-related QOL theory development and practical application of tourism development for improving community QOL through identification of a specific mechanism of tourism-related QOL.

1.3 Research purpose and objectives

Given that improving community and residents' quality of life is the first priority of policy makers and community leaders, hospitality and tourism scholars have long paid attention to the impacts of the hospitality and tourism industry on community quality of life.

However, tourism-related QOL is one of the ill-defined concepts in tourism research: it is a broad concept interpreted differently. Little understanding of tourism-related QOL from empirical research prevents tourism researchers from utilizing a QOL framework in tourism impact research. Therefore, to harness tourism development as a tool for improving community and residents' QOL, tourism scholars need to redefine a QOL concept from a new perspective in hospitality and tourism research, discovering a mechanism that the hospitality and tourism industry affects community and residents' QOL. The purpose of the present research is to perform such tasks by 1) exploring a theoretical foundation of tourism-related QOL, 2) building tourism-related QOL indices at the community level, and 3) investigating the impacts of the hospitality and tourism industry on community QOL using advanced research models.

Consequently, more specific objectives of the present research are as follows: 1) To review existing literature about tourism impacts on QOL, synthesizing new findings of hospitality and tourism-related QOL; 2) To propose a theoretical foundation about the impacts of the hospitality and tourism industry on hospitality and tourism-related QOL; 3) To identify potential data sources for hospitality and tourism-related QOL research; 4) To develop a community/county-level data integration method for examining social, economic, and environmental issues of tourism impacts; 5) To build a community-level QOL database of American counties by performing data integration with public domain datasets; 6) To construct QOL indices at the county-level by conducting a multivariate analysis method like Principal Component Analysis; 7) To develop an empirical research model for investigating the impacts of the hospitality and tourism industry on community QOL; 8) To empirically test the relationships among key QOL domains; 9) To estimate the impacts of the hospitality and tourism industry on community QOL; and 10) To determine the best estimation method by comparing results of various estimation models.

1.4 Organization of the current research

The present research proceeds as follows. Chapter Two presents a review of the relevant literature, emphasizing three areas: 1) a theoretical foundation of tourism impacts on local community, 2) tourism impacts, and 3) quality of life theory development. In the chapter, research model and hypotheses are presented. Chapter Three describes the data, variables, samples, statistical tools, empirical research models, and specific data analysis procedure. Chapter Four shows the descriptive statistics, statistical test results, and key information for determining the best estimation model in the present study. Chapter Five discusses research results, policy/managerial implications, and its limitations, and suggests future research directions.

CHAPTER 2. LITERATURE REVIEW

The present chapter reviews the theoretical foundation (i.e. social utility theory and social exchange theory) of the current research, relevant literature of tourism impact research, and theories of tourism-related quality of life. With a reconciliation of two research mainstreams - tourism impact research and tourism-related quality of life - a conceptual research model is proposed at the end of the chapter.

2.1 Theoretical foundation

2.1.1 Social utility theory

Quality of Life (QOL), subjective well-being (i.e. life satisfaction), and human happiness have been interchangeably used in social science literature. Given that the nature of human happiness resides in life satisfaction, social utility theory – a classic economic theory of welfare economics - can provide the theoretical foundation of tourism-related QOL research. Conceptually, satisfaction is comparable to a concept of utility in economics (Diener, Lucas, Schimmack, & Helliwell, 2009). If another name of life satisfaction is QOL, a QOL researcher can apply social utility theory to the QOL research framework. According to microeconomics theory, consumers get their satisfaction from their consumption experience, coming from product bundle consumption. Traditionally, economists have focused on the issues of utility maximization: how to maximize consumers' satisfaction at the given budget constrain. This is a major theme of conventional economic theories.

Regarding the issues, welfare economists have expanded the boundary of economics into various social issues, suggesting how to maximize social utility using proper resource allocation.

At the core of welfare economics, social utility theory plays an important role in deciding the optimal level of resource allocation. At the same time, the theory could provide the theoretical foundation of QOL because the basic idea of the theory can explain the relationship between community QOL and the availability of products, services, and resources of a community. Specifically, utility theory begins with a social utility function, which can be algebraically specified as a function of the amount of products, services, and resources held. That means community's satisfaction depends on the availability of all that communities and residents need. For the present research, there is the assumption that the hospitality and tourism industry is a source of the products, services, and resources that a community needs, expressed as follows:

$$U_i = U(c_{i1}, \ldots, c_{im}) \qquad (2\text{-}1)$$

where U_i = utility of community i

c_{ij} = amount of products, services, and resources j held by community i

In social utility theory, utility increases as the amount of the product or service held increases, imposing a restriction on the first derivative of U_i with respect to c_{ij}:

$$\frac{\partial U_i}{\partial c_{ij}} > 0, \quad j = 1, \ldots \ldots m \qquad (2\text{-}2)$$

The assumption of declining marginal utility also imposes another restriction on the second derivative of U_i with respect to c_{ij}:

$$\frac{\partial^2 U_i}{\partial c_{ij}^2} < 0, \quad j = 1, \ldots \ldots \mathrm{m} \tag{2-3}$$

In microeconomics, many utility functions satisfy such assumptions. Among utility functions, the present researcher utilized a generalized form of Cobb-Douglas utility function because the function can be easily transformed into a linear form (Coleman & Coleman, 1994). The generalized form of Cobb-Douglas utility function is presented as follows:

$$U_i = c_{i1}^{x_{i1}} c_{i2}^{x_{i2}} \ldots \ldots c_{im}^{x_{im}} \tag{2-4}$$

The utility function can be transformed into a linear form by taking a log transformation.

$$U_i = x_{i1}c_{i1} + x_{i2}c_{i2} \ldots \ldots + x_{im}c_{im} \tag{2-5}$$

where x_{ij} are parameters, indicating the influence of consumption of goods and services j on the utility of community i. As shown in Equation (2-5), the level of community satisfaction or QOL is determined by the availability of products, services, and resources in a community. More available resources could lead to a higher level of satisfaction of a community.

However, social utility theory cannot explain all sorts of tourism impacts on community QOL as it is difficult to quantify some social and environmental impacts. Such difficulty prevents tourism researchers to process tourism social and environmental impacts in the social utility framework. To consider such impacts in social utility theory, a supplementary theory is needed. One of the supplementary theories is social exchange theory.

2.1.2 Social exchange theory

Even though social utility theory can explain the influence of the hospitality and tourism industry on society, a fundamental question remains. How does society determine an optimal level of product production and service provision? One can find an answer to the question from social exchange theory. Social exchange theory is a general sociological theory, which can be applied to the exchange of tourism resources, travel experiences, and social interactions between tourism stakeholders (e.g. host community residents, tourists, community leaders, and tourism developers). Social exchange theory is rooted in economics, social psychology, and sociology. The theory explains a process of a negotiated exchange between stakeholders in social and economic activities. From the economic perspective, most transactions are executed in a market mechanism with price as the most important determinant for exchanges. However, social exchange theory posits that such an exchange is based on perceived benefits and outcomes from social interactions as well as economic interests between stakeholders. If a party of stakeholders perceives that the cost of exchanges exceeds benefits, then the party's attitude to social interactions will be negative, leading to hesitation to engage in social interaction. If both parties perceive that benefits exceed cost, the parties' attitude to social interactions will be positive, thus supporting social interactions between stakeholders. Such a theory can be applied to the optimization of tourism product production and service provision as well as tourism development.

Theoretically, exchanging products, services, and information is a basic function of a market. Much academic research has been devoted to the role of exchange in various academic areas. This trend is not an exception in tourism research. In neoclassic economic theory, a market mechanism determines all transactions and economic relationships. The exchange enables stakeholders to gain benefits from transactions, thus increasing economic benefits for society. Therefore, the exchange is an essential component of a social and economic structure. According to Bagozzi (1975), there are three types of exchange in a market, which are restricted, generalized and complex exchange in terms of involvement of stakeholders in transactions. Restricted exchange refers to direct relationships between two stakeholders, and restricted exchange is also a reciprocal relationship. These relationships are a theoretical basis for social exchange theory because it posits that a social exchange is a reflection of stakeholders' social interactions among themselves.

In economic theory, one can assume that economic activities are results of relationships between a market and stakeholders. However, social exchange theory has paid attention to social interactions between stakeholders rather than economic interactions as results of a market mechanism. Bagozzi (1975) also categorized exchanges in a market by its meanings such as utilitarian exchange, symbolic exchange, and mixed exchange. Utilitarian exchange is an economic interaction between stakeholders, involving exchanges of goods, money, and services. Utilitarian exchange is a general meaning of exchange. Symbolic exchange is more important in tourism research because symbolic exchange refers to "the mutual transfer of psychological, social, or other intangible entities between two or more parties" (Bagozzi, 1975, p. 36). The symbolic exchange is a basis for tourism marketing, understanding residents-tourists relationships, and residents' support for tourism development. Mixed exchange is an exchange which involves both utilitarian and symbolic exchange in a market and the most common and realistic form of exchanges. Social exchange theory is an extension of mixed exchange because stakeholders evaluate their relationships between stakeholders by perceived outcomes of social interactions, including utilitarian and symbolic exchanges.

Social interactions in tourism are one of the most important tourism experience and information sources. Such interactions function as a signal to govern a tourism system like price in a market. Therefore, social exchange theory has been applied to many tourism research topics such as tourists and residents' perceptions of tourism (Byrd, Bosley, & Dronberger, 2009), residents' attitudes toward tourism development (Allen, Hafer, Long, & Perdue, 1993; Andereck, Valentine, Knopf, & Vogt, 2005; Andereck & Vogt, 2000; Chuang, 2010; Látková & Vogt, 2012; Nunkoo & Gursoy, 2012; Wang & Pfister, 2008), and residents' support of tourism development (Harrill, 2004; Perdue, Long, & Allen, 1990). Such research efforts viewed social interactions between stakeholders as economic and non-economic interactions in host communities, suggesting practical applications of social exchange theory in tourism research.

2.2 Research trends of the impacts of the hospitality and tourism industry

The hospitality and tourism industry is a place-based service industry, affecting a community and its residents. A tourism sector - a major component of the industry – has drawn scholars' attention to tourism impact research. The issue of tourism impacts on a local community is one of the most popular topics in tourism research. In the 1960s, tourism impact studies emerged to examine tourism economic impacts (Ap & Crompton, 1998). Initially, policy makers and community leaders introduced tourism development as an economic development engine and alternative income source for local residents' living; they expected that tourism generates positive economic impacts on local communities. Thus, during the 1960s much tourism development research was conducted to explore economic growth due to tourism development. However, in some cases, tourism also gives negative impacts on local communities, potentially degrading community living conditions. In the 1970s, many scholars realized that successful tourism development relies on residents' support(Sharpley, 2014). In the 1980s, the topic of tourism environmental impacts surged in tourism impact research, assisting in the formation of sustainable tourism (Z. Liu, 2003). These focused research topics indicated the necessity to understand these tourism impacts so as to harness tourism as a local development tool and to sustain tourism development. In Chapter 2, the present researcher reviews the relevant literature of the impacts of the hospitality and tourism industry on the local community and its residents.

2.2.1 Economic impacts of the H&T industry

Generating positive tourism economic impacts is as a primary motive for tourism development (Sinclair, 1998; Song et al., 2012). Tourism scholars have focused on positive economic impacts of tourism on a local community because policy makers and community leaders have attempted to harness tourism development as an economic engine to revitalize their community (especially in economically depressed areas). Measurement and estimations of tourism economic impacts are common research topics of tourism impact research (Jenny Briedenhann & Wickens, 2004; Horst, 2009; Milne & Ateljevic, 2001; Sinclair, 1998). Such research topics have stimulated the development of a research methodology for the tourism economic impact research, resulting in various research approaches like the Keynesian-type multiplier effect approach (Archer & Revell, 1977), Cost-Benefit Analysis (CBA) (Eadington & Redman, 1991), and the Input-Output model (IO) (Dwyer, Forsyth, & Spurr, 2004; Fletcher, 1989). The Keynesian-type multiplier effect approach is simple, but it provides a conceptual framework to explain how tourists' expenditures contribute to a local economy. Accordingly, tourism poses various economic impacts on the local economy. Tourism contributes to local sales, company profits, jobs, tax revenues, and income in a host community. Tourism scholars categorize these economic impacts into the direct, indirect, and induced economic effects of tourism by their sources. Because tourism economic impacts mainly result from customers' expenditures, the main economic effects from expenditures are called the direct economic effects of tourism. The indirect and induced effects are commonly called the secondary effects; the direct and secondary effects construct the total economic effect of tourism for a local community. In such a conceptual framework, primary tourism sectors (e.g. Accommodations, Amusements, Restaurants, Retail sales, and Transportation) generate the direct economic effects of tourism. Then they cause the secondary effects, affecting most sectors of a local economy and community.

The direct economic effects of tourism refer to the direct economic changes in a source of income, employment, and government revenue by changes from tourism expenditure. For example, an increase in the number of customers staying overnight at a hotel or visiting a local restaurant should lead to increased sales in the accommodations and restaurant sectors in a local economy. The additional sales and associated changes in hospitality and tourism in terms of wages and salaries, taxes, and services are the direct effects of tourist spending.

One of the most commonly mentioned direct economic effects of tourism is new employment opportunities in the hospitality and tourism sector within a host community (Archer & Fletcher, 1996; Sinclair, 1998; Solnet, Ford, Robinson, Ritchie, & Olsen, 2014). For example, residents' positive perceptions of tourism development is that the tourism industry creates more jobs in a local community (Tosun, 2002). Revenue and tax revenue from tourism activities are also commonly mentioned as direct economic effects of tourism. Residents who are engaged in the tourism sector rely on their primary income due to tourists' expenditures. Residents' income is also an economic impact source for other industries in a local community.

Indirect effects are economic changes resulting from direct economic effects, including re-spending of the hospitality and tourism industry's receipts and derivative sales. Derivative sales cause changes in sales, jobs, and income in an economic system. For instance, the food supply chain exemplifies indirect effects of changes in the restaurant industry. Companies supplying products and services to the food supply chain represent another link between the restaurant industry and many other economic sectors in a host community.

Induced effects are another economic change resulting from household spending; the household's income source is mainly from tourism spending. For example, employees in the hospitality and tourism industry spend their income for housing, food, transportation, and daily consumption for living. If employees get more income because of increased customers, the employees' households will have more income, thus spending more. Such additional spending causes increased sales, wages, income, and jobs in other industries of a host community. These added economic changes are induced effects.

With the direct, indirect, and induced economic effects of tourism, the hospitality and tourism industry affects virtually every sector of the local economy in a host community, changing economic conditions of a host community. Therefore, these economic impacts are directly related to the community's and residents' quality of life.

Another main stream of tourism economic impact study is about employment opportunities from hospitality and tourism. This stream could be segmented into specific research topics such as quality of jobs, employment structure, wages, and the gender gap. They are also related to poverty alleviation (Chok, Macbeth, & Warren, 2007; Zhao & Ritchie, 2007).

With positive economic impacts of tourism, it also has many hidden costs and negative economic impacts on a host community (Nunkoo & Ramkissoon, 2011; Smith & Krannich, 1998; Vargas-Sánchez, Plaza-Mejía, & Porras-Bueno, 2009). Frequently reported negative impacts are economic leakage, high cost of living, stress upon inadequate infrastructure, economic dependence of the local community on tourism, and seasonality of tourism (Jackson & Inbakaran, 2006; Jurowski & Gursoy, 2004). These issues create economic problems to host communities if they are heavily dependent on tourism. For example, according to some tourism research, about 80% of all-inclusive package tour travelers' expenditure leaked out of a local economy into the airlines, international hotel companies, and other international companies instead of local businesses and employees (Pearcy & Anderson, 2010). In this case, it is less likely for the hospitality and tourism industry to generate induced effects of tourism on a local economy. Tourism development can give a heavy financial burden to the local government and local taxpayers when the industry creates increased demand of the local infrastructure such as airports, roads, and public tourism facilities. Public spending on subsidized infrastructure may reduce government spending in other essential areas such as health, education, and security. Increasing demand of basic products, service, and community resources usually results in increased living costs, negatively affecting residents' attitude to tourism development. Both positive and negative economic impacts on the local communities are an important source for affecting living conditions of a community and residents' quality of life.

2.2.2 Social impacts of the H&T industry

Even though modern tourism development initiated from an economic development tool, it generates not only economic impacts but also social impacts on a local community. From the 1970s, as tourism was developing, some tourism destinations faced negative consequences of tourism development. Such consequences were quite different from the economic impacts that policy makers and community leaders expected. The consequences are associated with the social dimension of a local community. Common social impacts of tourism development are conflicts between residents and tourists, disruption, and delinquent behavior in the host community. Such negative consequences threaten tourism development.

Thus, tourism scholars have recognized that sustainable tourism development rests on effective management of social impacts and residents' support; they have conducted research concerning such topics (Deery et al., 2012).

According to contemporary research about tourism social impacts, social impacts of tourism development were commonly reported. Social impacts could be categorized into positive and negative impacts. Positive social impacts of tourism build awareness of cultural heritage, enhance cultural understanding and knowledge, improve pride of residents of a host community, and strengthen a place identity in residents' minds (Besculides, Lee, & McCormick, 2002; Gu & Ryan, 2008; Yamada, Heo, King, & Fu, 2011). Tourism development also increases social and cultural diversity, giving opportunities to enjoy cultural events and improved recreational activities (Ahn, Lee, & Shafer, 2002; Besculides et al., 2002). It can attract potential residents, who migrate from outside of the community because of economic impacts like job opportunity and improved sense of place, better infrastructure, and favorable community image (Faulkner & Tideswell, 1997; Perdue, Long, & Kang, 1999)

In tourism impact research, negative social impacts are an important topic. When residents perceive the severe negative social impacts from tourism development, it is inconceivable for the tourism industry to promote tourism without residents' support (Gursoy, Chi, & Dyer, 2009). Commonly reported negative social impacts are a conflict between residents and tourists, disruption of resident life, potentially higher crime rate, and overcrowding by visitors (Perdue et al., 1999; Smith & Krannich, 1998; Vargas-Sánchez et al., 2009). These negative impacts may downgrade living conditions of a local community, leading residents to perceive lower living conditions. Then, they are less likely to support tourism development.

To measure and analyze such social impacts, tourism scholars have focused on the social aspect of tourism development. Tourism social impact research has evolved through four stages of research development (Deery et al., 2012). At the early stage, tourism scholars mainly worked on the definitional issue of social impacts, providing descriptive findings of tourism social impact research (Belisle & Hoy, 1980; Duffield, 1982; J. C. Liu, Sheldon, & Var, 1987). In this stage, scholars attempted to reveal the true nature of tourism social impacts and its sources.

At the second research stage, much research focused on developing a research model to identify causal relationships between residents' perception on the social impacts and their opinion and support to tourism (Ap, 1992; King, Pizam, & Milman, 1993; Milman & Pizam, 1988). However, these studies maintained an exploratory aspect of research concerning social impacts of tourism because of lack of reliable measurement instruments.

During the 1990s, tourism scholars realized the need to develop reliable measurement instruments for the social impacts and paid more attention to instrument design and development. Tourism researchers needed to identify underlying dimensions of social impacts and its true nature (Andereck & Vogt, 2000; Ap & Crompton, 1998; Ko & Stewart, 2002; Lankford & Howard, 1994).

At the fourth stage, from the beginning of the 2000s, many tourism scholars attempted to refine existing measurement instruments. They utilized them in investigations of residents' perceptions of the social impacts of tourism development at the various destination settings (Choi & Murray, 2010; Choi & Sirakaya, 2005).

The current dominant research trend examines residents' perceptions and attitudes of tourism development. The underlying rationale for this approach is that residents can perceive tourism impacts on their community and their life, providing useful information despite tourism scholars' difficulty to measure impacts with objective data.

However, this dominant approach has some research limitations. Such limitations have been a roadblock to generalize research findings of social impact studies on tourism development. Many studies have reported that residents' perceptions and attitudes of tourism development can be changed by various external environmental variables (Pulina, Meleddu, & Del Chiappa, 2013; Zamani-Farahani & Musa, 2012). These include economic dependence on tourism (Andriotis, 2005; Haley, Snaith, & Miller, 2005), distance between residence and the center of the tourism destination (Jurowski & Gursoy, 2004), level of contact with tourists (Teye, Sirakaya, & F Sönmez, 2002), and ratio of tourists to residents (Horn & Simmons, 2002; J. C. Liu & Var, 1986).

2.2.3 Environmental impacts of the H&T industry

The environmental impact of tourism development is an emerging topic of tourism impact research. These impacts are related to changes in the quality and value of the natural and man-made environment because of tourism development. Interestingly, this topic was mainly examined as a part of economic and social impact research. For example, the valuation for environmental changes is a main topic of economic impacts research of tourism development. This topic mainly concerned how to evaluate the economic value of environmental tourism resources as non-market goods. Much effort has been conducted to calculate environmental value into monetary value to internalize the non-marketable value into a market system. Many scholars have believed that most problems are due to the externality and if the externality issue is internalized, current environmental problems will be resolved.

Initially, tourism scholars viewed the topic of tourism environmental impacts as part of tourism social impacts. The social impacts of tourism refer to the effects on host communities from direct and indirect relations among tourists, residents, the tourism industry, and the community's natural and man-made environments. Such effects are not always apparent and very difficult to measure. Accordingly, tourism scholars usually depend on residents' value judgments and perceptions about the impacts of tourism on their community and society. In this context, environmental impacts could be a subject of social impact research. In tourism social impact research, it is commonly accepted that environmental degradation is a source of negative perceptions about the social impacts of tourism.

Since the 1980s, in an attempt to explore environmental impacts of tourism, some academic efforts have contributed to a new research paradigm: sustainable tourism. After World War II, the world experienced rapid economic growth with dramatic resource consumption, causing severe economic, social, and environmental problems. To resolve such problems, many scholars proposed alternative theories and movements. One of them was environmentalism, which became a basis for sustainable development. The sustainable development paradigm can be traced back to the Brundtland Report of the World Commission on Environment and Development (1987). The report suggested the new paradigm and disseminated it. The main idea of sustainable development is that it is possible to achieve a balance between economic growth and conservation for natural resources. Likewise, in tourism, scholars have developed the concept of sustainable tourism for similar reasons. For example, modern tourism greatly developed after the post-war growth era since the 1940s, becoming the world's largest single industry. As with general economic growth that faced negative consequences of development, the tourism industry experienced similar issues and evolved similar development stages for dealing with environmental issues. Sustainable tourism was advocated as an outcome of such development stages in tourism research; tourism can sustainably and continuously develop by reducing the negative interactions among the tourism industry, visitors, the environment and the host communities (Bramwell & Lane, 1993).

According to previous research, tourism has given positive and negative environmental impacts to local communities (Filimonau, Dickinson, & Robbins, 2014; Gladstone, Curley, & Shokri, 2013; Hsieh & Kung, 2013; J. W. Lee & Brahmasrene, 2013; Saenz-de-Miera & Rosselló, 2014). To be specific, the hospitality and tourism industry utilizes the community's resources, affecting its natural and man-made environments. For example, according to Liu et al. (1987), one of the most important positive impacts is greater recognition of the importance of environmental and natural resources. Greater environmental awareness is also a consequence of positive environmental impacts and stimulates the general public to participate in reducing environmental pressures from tourism (Miller, 2001).

With respect to negative tourism environment impacts, Ap and Crompton (1998) classified negative impacts into seven categories: effect of pollution, loss of natural landscape, destruction of flora and fauna, degradation of landscape & historic sites, effects of congestion, effects of conflict, and effects of competition. Accordingly, negative environmental impacts of tourism may damage the natural surroundings, destroy of the local ecosystem, increase environmental contamination, and cause unpleasant overcrowding of public and leisure spaces (Vargas-Sánchez et al., 2009). Recently, much research has been devoted to tourism impacts on air quality because some researchers are concerned that such an environmental issue is one of the primary causes of disease, health problems, and long-term livelihood degradation of local communities. Tourism development and tourism-related transportation are potentially responsible for air quality degradation (Filimonau et al., 2014; J. W. Lee & Brahmasrene, 2013; Saenz-de-Miera & Rosselló, 2014). These negative environmental impacts may affect living conditions, changing residents' QOL and attitudes to tourism development (Jurowski & Gursoy, 2004; Perdue et al., 1999).

2.2.4 Impacts of the hospitality and tourism industry on host community living conditions

Tourism development affects a host community, community residents' perceptions, attitudes, and way of life (Andereck & Nyaupane, 2011a; Andereck & Vogt, 2000; Ap & Crompton, 1998; Choi & Sirakaya, 2005; Wang & Pfister, 2008). Pioneering tourism scholars have focused on the possible impacts of tourism on the host community and residents' quality of life, listing an impressive range of both positive and negative impacts on the host community as the consequences of tourism development (Andereck & Nyaupane, 2011a; Bender, Deng, Selin, Arbogast, & Hobbs, 2008; Jackson & Inbakaran, 2006; Wang & Pfister, 2008; Yamada et al., 2011). For example, tourism creates jobs, generates tax revenue, and builds awareness of the host community to outside of the community (Simpson, 2008; Vanegas, 2010). Alternatively, tourism development poses negative impacts on the host community because development sometimes requires social, cultural, and environmental degradation (Johnston & Tyrrell, 2005; Nunkoo & Ramkissoon, 2011; Vargas-Sánchez et al., 2009). These impacts can be summarized as economic, social, and environmental impacts of tourism of a host community. Theoretically, such impacts are results of social transactions. Social exchange theory describes how and why such social transactions occur, providing a theoretical foundation for the significant impacts of tourism development on the host community (Andereck et al., 2005; Buunk & Hoorens, 2011; Langford, Bowsher, Maloney, & Lillis, 2008; Perdue et al., 1999).

2.3 Quality of life

Quality of Life (QOL) or happiness is one of the fundamental topics of a philosophical discussion. QOL has attracted many social scientists' attention because the ultimate goal of society is to improve communities' and residents' QOL (Chancellor, Yu, & Cole, 2011). For example, Aristotle, an ancient Greek philosopher, explored the origin of true happiness and a way to get it (Ng, 2008). Many Eastern philosophers also sought true happiness, suggesting a balanced life between individuals' desire and reality (Diener & Suh, 1997). In modern societies, scholars have continued to explore what is true happiness and good quality of life. However, this topic remains a developing research area. Tremendous research is needed to define good quality of life and to measure QOL in various research areas because QOL is not a universal term. In this section, the present researcher reviews the fundamental issues of QOL: its definition and measurement.

2.3.1 Definition of QOL

In modern society, QOL has become an important subject of social sciences. Most citizens have viewed a better life as more than economic prosperity. Historically, after World War II, the world economy experienced significant economic growth and faced various negative social and environmental consequences (Bieger, Beritelli, & Laesser, 2009; Cobb & Rixford, 1998). With respect to the phenomenon, some social scientists found a clue to resolve such problems from QOL theories and practices. However, to apply QOL theories to various social science fields, one should accurately define good QOL yet an universal definition of QOL is lacking. According to Andereck and Nyaupane's work (2011b), QOL remains an ill-defined social concept with more than hundred QOL definitions and models. The definition of QOL is becoming more fragmentized as social scientists apply QOL theories to various research areas. One possible reason why QOL research has showed such a high plurality is that each QOL research is based on its own academic perspectives and objectives. QOL researchers conduct their research at different units of analysis using various ways to measure QOL. The present researcher explains how these factors affect the definition of QOL as follows.

Different academic perspectives of QOL

Even though many social scientists in diverse disciplines agree with the general objective of a QOL application is to improve QOL, each academic discipline has its own viewpoint on its conceptualization and definition. This is because most definitions of QOL imply an evaluation (Diener et al., 2009). Such characteristics cause crucial differences in definitions of QOL because the objective of that evaluation may be different according to various disciplines. Some definitions emphasize desirable outcomes of a policy implementation or specific aspects of individual living conditions. Therefore, QOL researchers in different academic areas need to tailor a general concept of QOL for their own specialty. For instance, in health science, the basic objective of QOL is being healthy.

Thus, the researchers modified the general concept of QOL and suggested Health-related Quality of Life (HRQOL). It is commonly defined as "the way in which physical, emotional and social well-being are affected by a disease or its treatment" (Calvert & Freemantle, 2003). Researchers have an interest in the change of patients' QOL/Life satisfaction between pre-events and post-events (e.g. a disease and medical treatment) and the way to improve patients' QOL using specific treatments. Technically, the QOL measurement relies on patients' subjective perceptions of their life.

In psychology, researchers emphasize the usability of the Subjective Well-Being (SWB) construct instead of QOL, suggesting that SWB is a core component of QOL. Objective QOL research in the field uses SWB as a research tool to investigate how people perceive their life. Diener (2000) defined SWB as "people's evaluations of their lives-evaluations that are both affective and cognitive". An underlying idea of such a definition is that individuals' happiness is the results of subjective judgments of their life. Researchers' primary concern is to explore how individuals perceive their life and related factors (e.g. social economic status, demographic, genetic, and cultural variables) to affect their perceptions.

In economics and sociology, QOL is a social and economic barometer of regional and national development (Leigh & Blakely, 2013). Economists think that the objective of QOL is being wealthy. Therefore, QOL itself is considered a crucial policy goal. For example, the United Nations Human Development Index (HDI) is a composite index of average achievement in basic dimensions of human life. Achievement indicators include life expectancy, education, and standard of living (i.e. income). The objective of such an index is to help policy makers design better measures and practices to improve nations and communities' QOL. One of the basic functions of the international level index is to provide reference data to compare the QOL levels of participated countries. The researchers tended to provide a concise and operational index using a unidimensional index, affecting the formation of QOL definition.

In summary, different QOL definitions can exist according to various academic disciplines because their objective and approach may be different. Therefore, in tourism research, one should define tourism-related QOL because tourism research also has unique objectives.

Unit of analysis of QOL

The unit of analysis for QOL research is a significant factor for the high plurality of the QOL definition. By the unit of analysis, the QOL definition can vary. According to Sirgy et al. (2000), QOL may be measured at the individual, household, community, regional and national level. At each level, its own QOL definition and models have developed. For example, the Physical Quality of Life (PQLI) is a well-known QOL index at the national level. PQLI measures basic conditions of humans' life and is defined as a function of life expectancy, infant mortality, and basic literacy. The index emphasizes health as an important domain of QOL.

Another well-known QOL measure is the United Nations Human Development Index (HDI). It was developed in 1990 and represented the broad ideas of QOL. HDI includes measures of life expectancy, education, and standard of living; the index quantifies objective indicators of QOL at the national level. It has played a key reference index to compare the QOL levels of countries. However, HDI provoked harsh criticism because the index is based on a very narrow definition of QOL (Berenger & Verdier-Chouchane, 2007).

The Happy Planet Index (HPI) is another well-known national-level QOL index (New Economics Foundation, 2006). It includes the per capita environmental footprint of most developed and developing counties as well as an average happiness and life expectancy index. This approach highlights the environmental aspect of QOL.

A common feature of such national-level QOL indices is that they use a composite index building strategy to provide a comprehensive understanding of national-level QOL. However, they also have been criticized by the advocates of multi-dimensional QOL theories because the existing approach intends to generate single dimensional QOL indices. Even though the approach can enable researchers to evaluate and compare the QOL levels of nations, such simplicity could prevent researchers from investigating potential dimensions of QOL.

Contrary to the national level QOL indices, individual-level QOL research has taken a different analytical strategy, proposing multi-dimensionality of QOL in terms of its definition and measurement. This is because individual-level QOL researchers contend that individual's overall life satisfaction is a function of various QOL sub-domains. Such domains represent different dimensions of individual-level QOL. According to the satisfaction hierarchy model (Sirgy, 1998), the overall life satisfaction is affected by contentment with various life domains, subdomains, and life concerns. Dolnicar, Yanamandram, and Cliff (2012) applied this approach to their research and defined QOL as "an individual's subjective evaluations of the degree to which his or her most important needs, goals, and wishes have been fulfilled". They argued that such life domains are a basis for evaluating overall life satisfaction and QOL.

Another important unit of QOL research is community-level QOL. Community-level QOL research remains very complex because its definition and measurement approach are diverse. Some researchers have applied the individual-level QOL measurement approach into community-level QOL research; they believe that residents' perceptions of their life in a community can reflect community-level QOL (Allen, Long, Perdue, & Kieselbach, 1988; Andereck & Nyaupane, 2011a; Han, Fang, & Huang, 2011; Kim, Uysal, & Sirgy, 2013; Nunkoo & Ramkissoon, 2011; Sirgy et al., 2000). However, such an approach can lead to different results by research design and experiment as well as suggest different QOL definitions. This is because researchers have relied on limited survey data and respondents' subjective perceptions on community-level QOL. They could be affected by various social, demographic, and economic factors at the individual level. In the present study setting, research results could be biased unless QOL researchers carefully control external factors. This is potentially a weakness of subjective perception-oriented QOL research.

Another approach of community-level QOL research is to utilize objective social indicators for investigating community-level QOL (Sherrieb, Norris, & Galea, 2010). Such an approach can yield objective information on community QOL, but the limited data availability of community-level QOL is one of the main obstacles of this approach. Recently, some researchers have attempted to propose a mixed method approach, combining survey data and objective social indicator data into a single data framework (Cook et al., 2009). Such an approach could enable researchers to get a deep understanding of community-level QOL as well as overcome limitations of existing approaches. The semi-mix-method utilizes a unique feature of synthesized information from individuals' perception-based information and objective QOL indicators. They can provide different but complementary information of community-level QOL as well as a framework for defining QOL.

Subjective VS. objective indicator-oriented QOL definitions

There are two main approaches for defining QOL - objective and subjective indicator-oriented QOL definitions. These definitions reflect different understandings of the QOL concept. The distinction between the two definitions originates their conceptual and methodological ways to define QOL. To be specific, the objective indicator approach uses societal measures to indicate residents' living conditions in a given geographical area. Objective QOL researchers think that such living conditions directly affect community and residents' QOL. This approach is free from residents' subjective perceptions of their life (Diener & Suh, 1997). On the contrary, the subjective indicator approach is a way to measure residents' perceptions of QOL, which are related to residents' multi-dimensional evaluations of their QOL (Glatzer, 2006). This approach argues that individuals' judgment of their life is a more effective measurement than measuring residents' living conditions. However, both approaches have been fundamental in QOL research and definition. Such a distinction acts as an important criterion to distinguish QOL research. Table 2-1 shows classification and examples of QOL research by its method of measurement and unit of analysis.

Table 2-1: Classification and Examples of QOL Research

	Subjective indicators	Objective indicators	Combination of subjective and objective indicators
Individual	Health-related QOL, Tourists' QOL, Residents QOL1, and Subjective well-being		
Community	Residents QOL2	Community QOL from objective living conditions	Current research
Regional		Regional QOL from objective living conditions	
National		HDI PQLI	Happy Planet Index OECD Better Life Index

2.3.2 How to measure Quality of Life

Initially, good QOL was highlighted as an important policy outcome, and Gross Domestic Product (GDP) per capita was considered as the most representative indicator to measure QOL (Becker, Philipson, & Soares, 2003; Diener & Suh, 1997). The initial purpose of QOL research was to examine the current level of economic QOL and to provide useful information for evaluating effectiveness of a public policy that intended to improve residents' QOL (Sirgy, 2011), the application of QOL theories has been extended to various research areas like healthcare, public policy, regional development, and tourism. Social scientists realized that an economic matter is only one dimension of the quality of life domains (Becker et al., 2003; Scott, 2009). However, as citizens realized true happiness is more than economic prosperity, they wondered if there are other ways to measure life's meaning. To capture a holistic picture of QOL, scholars have attempted to develop a robust way to measure QOL since the 1980s by constructing relevant social indicators. Such attempts are based on two main definitional perspectives: objective and subjective indicator-oriented QOL approaches. Another methodological framework (i.e. reflective and formative indicator approaches) also has contributed to QOL measurement development.

Subjective VS. objective QOL measurement framework

Subjective and objective QOL indicator approaches are basic notions in defining QOL and measuring QOL. As mentioned in Chapter 2.3.1, the subjective QOL indicator approach relies on respondents' multi-dimensional perceptions of their life to measure the individual-level QOL. The measuring procedure is grounded in psychological methodologies and mainly multivariate statistical techniques such as exploratory factor analysis, confirmatory factor analysis, and structural equation modeling. A recent example of such an analytical application in tourism research is Andereck and Nyaupane's work (2011b). Andereck and Nyaupane investigated residents' perceptions of tourism impacts on residents' QOL, examining the relationship between their perceptions on life domains and tourism impacts in communities. They identified eight QOL domains: 'Recreation amenities', 'Community pride and awareness', 'Economic strength', 'Natural/cultural preservation', 'Community well-being', 'Way of life', 'Crime and substance abuse', and 'Urban issues'. The study suggested how to conduct QOL research at the community level using the subjective indicator framework. However, the subjective QOL indicator framework has an innate limitation. If the research findings are based on the survey information of a single host community or limited geographical area, it is difficult to generalize survey results and synthesize new research findings (Meng et al., 2010).

Contrary to the subjective indicator approach, the objective indicator approach is based on objective social indicators, consisting of official social statistics rather than individuals' perceptions of their living environment and life. Objective indicators measure key living dimensions like material, social, and environmental aspects of the living environment and life (Sirgy, Lee, Miller, & Littlefield, 2004). Fang, Xiangping, and Muzaffer (2010) examined the relationships between tourism development and local residents' quality of life using objective indicators of QOL. Their study utilized 17 objective QOL indicators so that the researchers examined tourism impacts on specific life conditions at the regional level; income, consumption composition, residence quality, transportation, education, social security, health care, life expectancy, public security, and employment were among them. These indicators showed a broad perspective of QOL in society and tourism impacts on it.

However, the objective indicator approach has strengths and weaknesses in term of methodology. The most apparent strength is its objectivity without depending on individual perceptions. Moreover, this strength enables researchers to compare the level of QOL at the national, regional, and community levels regardless of residents' perceptions, subjective opinion, and interests. If policy makers and local community leaders need to compare and evaluate the QOL levels of communities, the objective indicator approach provides accurate policy information.

The objective indicator approach has some limitations. As objective indicators rely on social statistics, the indicators do not include residents' subjective judgment or feeling about their life, preventing interference of subjective bias from residents' perceptions and acquiring objectivity. Therefore, the objectivity is a double-edged sword for QOL researchers because subjective life satisfaction is also an important component of good quality of life.

Reflective and formative measurement approach of QOL research

A measurement model in QOL research can be categorized into two different conceptual approaches, such as reflective and formative indicator model approaches (Coltman, Devinney, Midgley, & Venaik, 2008; Diamantopoulos & Siguaw, 2006; Kieffer, Verrips, & Hoogstraten, 2009). In the reflective indicator approach, QOL researchers assume a latent variable affects objective or subjective observable indicators, causing changes to the indicators. The changes can reflect the true effects of a latent variable on other social constructs. Thus, it is possible to measure the effects of a latent and invisible social construct by examining observable indicators. Statistically, the effects can be explained by the partial correlations with latent variables and observable indicators. Such correlations empirically support theoretical relationships between the latent variable and observable indicator. Such a statistical notion is a basis for the reflective measurement approach. In the reflective measurement model, a factor analysis technique plays a key role in identifying the dimensions of the latent variables and verifying reliability of measurement items. A typical example of the reflective measurement approach can be found in the individual-level QOL research. It focuses on individuals' perceptions of their life, identifying the underlying dimensions of perceived QOL.

Contrary to the reflective measurement model, the formative measurement model is a bottom-up explanatory approach (Maggino & Zumbo, 2012). In this approach, QOL researchers consider measurement indicators as a source of changes for a latent variable. Changes in formative measurement indicators cause the changes of a latent variable. Therefore, a latent variable can be defined as a function of formative indicators. In the formative measurement model, causality flows from the formative indicators to the latent variable. Traditionally, the formative measurement model has been used in the development of a composite index, synthesizing a new index through principal components analysis (Zumbo, 2007). A noteworthy example of a formative measurement approach is the Human Development Index (HDI), consisting of three national level objective indicators: life expectancy, education, and income. Each indicator equally contributes to building the HDI index, a proxy variable of QOL at the national level. Since such indicators are a component of QOL index, a change in an indicator does not always mean a same directional change with the other indicators. For example, a higher income or educational level does not always correlated with longer life expectancy. In the formative indicator approach, such a situation means a low level of QOL. However, in the reflective measurement model, the situation can cause a severe problem in terms of internal correlation and reliability of measurement items.

Dimensionality of QOL

The multidimensionality of QOL is an important characteristic to distinguish between the reflective and formative QOL measurement approach. Both QOL measurement models are based on a similar QOL theory foundation but different measurement assumptions about the QOL construct. Traditionally, researchers that follow the formative measurement approach view QOL as a one-dimensional QOL construct. Yet those who follow the reflective measurement approach regard QOL as a multi-dimensional constructs. This is mainly due to the difference of QOL research objectives. For instance, the reflective approach's main objective is to identify residents' QOL perceptions and significant factors affecting the perceptions. The formative measurement approach's objective is provide key information to evaluate and compare the QOL level of communities and regional areas. However, such a trend has changed since Stiglize, Sen, and Fitoussi proposed a multi-dimensional index framework for the measurement of economic performance and social progress (Stiglitz, Sen, & Fitoussi, 2010). That approach is considered an innovative way to investigate the QOL level of nations and local communities.

At the individual and community level of QOL research, reflective measurement has been widely used rather than formative measurement. Those who conduct QOL research at the individual and community level presume that QOL is a multi-dimensional construct covering all aspects of human life (Berenger & Verdier-Chouchane, 2007). They proposed various QOL domains. However, there is little agreement on the type of general QOL domains. For example, at the initial QOL research stage, some researchers argued that QOL has five basic domains: health, intimacy, emotional, material well-being, and productivity (Flanagan, 1978). However, Cummins, a leading QOL researcher, proposed a seven-QOL-domains model, which include material well-being, health, productivity, intimacy, safety, community, and emotional well-being domains (Cummins, 1996). Diener and Suh (1997) provoked more controversy about this topic by suggesting a different approach. They emphasized four social indicators - health, safety, economic, and other social indicators (e.g. education, human rights, welfare, and ecology) – by proposing a method that combined social and subjective indicators into a single research framework.

In 2009, the Commission on the Measurement of Economic Performance and Social Progress (CMEPSP) accepted Diener's approach. The CMEPSP was initiated by the French government to overcome limitations of an existing QOL measure like Gross Domestic Production (GDP). The CMEPSP members proposed a conceptual model for measuring QOL at the national level. Their work combined objective and subjective dimensions of QOL, suggesting nine universal domains of QOL. At the national or community level QOL framework, defining QOL domains inevitably involves value judgment. Their work helped QOL researchers define essential QOL domains. To fulfill the objective of QOL index building (i.e. comparability of QOL level), defining universal values of QOL is important. The CMEPSP consists of 30 world-known economists, sociologists, and QOL experts. Their work is the result of deliberate consideration on a universal value, providing a theoretical framework for QOL research at the national level. For example, OECD Better Life Index has been developed on the basis of the theoretical framework, suggesting eleven

QOL domains. The index also includes material living conditions, objective QOL domains, and a subjective well-being component.

In tourism-related QOL research, more specific QOL sub-domains are proposed. As the present researcher described in Chapter 2.3.1, Andereck and Nyaupane (2011b) examined the relationship between residents' perceptions of tourism impact and their QOL. They proposed eight QOL domains from residents' perceptions, indicating 'community well-being', 'urban issues', 'way of life', 'community pride and awareness', 'natural/cultural preservation', 'economic strength', ' recreation amenities', and 'crime and substance abuse'. Compared to general QOL domains, these tourism-related QOL domains emphasized community QOL and tourism social impacts. With a similar context of Andereck's work, Yamada et al. (2011) suggested that a proxy variable for residents' perceived QOL is overall life satisfaction, which is affected by five QOL sub-domains (e.g. health perception, wealth, safety, community contentment, and cultural tourism development). They concluded that economic and social QOL domains are one of the most influential factors to affect overall life satisfaction. With respect to the spatial aspect of tourism, Chancellor et al. (2011) studied tourism destination residents' perceptions of their QOL. Their study viewed overall life satisfaction as a proxy variable for residents' QOL (i.e. uni-dimensional construct), exploring the impacts of living conditions of a local community on residents' overall life satisfaction. Their study applied the core-periphery theory into tourism impacts on residents' QOL to examine the impacts of tourism on residents' QOL. In the research, overall life satisfaction was treated as a uni-dimensional general QOL construct indicating the current level of QOL.

Another important topic of tourism QOL research is tourists' QOL rather than residents' QOL. Some tourism QOL studies also supported the multidimensionality of tourism-related QOL. Neal, Uysal, and Sirgy (2007) explored the effect of tourism experience on travelers' overall QOL. They postulated that individuals' life satisfaction has a hierarchical structure of satisfaction and life satisfaction is affected by the satisfaction of tourism-related experience (i.e. travel, destination, and tourism activity) and general life satisfaction domains (e.g. job, personal health, social life, material prosperity, and subjective life satisfaction). Their research highlighted links between satisfaction with tourism services and satisfaction with life in general.

Some tourism researchers investigated external factors to affect residents QOL in a tourism context. The most commonly mentioned factor is the impacts of tourism development at a local community. Kim et al. (2013) asserted that residents' perceptions on tourism impacts affect residents' QOL domains. According to their research, tourism impacts can be categorized into four areas: economic, social, cultural, and environmental impacts. Such impacts affect residents' perceptions of key QOL domains like material, community, emotional, and health & safety. Their theoretical model is very similar to an existing tourism impact framework. Research findings indicated that tourism impacts are one of the important sources of residents' perception changes on their QOL.

From a tourism context, tourism-related QOL domains can be grouped into three societal dimensions: economic, social, and environmental. Generally, in the formative QOL index approach, the possibility of multidimensionality in QOL can easily be neglected; researchers suggest a unidimensional QOL index. However, from a tourism impact perspective, adapting the three pillars of tourism impacts as the basis for analyzing impacts of tourism on community QOL should be reasonable since tourism affect various community QOL domains differently. The notion of three pillars of tourism impacts on community QOL may provide a concrete theoretical and empirical rationale for each of the three domains that have been proposed, explaining how the tourism industry affects society and lives of individuals. In Table 2-2, general and tourism-related QOL dimensions are presented.

Table 2-2: General and Tourism-related QOL Domains

Publication details	**No. of domains**	**Domains details**
(Andereck & Nyaupane, 2011)	8	Community well-being, Urban issues, Way of life, Community pride and awareness, Natural/cultural preservation, Economic strength, Recreation amenities, Crime and substance abuse
(Andereck et al., 2007)	4	Negative QOL impacts, Positive QOL economic impacts, Positive QOL sociocultural impacts, and Positive QOL environmental impacts
(Cummins, 1996)	7	Material well-being, Health, Productivity, Intimacy Safety, Community, and Emotional well-being
(Kim et al., 2013)	5	Material well-being, Community well-being, Emotional well-being, Health and safety, Life satisfaction
(Nawijn & Mitas, 2012)	10	Friends, Family, Interpersonal relationships, Economic situation, Job, Neighborhood, Self, Services and infrastructure, Health, and Politics

Table 2-2: General and Tourism-related QOL Domains (continued)

Publication details	**No. of domains**	**Domains details**
(OECD, 2011)	11	Income, Jobs, Housing, Health, Work-life balance, Education, Social connections (community), Civic engagement, Environmental quality, Personal security(safety), and Subjective well-being
(OECD, 2014)	9	Income, Jobs, Housing, Health, Education and skills, Environmental quality, Personal security, Civic engagement and governance, and Accessibility of services
(Qian & Yarnal, 2011)	4	Physical, Psychological, Social, and Environmental
(Stiglitz et al., 2010)	9	Material living standards, Health, Education, Personal activities including work, Political voice and governance, Social connections and relationships, Environment, and Personal security (safety)

2.3.3 Index building strategy in the present research

In the previous section, the present researcher described why previous QOL research has shown such great plurality in defining and measuring QOL. According to the literature review in the present research, the way of defining QOL and QOL measurement models can be different according to various criteria. Specifically, the unit of QOL research and QOL measurement framework (i.e. objective and subjective indicator models) are among the most important factors concerning the QOL definition and its measurement. The present research reflected these criteria, suggesting an innovative approach for community

QOL research. For example, the QOL model in the current research can be summarized as community level, a combination of objective and subjective indicators, and formative (i.e. index construction approach) indicator approach. Given that most of previous tourism QOL research has taken a very similar approach (e.g. community level, subjective indicators, and reflective indicator approach), the present study shows noteworthy uniqueness with methodological advantages over conventional tourism-related QOL research. Specifically, subjective indicators-oriented research relies on individual's perceptions within a limited geographical area, having a potential limitation to generalize research results in other areas. With respect to the limitation, the present research proposed a new method, utilizing both objective social indicators and residents' subjective judgment on their life. The present research analyzed over 775 of American counties and their residents using a combined research database. Such a method helps tourism researchers to analyze community-level data and generalize research findings, providing objectivity of QOL measurement and comparability of QOL index among communities. Therefore, the present approach should be beneficial to policy makers, local community leaders, and tourism scholars.

QOL index building procedure

The present researcher modified Sherrieb's research steps (2010) for measuring community level indicators, suggesting the following steps:

1. To review relevant literature to identify potential domains of QOL;
2. To make a complete list of relevant indicators to identified QOL domains;
3. To identify data sources;
4. To select relevant indicators by indicator selection criteria;

5. To reorganize selected indicators into tourism-related QOL domains by tourism impact theories; and
6. To conduct PCA to refine indicators into potential components by tourism-related QOL domains

For the first step, after reviewing relevant literature of community QOL, the present researcher decided to apply the theoretical framework of the Commission on the Measurement of Economic Performance and Social Progress (Stiglitz et al., 2010). As shown in Table 2-3, the framework proposes nine universal QOL domains, including objective QOL indicators and a subjective well-being component, overcoming limitations of existing QOL research.

Table 2-3: Comparison between CMEPSP's Conceptual Domains of QOL and QOL Domains of the Present Research

CMEPSP's Conceptual Domains of QOL	Present Research
Material living standards	Income
	Non Poverty
Personal activities including work	Employment
Education	Education
Health	Health
Political voice and governance	Civic engagement
Subjective well-being (life satisfaction)	Subjective well-being
Social connections and relationship	Social connections
Safety/personal security	Safety
Environment	Environment

For the next step, the researcher reviewed a list of county-level social indicators from the United States Census Bureau to generate a complete list of relevant indicators which correspond to the identified QOL domains. The researcher utilized MASTDATA (https://www.census.gov/support/USACdata.html#flag05), a meta-database of county-level variables. It contains 6312 of county-level variables' names and their sources. After review, the researcher identified potential indicators. However, the researcher expanded the variable search process because the present research needs more variables to correspond to QOL domains.

The next step was to select relevant indicators by established indicator selection criteria. OECD Better Life initiative suggested several variable selection criteria. The present research tailored such criteria by community-level research, establishing three criteria. The first is that indicators have face validity. The observed indicators should be easily interpreted as a measure of identified QOL domain. The second is that selected indicators are commonly used and accepted as well-being indicators in academic areas. The third is that selected indicators should have comparability across communities and counties. After completing the current research, outcomes should contribute to the development of community-level QOL research in other regions. Ideally, indicators need to be comparable for the different research settings.

The next step was to reorganize selected indicators into tourism-related QOL domains by tourism impact theories. This is an essential step in tourism-related QOL research since the main purpose of the present research is to investigate the impacts of the hospitality and tourism industry on community QOL from a tourism perspective.

The final step was to conduct Principal Component Analysis (PCA) to refine indicators into potential components by tourism-related QOL domains. PCA results generate QOL indices as dependent variables, becoming a basis of community-level QOL research.

Three tourism-related QOL indices

Tourism has changed society in various ways. Traditionally, tourism researchers have agreed that tourism impacts can be categorized into three dimensions: like the economic, social, and environmental. Such impacts can also be a source of tourism impacts on community QOL. In the early stage of tourism impact research, researchers tended to use objective indicators to analyze tourism impacts on local communities. However, their efforts have been challenged by some methodological limitations such as lack of relevant and accurate information. Recently, tourism researchers have tried to overcome such limitations by utilizing residents' perceptions so that they can analyze tourism impacts on local communities and residents. Tourism-related QOL research is an advanced application of tourism impact research. Its researchers focus on measuring individual- level life perceptions, enlightening the changes of individuals' QOL. However, recent studies of tourism-related QOL research frequently overlook the theoretical background of tourism impacts.

In the present study, the researcher has applied tourism impact theories to QOL research, suggesting three tourism-related QOL indices such as the material QOL, social QOL, and environmental QOL. These domains are applicable for three reasons. First, this approach is in accordance with tourism impact theories. Triple-bottom-line or three pillars approach is concrete conceptualization of tourism impacts; this framework can be equally applied to tourism-related QOL research. As the QOL definition in the study is differences at the QOL level, caused by tourism impacts, the tourism impact theory can be a foundation for the research.

Second, this approach could relieve a drawback of a generalized QOL index approach (i.e. a unidimensional QOL index approach). Even though the generalized QOL index bring convenience and simplicity to QOL researchers in evaluating and comparing, such an index costs detailed information for QOL indicators. The three tourism-related QOL index approach is tailored to tourism and tourism impact theories, providing meaningful information about how tourism affects community QOL domains.

Third, this approach is relevant to tourism-related QOL domains. As mentioned in Chapter 2.2.4, general QOL domains could be categorized into three tourism related community QOL domains: material, social, and environmental. Even though individual-level QOL research showed a great multiplicity of QOL domains, most QOL domains belong to these domains, making the three tourism-related QOL indices empirically relevant.

Material QOL index

According to the historical perspective of tourism impact research, early studies focused on tourism economic impacts of local destinations; in many cases, tourism was proposed as an economic development tool in economically-depressed areas (Andriotis, 2002; Jenny Briedenhann & Wickens, 2004; Gannon, 1994; Park, Lee, Choi, & Yoon, 2012). Tourists' expenditure was considered an important source of such economic impacts, which include additional income, new job opportunities, and improved economic conditions of tourism destinations. In the present study, the researcher proposed household median income, poverty rate, and employment rate in a community as proxy variables for measuring material QOL. These variables are commonly used in many QOL and social science studies (Diener & Diener, 1995; Puczkó & Smith, 2010).

Theoretically, such variables are supported by economic theory. In consumer demand theory, individual's utility is a unit of satisfaction. It is determined by the amount of product consumption, a function of consumers' income and product price. Income governs their budget and feasibility of production consumption bundles. Therefore, the income level of households is an important factor in determining consumers' utility: happiness. In the present research, the researcher defined household income as the amount of money that a household earns and can spend on goods and services. Even though higher income does not always mean a higher level of happiness (Dann, 2001; Diener & Biswas-Diener, 2002), it is an essential source for achieving daily needs and maintaining higher living standards. Higher economic wealth also provides many opportunities in life, leading to access to quality social services and opportunities like education, better nutrition, and effective healthcare service.

In tourism-related QOL research, the importance of the material QOL domain was frequently mentioned (Matarrita-Cascante, 2010; Moscardo, 2009). Personal income and increased jobs are common positive impacts of tourism on the material QOL (Frauman & Banks, 2011). For example, Moscardo (2009) said that tourism affects five different types of essential capital: financial, social, human, physical, and natural. These impacts also affect individual's QOL domains.

If household income is an annual measure of household members' financial resources, the poverty rate in a community can be an indicator for households' financial worth or material QOL level. The poverty rate in a community indicates the rate of households that lack financial resources to access goods and services that a household needs. From the pro-poor tourism perspective, it has been argued that tourism is the engine of economic development in many poor countries to mitigate poverty by providing local jobs (Jennifer Briedenhann, 2011; Higgins-Desbiolles, 2006); thus one can assume that local poverty rate is affected by tourism activities. Poverty rate can be a proxy variable to measure the level of material QOL.

Since tourism is service-intensive, the tourism industry creates and provides many local job opportunities to communities. As the present researcher previously mentioned, a job is a source of economic benefits, self-development, socialization, and self-esteem. Thus, a high level of employment can mean a higher level of QOL. Moreover, given that unemployment brings more severe negative impacts on individuals' life, the employment rate in a community should be a good indicator to measure material QOL.

Social QOL index

The hospitality and tourism industry affects various aspects of society, influencing social QOL of a local community. Such an influence can be measured by various social QOL indicators: the crime rate of a local community, educational achievement, life expectancy, social & emotional support from family and friends, and residents' life satisfaction. According to CMEPSP's theoretical framework (Stiglitz et al., 2010), these indicators reveal social living conditions of a local community. For example, community or personal safety has been regarded as one of the most important living conditions of a local community and a core element of overall QOL (Cummins, 1996; Helliwell & Putnam, 2004; Yamada et al., 2011). In the present study, to measure the safety in a community, the research used a proxy variable for community safety. The variable comes from the crime rate of a local area, indicating the risks of people being victimized by crime. Initially, violent crime rate and property crime rate were considered as safety indicators. The researcher combined them into a single measure of safety. Some tourism impact studies frequently mentioned that residents perceive that a higher crime rate is one of the negative consequences of tourism social impacts (Andereck & Nyaupane, 2011b), indicating such impacts affect their life (Deller, Tsai, Marcouiller, & English, 2001; King et al., 1993). Generally, crime leads to physical damage of individuals, loss of life and property, and a high level of crime rates severely degrades individual and community QOL. Therefore, the crime rate could be an important indicator to measure social QOL (Benckendorff et al., 2009; Cecil, Fu, Wang, & Avgoustis, 2008).

Also education is an important indicator to measure social QOL (Ross & Willigen, 1997) because the higher level of education represents more potential for improving personal and community's life (Khizindar, 2012). In the present study, educational attainment was used as a proxy variable for reflecting education in a community. Such a variable has been a key proxy variable to measure social QOL in many international-level QOL studies (Diener, 1995; Zhan, 1992) and is directly linked with material QOL. As the present researcher previously mentioned, tourism is likely to improve material QOL. It creates more opportunities to a local resident, allowing individuals to access better services, such as healthcare and education. Basically, education plays a crucial role in providing individuals with job-related skills and knowledge to participate in society and the economy. In turn, better education leads individuals to better material QOL. Many studies show that educated individuals have more income, live longer, and participate more actively in politics and in the community (Cochrane, OHara, & Leslie, 1980; Meara, Richards, & Cutler, 2008).

Similarly, tourism is more likely to affect community health. Residents' health condition is also a significant source of information to indicate social QOL (Potter, Cantarero, & Wood, 2012). Health is a commonly mentioned QOL indicator. Higher material QOL also contributes to good health because good material QOL allows individuals access to better nutrition and healthcare. In turn, a healthy condition brings many benefits and improves overall quality of life. For example, good health helps people to access education, job opportunities, productivity, wealth, good social relationships, lower health care cost, and longer life. A typical measurement indicator for good health is life expectancy. HDI, the Healthy Planet Index, and PQLI adopt life expectancy as a basic indicator for measuring QOL.

In tourism QOL research, many scholars have argued that health is an important QOL domain in community and individuals' QOL (Dolnicar, Lazarevski, & Yanamandram, 2013; Kim et al., 2013; McCabe & Johnson, 2013). Some researchers argued that hospitality and tourism experiences affect residents' and tourists' health, improving their QOL (Cini, Kruger, & Ellis, 2013; de Bloom, Geurts, & Kompier, 2013; Filep, 2014; McCabe & Johnson, 2013). In addition, the hospitality and tourism industry provides various leisure opportunities to residents and tourists. Those opportunities not only directly affect individual health and but also indirectly affect residents' social life, affecting social QOL (Mannell, 2007). In health sciences, many health scientists have argued that human's good physical condition is the first condition of happiness. On the community level QOL research, community health can be measured by some health- related QOL indicators such as life expectancy and infant mortality rate of a local community. In the present study, the researcher utilized the life expectancy of the counties in the United States as a proxy variable for measuring residents' health condition and social QOL.

Another important social QOL indicator is the subjective well-being component. In subjective QOL research, life satisfaction is the most important quality of life indicator at the individual level (Andereck & Nyaupane, 2011b; Brülde, 2007; Golant, 2010; Yamada et al., 2011); individuals' QOL is mainly based on subjective perception of their life. In subjective QOL studies, researchers have argued that subjective life satisfaction is the most relevant indicator for QOL. In many cases, individuals' evaluation and interpretation on their life could be a true indicator of their happiness. The present researcher accepted such an argument, combining objective indicators for community living conditions and subjective indicators to measure residents' life satisfaction into one framework to address a subjective dimension of QOL.

The current research used another important social QOL dimension: social connection. The proxy variable for this domain is residents' perception of social and emotional support from others (e.g. friends and family). Many health scientists have argued that social and emotional support has a positive relationship to individuals' health condition and overall QOL (Cohen, 2004; Reblin & Uchino, 2008; Strine, Chapman, Balluz, & Mokdad, 2008; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). They contended that perceptions of social and emotional support are another important indicator for subjective well-being component. Social support has been referred to all resources exchanged through various social relationships like family, friends, and community. Such relationships affect subjective life satisfaction and QOL. To measure residents' perception on social support, the present researcher used data from the Behavioral Risk Factor Surveillance System survey.

Environmental QOL index

Human activities and industries affect the environment because they inevitably consume certain resources. Tourism is also one of the major human activities affecting environmental QOL. To measure environmental QOL at the community level, the present researcher considered various environmental QOL indicators such as water consumption, energy consumption, and Air Quality Index (AQI) of EPA; the present researcher selected AQI as a proxy variable for measuring environmental QOL. According to the indicator selection criteria, it has face validity and comparability over other research settings. AQI is an index, consisting of five major air pollutant indicators: ground-level ozone, particle pollution, carbon monoxide, sulfur dioxide, and nitrogen dioxide. Such pollutants can cause severe health problems. Air pollution may have different sources including volcanoes, windblown dust, factories, power plant, and human activities. Also air pollution is one of the direct environmental outcomes of most human activities. As environmental components are closely linked in an ecosystem, air quality is related to other kinds of environmental quality For example, airborne pollutants from human activities and other natural sources can be deposited back into soil and water bodies, causing degradation of environmental quality (U.S. Environmental Protection Agency, 2001). Such pollutants can be an important contributor to declining water quality (i.e. atmospheric deposition). Therefore, AQI is a good proxy variable for measuring environmental QOL.

In national and community-level QOL research, air quality is an important objective indicator for measuring environmental QOL. For example, OECD has conducted two QOL-related international research projects, "OECD Better Life Index" and "How's Life in Your Region?" (OECD, 2011, 2014). Both projects utilized air quality as an important indicator for constructing a QOL index.

In tourism research, some scholars have argued that AQI is a good objective indicator to measure environmental quality and sustainability at the community level (Choi & Sirakaya, 2006). For example, Choi and Sirakaya (2006) attempted to develop sustainability indicators from a sustainable tourism perspective, identifying six dimensions of community sustainability. They utilized a modified Delphi technique, forming a panel of 38 tourism researchers and generating 128 potential indicators. After refining sustainability indicators, they suggested the most robust indicators for each dimension. For the environmental dimension, the researchers proposed the top three ranked indicators. Among them, AQI was the first ranked indicator for environmental quality and sustainability. Therefore, AQI is a viable indicator for measuring environmental QOL.

However, such an approach also has a limitation. Even though AQI is a comprehensive and direct measurement tool for environmental QOL, the index does not encompass all aspects of environmental QOL. It can mainly cover health-related and residents' perception-related environmental QOL. Yet given that AQI is the most credible environmental QOL indicator at the county level and environmental components closely connected in an ecosystem, AQI can be considered the representative indicator to measure environmental QOL.

2.4 Research model

After combining tourism impact and QOL theories, this present research proposes the following conceptual research model:

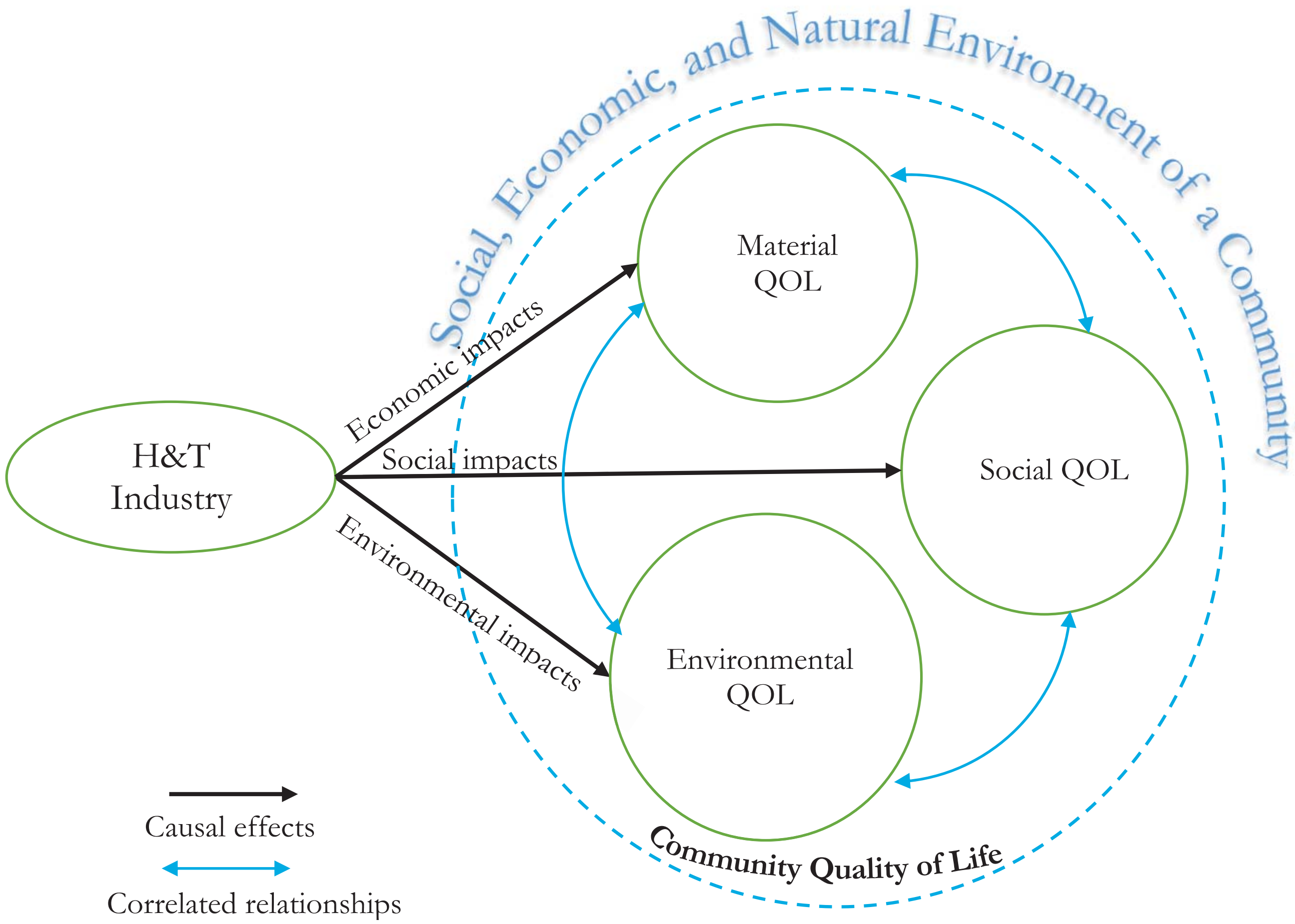

Figure 2-1: Conceptual Research Model of Community Quality of Life

As shown in Figure 2-1, the conceptual model shows that the hospitality and tourism industry affects community QOL in various ways. The community QOL consists of three major QOL components such as material, social, and environmental QOL. Theoretically, they are correlated, demanding a special statistical treatment to consider the correlation among QOL components. Additionally, the model reckons community's social, economic, and natural environment that affects QOL. In the empirical model, such relationships will be estimated simultaneously.

CHAPTER 3. METHODOLOGY

Chapter 3 explains data sources, variable selection criteria, and specific data handling procedures. It also describes the analytical strategies and research models of the present research.

3.1 Database

To analyze the impacts of hospitality and tourism on community quality of life, the present study utilized multiple public use data sources, constructing a new database at the county level by combining them. To fulfil such an objective, the present study adopted Sherrieb's research steps for measuring community level indicators (Sherrieb et al., 2010). The research steps suggest a rigorous data handling procedure at the community level. Accordingly, the first step reviews the relevant literature on measuring quality of life to identify quality of life domains and their potential measurement in tourism research. As described in the previous chapter, three tourism-related quality of life domains were identified. The second step creates a complete list of relevant indicators for the three tourism-related quality of life domains at the community level. The third step identifies data sources that provide relevant indicators for the complete list.

The present research identified some public use data sources that offer key information about living conditions of the selected counties and residents' subjective judgment on their life. The public use data sources originate from the American Community

Survey (ACS), Behavioral Risk Factor Surveillance System (BRFSS), Census County Business Patterns (CBP), the U.S. Environmental Protection Agency (EPA), U.S. Census Bureau's Small Area Income and Poverty Estimates (SAIPE), and USA Counties ™ database.

The ACS is an annual nationwide survey, collecting and producing information about demographic, social, and economic characteristics of American local communities (i.e. counties). That information helps policy makers to distribute funds and to assess public programs. The information includes social, economic, housing, and demographic profiles of local communities. Demographic profiles provide key information about residents' characteristics such as age, gender, race, family, income, benefits, health insurance, education, veteran status, disabilities, work, and expenditure for essentials. Every year, more than 3.5 millions of American households participate in the ACS. It has become a gateway to produce public statistics about communities in the United States.

The BRFSS is an American health survey system conducted since 1984. In 2011, more than half a million of individuals participated in the BRFSS, making it the largest nationwide health survey system in the United States. It collects respondent's life satisfaction and six individual-level behavioral health risk factors: cigarette smoking, alcohol use, physical activity, diet, hypertension, and safety belt use. Currently, the data is collected monthly in all 50 states and American territories. In the present study, the researcher utilized two subjective QOL indicators, residents' life satisfaction and social support from friends and family.

The CBP provides economic statistics for business activities within the sample. counties. It is an annual series of measuring economic activities by specific industries in the United States. These economic activities contain the number of establishments, employment, and annual payroll by the 6-digit North American Industry Classification System (NAICS) code. The CBP is the only annual source for the complete county-level data in the United States. Therefore, it is the foundation for various county-level studies.

The United States Environmental Protection Agency (EPA) offers Air Quality Index (AQI), measuring air quality at the state and county levels. AQI provides information about health-related air quality information of American counties. The index is calculated by five major air pollutants: ground-level ozone, particle pollution, carbon monoxide, sulfur dioxide, and nitrogen dioxide (U.S. Environmental Protection Agency, 2009). It is reported that such major pollutants can cause health problems. In the present study, the researcher used AQI as a proxy variable for indicating environmental QOL.

SAIPE generates annual data for income and poverty statistics of all American school districts, counties, and states. The data includes the number of people in poverty, the number of children under age 5 in poverty, the number of related children ages 5 to 17 in families in poverty, the number of children under age 18 in poverty, and median household income. Such information is the basis for measuring material QOL or economic prosperity in a community. Many social science studies have used such information. In the present study, the researcher utilized two major material QOL-related items, household median income and poverty rate at the county level.

USA Counties ™ is a meta-database that provides all of the data published for American counties from the U.S. Census Bureau and other federal agencies (e.g. the Bureau of Economic Analysis, the Bureau of Labor Statistics, the Federal Bureau of Investigation, the Internal Revenue Service, and the Social Security Administration). The database also obtains key data items from national surveys such as the American Community Survey

(ACS) and U.S. Census Bureau's Small Area Income and Poverty Estimates (SAIPE). The database has served as a gateway for community-level social science studies.

To produce a new community-level QOL database, the present researcher applied a data merging technique on such datasets and survey results, combining the datasets using the Federal Information Processing System (FIPS) code. All community level datasets of 2008 were downloaded from previously identified data sources. Using Stat/Transfer 9 – data format transport software – the downloaded data was transported into a Stata data format. Then the researcher used the data merge functionality of Stata, connecting QOL information from the various data sources and generating a new data framework. In this process, all the county level information was coordinated by the FIPS county code, a unique identifier of counties and county equivalents in the United States. Among 3,142 American counties, 775 were included in the community-level QOL database because these counties have all QOL indicators; environmental QOL information was available only for such counties. However, 234 million people of the United States live in the counties; the sample covers most of the American population.

3.2 Variables

3.2.1 Dependent variables

The dependent variables used for the present research are QOL indices representing key QOL domains at the county level. To build the QOL indices for such QOL domains, the researcher performed a two-step index building procedure. The first step selected relevant QOL indicators corresponded to QOL domains as shown in Table 2-3. The second step conducted Principal Component Analysis (PCA) on the selected QOL indicators to produce a composite index to indicate a specific QOL level. For example, if the indicators are frequently used in the existing QOL literature and appropriately describe the quality of life domains, the researcher can determine that the indicators are relevant for QOL index building. Then the researcher conducted PCA on relevant QOL indicators, constructing a composite index for each QOL domain. Table 3-1 summarizes three QOL domains, their indicators, and information sources.

Table 3-1: Complete List of QOL Indicators for Quality of Life Domains

Quality of Life Domain Index	Social Indicators	Sources
Material QOL	Median household income	BEA
	Poverty rate	SAIPE
	Unemployment rate	ACS
Social QOL	Total crime rate	USA Counties
	Educational attainment	ACS
	Life expectancy	ACS
	Voter turnout rate	USA Counties
	Average life satisfaction of residents	BRFSS
	Social and emotional support	BRFSS
Environmental QOL	Air Quality Index	EPA

As reviewed in Chapter 2, the researcher categorized the tourism-related QOL construct into three QOL sub-domains based on the theories of tourism impacts and tourism-related QOL. Accordingly, tourism impacts include those that are economic, social, and environmental. Such impacts make differences in the QOL level between communities. The differences belong to the material QOL, social QOL, and environmental QOL domains based on their characteristics.

The material QOL index is a composite index showing a current level of material QOL at the county level. To build the material QOL index, the researcher utilized some representative material QOL indicators such as the average household income, poverty rate, and unemployment rate of the sample counties. As described in Chapter 2.3.3, they are relevant indicators to build the material QOL index. For example, income is one of the most widely used social indicators for measuring material QOL (Diener & Biswas-Diener, 2002; Pouwels, Siegers, & Vlasblom, 2008; Sirgy et al., 2000). Stable income enables residents to acquire what residents need for daily living. Therefore, income has been a key variable to measure material QOL in many QOL studies. In consumer theory, income is the most important variable to determine consumers' demand because income limits consumers' budget to acquire products and/or services that they need. Poverty rate and unemployment rate are also important indicators for measuring material QOL at the community level; they are direct indicators of economic conditions of county households.

As mentioned in 2.3.3, the social QOL index is a combination of key social indicators: education, health, civic engagement, life satisfaction, social connection, and safety. They are popular indicators to measure QOL at the community and individual level in QOL research. According to PCA results, social QOL indicators cover three social QOL sub-domains: overall social QOL, subjective social QOL, and safety-related QOL. In the present research each sub-domain is considered a dependent variable in the research models.

To measure the environmental QOL domain, the present researcher used the Air Quality Index (AQI) from the EPA because AQI can be a proxy variable for measuring environmental QOL. Human activities and industries consume certain environmental resources, affecting the environment. Tourism is also one of the major human activities affecting environmental QOL (Gladstone et al., 2013; Hsieh & Kung, 2013; Saenz-de-Miera & Rosselló, 2014). Among various environmental indicators, air quality is a commonly used indicator because air pollution could directly affect human health and subjective quality of life. However, air pollution could originate from many different sources such as volcanoes, windblown dust, factories, power plants, and other human activities. Air quality can be affected by the pollution in various ways. Among pollution sources, human activities are considered one of the primary sources for air pollution. In tourism impact research, some scholars have argued that tourism could negatively affect air quality (Hsieh & Kung, 2013; Saenz-de-Miera & Rosselló, 2014) because tourism impacts – a type of major human activities - could be an important factor in the degradation of the local environment such as air pollution. However other scholars object to such an argument (J. W. Lee & Brahmasrene, 2013).

AQI is also a composite index consisting of five major air pollutant indicators: ground-level ozone, particle pollution, carbon monoxide, sulfur dioxide, and nitrogen dioxide. Reportedly, they are related to the human health conditions.

3.2.2 Independent variables

The independent variables consist of industry economic activity variables and community characteristics variables. Their descriptive statistics are summarized in Table 3-2.

Table 3-2: Descriptive Statistics of Independent Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Business Establishments per capita					
NAICS 11	2,707	0.299	0.471	0.001	5.076
NAICS 21	2,427	0.373	0.863	0.001	11.272
NAICS 22	2,828	0.178	0.231	0.003	2.930
NAICS 23	3,127	2.866	1.870	0.130	23.629
NAICS 31	3,075	1.145	0.603	0.058	7.246
NAICS 42	3,086	1.132	0.754	0.073	6.623
NAICS 44	3,133	4.098	1.619	0.492	25.362
NAICS 48	3,103	1.044	0.793	0.073	14.690
NAICS 51	3,031	0.429	0.293	0.027	3.571
NAICS 52	3,122	1.533	0.733	0.073	7.885
NAICS 53	3,022	0.914	0.732	0.070	13.571
NAICS 54	3,112	1.768	1.289	0.084	27.428
NAICS 55	2,199	0.132	0.139	0.011	3.051
NAICS 56	3,043	0.940	0.602	0.076	9.897
NAICS 61	2,554	0.225	0.172	0.020	2.959
NAICS 62	3,117	2.276	0.974	0.218	14.620
NAICS 71	2,991	0.465	0.457	0.016	9.058
NAICS 72	3,132	2.235	1.670	0.123	39.855
NAICS 81	3,128	2.652	1.083	0.259	10
Rural-Urban Continuum Codes: code 1 (metro) ~9 (non-metro)					
rururb2003	3,142	5.128	2.683	1	9
County Typology Codes					
Farm-based	3,142	14.0%	0.347	0	1
Mine-based	3,142	4.1%	0.198	0	1
Manufacturing-based	3,142	28.8%	0.453	0	1
Fed/State-government	3,142	12.1%	0.326	0	1
Service-based	3,142	10.8%	0.311	0	1
Unspecialized county	3,142	30.2%	0.459	0	1
Tourism and leisure related					
Non-metro recreation	3,142	10.6%	0.308	0	1
Retirement destination	3,142	14.0%	0.347	0	1

Hospitality and tourism industry variables

The strength of local industry sectors is the basis of economic prosperity in any community. The number of industry establishments could reflect both industry strength and business activities in a community. Local establishments generally meet local customers' needs by providing products and/or services that members of the community want. Industry establishments are also important sources of employment opportunities and tax revenue.

In the present study, the researcher defined the number of establishments of NAICS 71 and NAICS 72 per capita within the sample counties as the strength of the H&T industry and business activities in a local economy (Baade & Matheson, 2007). According to the U.S. Bureau of Labor Statistics, both NAICS sectors are categorized as "the leisure and hospitality supersector" (Henderson, 2012), forming a basis for the tourism system. NAICS 71 includes the Arts, Entertainment, and Recreation sectors, which contain a wide range of leisure, tourism, and cultural industry establishments. NAICS 72 includes the accommodations and food service sectors. As the researcher indicated previously in Chapter 2.1.1, products and/or services that local industry establishments provide are crucial sources of social utility. Therefore, the number of establishments in a community is an important independent variable to affect community QOL.

Other industry variables

In the current study, the researcher paid attention to the limitation of existing tourism impact research. Generally, most tourism impact research focuses on only the impacts of the tourism industry on a local community and its residents rather than the impacts of all economic activities on research subjects. However, in community QOL research, some scholars contend that various factors could affect community QOL, trying to include all factors into research models. In tourism research, such a viewpoint is also reasonable because tourism is one of the major components of human activities. Tourism impacts partially contribute to the overall impacts of human activities of society. For example, even though the hospitality and tourism industry provides huge employment opportunities in the United States, the industry sector accounts for approximately ten percent of total national employment. Ninety percent of employment is comprised of the other industry sectors. Therefore, other industry variables need to be included as control variables to analyze the impacts of tourism on a local community and its residents.

In the present research, the number of establishments of other industries per capita is used as a control variable to precisely analyze the impacts of hospitality and tourism on community QOL. To the author's best knowledge, such practice is a new approach in tourism impact research. The other industries include all industries such as NAICS 11 (Agriculture, Forestry, Fishing and Hunting), NAICS 21 (Mining, Quarrying, and Oil and Gas Extraction), NAICS 22 (Utilities), NAICS 23 (Construction), NAICS 31 (Manufacturing), NAICS 42 (Wholesale Trade), NAICS 44 (Retail Trade), NAICS 48 (Transportation and Warehousing), NAICS 51 (Information), NAICS 52 (Finance and Insurance), NAICS 53 (Real Estate Rental and Leasing), NAICS 54 (Professional, Scientific, and Technical Services), NAICS 55 (Management of Companies and Enterprises), NAICS 56 (Administrative and Support and Waste Management and Remediation Services), NAICS 61 (Educational Services), NAICS 62 (Health Care and Social Assistance), and NAICS 81 (Other Services).

Community characteristics

In rural sociology, scholars consider community characteristics as an important factor to affect community residents' QOL (Aronson, Pulver, & Buse, 1985; Perdue et al., 1999; Raphael et al., 2001). In the present study, the researcher includes several key community characteristic variables such as the Rural-Urban Continuum Codes (RUCC) and County Typology Codes (CTC). RUCC is a classification system to distinguish American counties by population size and degree of urbanization. It could reflect the rurality of all U.S. counties, assigning codes that range from one (metro) to nine (non-metro) classification. CTC categorizes the counties by their economic dependence on specific local industries and their social characteristics: farming, mining, manufacturing, services, Federal/State government, and unspecialized counties. As hypothesized, local economic structure affects community QOL. Moreover, the researcher added two additional categories - recreation county and retirement destination – as county indicators.

3.3 Statistical tools

To test the research hypotheses, various statistical techniques and estimation models were proposed. The study mainly used two categories of data analysis techniques. The first was to construct QOL indices (i.e. dependent variables). The other was to investigate the hypothetical relationships among dependent and independent variables. To acquire accurate estimation results, OLS, SUR and SUE models were used. Then estimation results were compared.

3.3.1 Principal component analysis

To construct QOL indices, the researcher used Principal Component Analysis (PCA). It is a multivariate statistical analysis tool used to identify underlying dimensions of a data set, reducing the number of variables in the original data into a smaller number of information components. In social science, researchers often identify underlying constructs of social phenomena using multiple measurement indicators. Generally, such indicators are proposed from a conceptual framework and scholars test their usability by empirical research. Research results often reported that the indicators may deal with multidimensional aspects of observed variables, producing a complex information structure. Therefore, simplification is needed because a small set of uncorrelated variables is easier to analyze than complex and correlated variables (Dunteman, 1989). Among various statistical tools for such a research purpose, PCA is a specialized statistical tool to simplify the information structure.

In terms of a variable reduction, the goal of PCA is similar to the objective of Factor Analysis (FA). However, PCA is quite different from FA because they have a different research focus. For example, PCA intends to reveal principal components, explaining total variation in observed variables. Therefore, such components could be an index to indicate the variation. Contrary to PCA, FA investigates a variance structure to distinguish common and unique variance, revealing correlations between the common variance and variables' variance.

In many social science areas, PCA has been used in constructing a composite index including objective and subjective measurements (Maggino & Zumbo, 2012). In mathematical terms, PCA generates uncorrelated components using a linear combination of the original variables. Each coefficient of variables is a calculated weight, indicating how each variable contributes to building a composite variable. For example, if there is a data set of *p* variables and *m* principal components, it can be expressed as follows:

$$PC_1 = a_{11}X_1 + a_{12}X_2 + \ldots\ldots + a_{1p}X_p \quad (3\text{-}1)$$

.

.

$$PC_m = a_{m1}X_1 + a_{m2}X_2 + \ldots. + a_{mp}X_p$$

where a_{mp} indicates the weight of *p*th variable with respect to *m*th principal component.

More specifically, the variance of a linear composite of $\sum_{i=1}^{p} a_i x_i$ can be expressed as follows:

$$\sum_{i=1}^{p}\sum_{j=1}^{p} a_i a_j \sigma_{ij} \quad (3\text{-}2)$$

where σ_{ij} indicates the covariance between the *i*th and *j*th variables. This is a generalized form of variance among variables. If p is 2 (i.e. two variable case), the composite equation can be expressed as $y = a_1x_1 + a_2x_2$, its variance is $a_1^2\sigma_1^2 + a_2^2\sigma_2^2 + 2a_1a_2\sigma_{12}$.

The variance of a linear composite can be expressed as a matrix algebra form like $a'Ca$. In this form, a indicates the vector of weights of variables; C is the covariance matrix of variables. PCA enables researchers to determine the combination of weight vector a to maximize the variance of a linear composite given the constraint condition that

$$\sum_{i=1}^{p} a_i^2 = a'a = 1 \quad (3\text{-}3)$$

The vectors of variable weights for each principal component are obtained by the eigenvectors of the correlation matrix. The obtained components are ordered by its variance of each principal component. Thus, the first principal component explains the largest portion of variation in the original data; subsequent components explain less variation than the first principal component.

To decide the number of principal components is another important issue in PCA. Kaiser (1960) suggested some criteria (i.e. rule of thumb) to determine the number of principal components, recommending to drop those principal components with variances less than one. Such components have less information than a single standardized variable (Dunteman, 1989; Kaiser, 1960).

3.3.2 SURE model

As shown in Figure 2-1, the present researcher assumed that the sub-domains of community QOL are correlated. To acquire accurate estimates, such a relationship should be considered in a statistical model. The Seemingly Unrelated Regression (SURE) model and Seemingly Unrelated Estimation (SUE) model are an equation system model to reflect the relationships, providing robust statistical results. The SURE model consists of several conditions. For example, suppose there are m regression equations, they seem to be unrelated. However, error terms are independent over time, but they may have cross-equation contemporaneous correlations. Statistically, the SURE model is described as follow:

$$y_i = X_i \beta_i + \varepsilon_i, \qquad i = 1, \ldots, k \tag{3-4}$$

where,

$$\varepsilon = [\varepsilon_1', \varepsilon_2', \dots, \varepsilon_k']' \tag{3-5}$$

The SURE model is based on two assumptions: strict exogeneity of X_i and homoscedasticity. Such assumptions are indicated accordingly:

For the strict exogeneity assumption:

$$\mathrm{E}[\varepsilon | X_1, X_2, \dots X_K] = 0 \tag{3-6}$$

For the homoscedasticity assumption:

$$\mathrm{E}[\varepsilon_k \varepsilon_k' | X_1, X_2, \dots, X_K] = \sigma_{ij} \mathrm{I}_T \tag{3-7}$$

Disturbances are assumed to be uncorrelated across observations, but correlated across equations. Therefore,

$$\mathrm{E}\left[\varepsilon_{it}\varepsilon_{js} | X_1, X_2, \dots, X_K\right] = \sigma_{ij}, \qquad if\ t = s\ and\ 0\ otherwise. \tag{3-8}$$

The disturbance formulation is, therefore,

$$\mathrm{E}\left[\varepsilon_i \varepsilon_j' | X_1, X_2, \dots, X_K\right] = \sigma_{ij}\mathrm{I}_T = \Omega = \begin{bmatrix} \sigma_{11}\mathrm{I} & \sigma_{12}\mathrm{I} & \dots & \sigma_{1k}\mathrm{I} \\ \sigma_{21}\mathrm{I} & \sigma_{22}\mathrm{I} & \dots & \sigma_{1k}\mathrm{I} \\ & \vdots & & \\ \sigma_{k1}\mathrm{I} & \sigma_{k2}\mathrm{I} & \dots & \sigma_{kk}\mathrm{I} \end{bmatrix} \tag{3-9}$$

In the SURE model, the coefficient estimators are obtained by generalized least squares (GLS) estimation. In the model, the K x K covariance matrix of the disturbances is

$$\Sigma = \begin{bmatrix} \sigma_{11} & \sigma_{12} & \dots & \sigma_{1k} \\ \sigma_{21} & \sigma_{22} & \dots & \sigma_{1k} \\ & \vdots & & \\ \sigma_{k1} & \sigma_{k2} & \dots & \sigma_{kk} \end{bmatrix} \tag{3-10}$$

So,

$$\Omega = \Sigma \otimes \mathrm{I} \tag{3-11}$$

And,

$$\Omega^{-1} = \Sigma^{-1} \otimes \mathrm{I} \tag{3-12}$$

The GLS estimator is

$$\hat{\beta} = [X'\Omega^{-1}X]^{-1}X'\Omega^{-1}y = [X'(\Sigma^{-1} \otimes \mathrm{I})X]^{-1}X'(\Sigma^{-1} \otimes \mathrm{I})y \tag{3-13}$$

By the Kronecker products (i.e. $\otimes$), the estimators can be expressed:

$$\hat{\beta} = \begin{bmatrix} \sigma_{11}X_1'X_1 & \sigma_{12}X_1'X_2 & \dots & \sigma_{1k}X_1'X_k \\ \sigma_{21}X_2'X_1 & \sigma_{22}X_2'X_2 & \dots & \sigma_{2k}X_2'X_k \\ & \vdots & & \\ \sigma_{k1}X_k'X_1 & \sigma_{k2}X_k'X_2 & \dots & \sigma_{kk}X_k'X_k \end{bmatrix}^{-1} \begin{bmatrix} \sum_{j=1}^{k} \sigma_{1j}X_1'y_j \\ \sum_{j=1}^{k} \sigma_{2j}X_2'y_j \\ \vdots \\ \sum_{j=1}^{k} \sigma_{kj}X_k'y_j \end{bmatrix} \tag{3-14}$$

3.3.3 SUE model

Even though the SURE model is suitable for estimating coefficients of an equation system simultaneously, the model may have some limitations if the SURE model's basic assumptions (i.e. homoscedasticity) are violated. As the present research utilized cross-sectional data, the homoscedasticity assumption is more likely to be violated. Therefore, alternative estimation methods would be required for estimating an equation system. Regarding the heteroscedasticity issue, Weesie (1999) proposed Seemingly Unrelated Estimation (SUE). SUE is a special application of the Sandwich Estimator, which is robust in a heteroscedasticity situation. The basis of SUE is to estimate the co-variance matrix simultaneously by the Sandwich Estimation technique. In econometric the estimator $\hat{\beta}_i$ is defined as the solution of the estimation equation G_i,

$$G_i(b_i) = \sum w_{ij} u_{ij}(b_i) = 0, \quad i = 1, \dots, k \qquad (3\text{-}15)$$

Under suitable regularity conditions, the $\hat{\beta}_i$ are asymptotically normally distributed and the variance of the Sandwich Estimator is as follows:

$$V_i = Var(\hat{\beta}_i) = D_i^{-1} \sum_j w_{ij} u_{ij} u'_{ij} \, D_i^{-1} \qquad (3\text{-}16)$$

Where D_i is the Jacobian of G_i.

To acquire the simultaneous distribution of the sandwich estimators, the researcher used the "stacked" estimation equation, which can be expressed as:

$$\mathrm{G}(\hat{\beta}) = \{G_1(\hat{\beta}_1), G_2(\hat{\beta}_2), \ldots\ldots, G_k(\hat{\beta}_k)\}=0 \tag{3-17}$$

Under the "suitable regularity condition", $\hat{\beta}$ is asymptotically and joint normally distributed. The Jacobian of the simultaneous equation, G, is as follows:

$$\mathrm{D}(\hat{\beta}) = \frac{dG(\beta)}{d\beta}\Big|_{\beta=\hat{\beta}} \tag{3-18}$$

The Sandwich estimator for the asymptotic variance of $\hat{\beta}$ is:

$$\mathrm{V} = \mathrm{Var}(\hat{\beta}) = D(\hat{\beta})^{-1}\left(\sum_j w_j u_j u_j'\right) D(\hat{\beta})^{-1} \tag{3-19}$$

One can also obtain the Sandwich-type estimate of the covariance V_{ih} between $\hat{\beta}_i$ and $\hat{\beta}_h$. The estimate is as follows:

$$V_{ih} = Cov(\hat{\beta}_i, \hat{\beta}_h) = D_i^{-1} \sum_j w_j u_{ij} u_{ih}' \, D_h^{-1} \tag{3-20}$$

SUE is a process of acquiring the Sandwich-type estimators to test cross-equation hypotheses. However, its application is limited to the case of a SURE model that has the same independent variables over the equations. Generally, such a case is very rare in practical analysis. Hayashi (2011) said that applying ML estimation to the SURE model would be a viable option to utilize the strength of both SURE and SUE model, generalizing simultaneous estimation methods.

3.4 Data analysis procedure and the models

The present research follows the data analysis procedures and adopted combinations of PCA and SURE/SUE model estimation. This research consists of two main procedures. The first is to generate community level QOL database by merging multiple public use data sets. The second is to analyze the generated QOL database. More specific explanation is described in the following sections.

3.4.1 Data handling procedure

To utilize public domain data sets, the researcher identified data archive locations and downloaded multiple public domain data from these online locations. The locations are presented in Table 3-3.

Table 3-3: Data Sources

Sources	Online data locations
ACS	http://www.census.gov/acs/www/data_documentation/data_main/
BRFSS	http://www.cdc.gov/brfss/
CBP	http://www.census.gov/econ/cbp/
EPA	http://airnow.gov/index.cfm?action=aqibasics.aqi
SAIPE	http://www.census.gov/did/www/saipe/about/index.html
USA Counties™	http://www.census.gov/support/USACdataDownloads.html#EDU

As downloaded data sets were coded by various data formats, the researcher transformed the data sets by StatTransfer 9, a data transfer utility, converting them into a Stata data format. In Stata 13, all transformed data sets were merged by Federal Information

Processing System (FIPS), a unique identifier of counties in the United States. The generated database includes all information about the sample counties such as business activity information, county economic conditions, social indicators, and environmental quality indices. The information was used to generate economic, social, and environmental QOL indexed by Principle Component Analysis (PCA). PCA is a statistical tool for revealing a data structure, reducing data dimensions.

To measure all industry impacts in the sample counties, the statistics of all business establishment by NAICS code were used. The number of business establishments by NAICS was derived from the County Business Pattern. The number was standardized by the formula of:

Standardized business activities = # of establishments / per 1000 inhabitants

3.4.2 Analytical procedure

The present researcher conducted OLS, OLS with robust standard error, SURE, SUE, and SURE models with Maximum Likelihood estimation (ML). Initially, OLS was used to check data quality by testing basic OLS assumptions. Because this study utilized a large sample cross-sectional data set, VIF and heteroscedasticity tests were performed.

With results of the OLS assumption tests, the author proposed alternative estimation methods, suggesting the best estimation method to overcome limitations of existing estimation models.

3.4.3 Empirical model

As mentioned in Chapter 2.1.1, community QOL is a function of social utility. The following reflects the conceptual model of community QOL:

$$QOL_i = f(c_1, \dots., c_m) \qquad (3\text{-}21)$$

where QOL_i is a linear combination of QOL indicators by Principal Component Analysis, indicating level of QOL of a county k.

c_j = Measure of business activities - a source of products and services available in a county k.

The present researcher considered an individual county's social and economic characteristics as reflected:

$$QOL_i = f(c_1, \dots., c_m, T) \qquad (3\text{-}22)$$

T represents county's social and economic characteristics that affect community quality of life.

The conceptual function can been transformed by the Cobb-Douglas functional form, constructing a community QOL function.

$$QOL_i = \beta_{i0} c_1^{\beta_{i1}} c_2^{\beta_{i2}} \dots.. c_m^{\beta_{im}} T^{\beta_{iz}} \qquad (3\text{-}23)$$

This QOL function can be transformed into a linear form.

$$ln\ QOL_i = \beta_{i0} + \beta_{i1}\ln(c_1) + \beta_{i2}\ln(c_2) \ldots .. + \beta_{im}\ln(c_m) + \beta_{iz}T \qquad (3\text{-}24)$$

More specifically, c_m indicates a measure of business activities (i.e. the number of business establishments per capita by NAICS codes) and T is an indicator variable of county's geographical, societal, and economic characteristics: the Rural-Urban Continuum Code (i.e. Rurality index), farm-dependent county, mining-dependent county, federal/state government-dependent county, services-dependent county, non-metro recreation county, and retirement destination county, and rural index. The linear form of community QOL function is an empirical model for basis of OLS, SURE, a multivariate regression with SUE estimation, and SURE with ML estimation. The final model to be estimated can be written as follows:

$$lnQOL_i = \beta_{i0} + \beta_{i1}\ln(c_1) + \beta_{i2}\ln(c_2) \ldots .. + \beta_{im}\ln(c_m) + \beta_{iz}T + e_i \qquad (3\text{-}25)$$

$$i = 1, \ldots 5$$

Where,

QOL_1= material QOL index at the county level;
QOL_2= social QOL 1 index at the county level;
QOL_3= social QOL 2 index at the county level;
QOL_4= social QOL 3 index at the county level;
QOL_5= environmental QOL index at the county level;

c1= NAICS11= (number of establishments of the Agriculture, Forestry, Fishing and Hunting Sector in county k)/(k county's population/1000)
c2= NAICS21= (number of establishments of the Mining Sector in county k)/(k county's population/1000)
c3= NAICS22= (number of establishments of the Utilities Sector in county k)/(k county's population/1000)
c4= NAICS23= (number of establishments of the Construction Sector in county k)/(k county's population/1000)
c5= NAICS31= (number of establishments of the Manufacturing Sector in county k)/(k county's population/1000)

c6= NAICS42= (number of establishments of the Wholesale Trade Sector in county k)/(k county's population/1000)
c7= NAICS44= (number of establishments of the Retail Trade Sector in county k)/(k county's population/1000)
c8= NAICS48= (number of establishments of the Transportation and Warehousing Sector in county k)/(k county's population/1000)
c9= NAICS51= (number of establishments of the Information Sector in county k)/(k county's population/1000)
c10= NAICS52= (number of establishments of the Finance and Insurance Sector in county k)/(k county's population/1000)
c11= NAICS53= (number of establishments of the Real Estate Rental and Leasing Sector in county k)/(k county's population/1000)
c12= NAICS54= (number of establishments of the Professional, Scientific, and Technical Services Sector in county k)/(k county's population/1000)
c13= NAICS55= (number of establishments of the Management of Companies and Enterprises Sector in county k)/(k county's population/1000)
c14= NAICS56= (number of establishments of the Administrative and Support and Waste Management and Remediation Services Sector in county k)/(k county's population/1000)
c15= NAICS61= (number of establishments of the Educational Services Sector in county k)/(k county's population/1000)
c16= NAICS62= (number of establishments of the Health Care and Social Assistance Sector in county k)/(k county's population/1000)
c17= NAICS71= (number of establishments of the Arts, entertainment, and recreation Sector in county k)/(k county's population/1000)
c18= NAICS72= (number of establishments of the Accommodation and food services Sector in county k)/(k county's population/1000)
c19= NAICS81= (number of establishments of the Other Services Sector in county k)/(k county's population/1000)
T1 = log of Rural-Urban Continuum Code (a proxy variable for rurality)
T2 = dummy variable of a farm-dependent county indicator
T3 = dummy variable of a mining-dependent county indicator
T4 = dummy variable of a manufacturing-dependent county indicator
T5 = dummy variable of a federal/State government-dependent county indicator
T6 = dummy variable of a services-dependent county indicator
T7 = dummy variable of a non-metro recreation county indicator
T8 = dummy variable of a retirement destination county indicator
T9 = dummy variable of a mega-city indicator[+]
T10 = dummy variable of a natural factor variable in the environmental QOL model[+]

[+] Environmental QOL model only

3.4.4 Hypotheses

The empirical research model is designed to test the impacts of the hospitality and tourism industry as well as community's social and economic characteristics on community QOL. More detailed research hypotheses are as follows:

Hypotheses 1-A and 1-B: Material QOL

H1-A: The hospitality and tourism industry affects the material QOL domain of community quality of life.

H1-B: Community characteristics affect the material QOL domain of community quality of life.

Hypotheses 2-A and 2-B: Social QOL

H2-A: The hospitality and tourism industry affects the social QOL domain of community quality of life.

H2-B: Community characteristics affect the social QOL domain of community quality of life.

Hypotheses 3-A, 3-B, and 3-C: Environmental QOL

H3-A: The hospitality and tourism industry affects the environmental QOL domain of community quality of life.

H3-B: Community characteristics affect the environmental QOL domain of community quality of life.

H3-C: Outlier factors affect the environmental QOL domain of community quality of life.

Hypothesis 4-A: Interrelationships among QOL domains

H4-A: All QOL domains are interrelated.

CHAPTER 4. RESULTS

The present chapter provides descriptive information about samples and statistical results of data analysis. The first section describes basic statistics of the research samples. The second section presents Principal Component Analysis (PCA) results to construct dependent variables in the research model. The third evaluates estimation methods and analytical strategies by checking OLS assumptions. In the fourth, statistical results of research models are presented so that the researcher can assess usefulness and robustness of each estimation method. In the fifth, based on the model assessment, the researcher selects the optimal estimation method to test hypotheses. Finally, the researcher statistically tests the hypotheses, providing new findings.

4.1 Descriptive information of samples

Descriptive information about the counties in the United States gives tourism researchers a broad perspective about residents' living conditions and community quality of life. In the present study, the descriptive information dealt with economic, social, and environmental dimensions of community quality of life. Table 4-1 provides the detailed.

Table 4-1: Descriptive information of sample counties

	Obs	Mean	Std. Dev	Min	Max
Economic indicators					
Average household income	3,137	44,168.66	11,461.54	19,182	111,582
Unemployment rate	3,140	5.78	2.10	1.30	22.40
Poverty rate	3,139	15.23	6.07	0	54.40
Social indicators					
Population estimates	3,140	96,833	312,180	42	9,862,049
Education (college or graduate degree holder rate)	3,138	19.48	8.77	3.70	72.80
Average life expectancy	3,142	77.15	2.02	70.40	83.00
Vote cast for president in 2008	3,139	41674.18	119,405.1	79	3,318,248
Average life satisfaction (1-4)	2,239	3.39	0.12	2.60	4.00
Average perception about emotional supports from friends and family (1-5)	2,239	4.18	0.22	2.33	5.00
Safety rate (1-crime rate)	3,138	.98	0.02	0.71	1.00
Rural-urban continuum code (1 to 9)	3,142	5.13	2.68	1.00	9.00
Environmental indicator					
Good air quality rate (days of good AQI/total AQI days)	1,055	.76	0.18	0.003	1.00

Regarding economic indicators, the average household income of sample counties is the most important information source of material QOL. The mean value is \$ 44,168.66. The lowest is \$ 19,182 (FIPS: 46017 Buffalo County, SD), and the highest is \$111,582 (FIPS: 51107 Loudoun County, VA). The highest is five time more than the lowest. For the unemployment rate of the sample counties, the mean value is 5.78%. The lowest is 1.3% (FIPS: 38087 Slope County, ND), and the highest is 22.4% (FIPS: 06025 Imperial County, CA). Poverty rate is another indicator to describe the economic conditions of sample counties. Table 4-1 shows that the mean value of the average poverty rate is 15.23%. The lowest is 0% (FIPS: 15005 Kalawao County, HI), and the highest is 54.4% (FIPS: 46137 Ziebach County, SD).

Concerning social indicators, the basic information is the number of residents in American counties; the average population of the sample counties is 96,833. The minimum number of resident total population estimate is 42 (FIPS: 48301 Loving County, TX), and the maximum number of population is 9,862,049 (FIPS: 06037 Los Angeles County, CA). Regarding the educational achievement rate in the sample counties, the researcher paid attention to the population of college or graduate degree holders. The descriptive information indicates that such a population accounts for 19.48% of the population in the United States. The lowest is 3.7% (FIPS: 48301 Loving County, TX), and the highest is 72.8% (FIPS: 51610 Falls Church city[1], VA).

The average life expectancy of sample counties is also an important indicator of QOL because all surroundings and individual life conditions ultimately affect their health conditions, affecting average life expectancy. According to the results, the average life expectancy of sample counties is 77.15 years. The lowest is 70.40 years (FIPS: 28119 Quitman County, MS), and the highest is 83.0 years (FIPS: 12021 Collier County, FL).

Voter turnout rate is a meaningful indicator to evaluate civic engagement. Descriptive information indicates that the average number of votes cast for the president election in 2008 is 41674.18 per county. The lowest is 79 (FIPS: 48301 Loving County, TX), and the highest is 3,318,248 (FIPS: 06037 Los Angeles County, CA).

---

[1] Fall Church city is an independent city with county-level governance status.

The mean score of life satisfaction explains the subjective well-being component. This indicator is a Likert-type indicator, measuring resident life satisfaction by four different levels of life satisfaction (i.e. 1 less satisfied, 4 very satisfied). The average life satisfaction of the counties is 3.39. The lowest is 2.6 (FIPS: 17181 Union County, IL), and the highest is 4.0 (FIPS: 51520 Bristol city, VA; FIPS: 48253 Jones County, TX).

Another important social indicator at the individual level is residents' perception of social and emotional support from family and friends. The perception was measured by five different levels of social support from others (i.e. 1 none, 5 many times). The average score of residents' perception is 4.18. The lowest is 2.6 (FIPS: 48161 Freestone County, TX), and the highest is 5.0 (FIPS: 48487 Wilbarger County, TX; FIPS: 17149 Pike County, IL; FIPS: 48351 Newton County, TX; FIPS: 13251 Screven County, GA; FIPS: 48253 Jones County, TX).

Regarding safety, the present study used the overall crime rate of each county as the source of information. Social safety is defined as follows: 1- crime rate (total crime rate per capita/1000). Average safety rate is 0.98. Rural-urban continuum code was used to reflect the social and geographical characteristics of the counties. From 1 to 3 is considered urban areas and more than 4 is considered rural areas. The average code is 5.13.

Lastly, AQI was selected as an indicator to measure environmental QOL. To standardize AQI information, the researcher converted AQI into the rate of good air quality days. The average rate is .76. The lowest is 0.273% (FIPS: 15001 Hawaii County, HI), due to the eruption of Kilauea Volcano. Thirty counties reported 100% of the average good air quality rate. However, such information is the least available of sample counties because EIA provide only 1,055 of American counties.

4.2 Statistical results

As explained in Chapter 3.4, the analytical procedure consisted of two steps of statistical analysis. The first constructed QOL indices using PCA results. The next estimated tourism impact models on community QOL. The following sections present results for each statistical analysis.

4.2.1 PCA results

According to tourism impact theories, the hospitality and tourism industry affects society in three ways: economic, social, and environmental impacts. Therefore, impacts on community QOL also could be conceptualized as the impacts on material (i.e. economic), social, and environmental QOL domains. The researcher measured such impacts using QOL indices of sample counties. Principal Component Analysis (PCA) is a well-known statistical technique for constructing an index. PCA is a variable-reduction technique, providing a systematical way to reduce a large number of variables into smaller sets of variables. The set is called a principal component, the basis for constructing an index. It is generated by a linear combination of original variables.

Table 4-2 and Table 4-3 show PCA results of a material QOL index. Table 4-2 presents the eigenvalues of a correlation matrix of material QOL indicators. Table 4-3 displays the loadings of the indicators with the principal component. According to results, the material QOL index has one meaningful PCA component, producing a uni-dimensional index. The eigenvalue of the PCA component is 2.09 and accounts for 70% of total variance. Table 4-3 displays eigenvectors of a rotated component of material QOL indicators. Such information was utilized to produce the material QOL index as shown in Equation (4-1).

Table 4-2: Eigenvalues of a Correlation Matrix of Material QOL Indicators

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.09	1.37	0.70	0.70
Comp2	0.73	0.55	0.24	0.94
Comp3	0.18	.	0.06	1.00

Table 4-3: Eigenvectors of a Rotated Component of Material QOL Indicators

Variable	Comp1	Unexplained
Income	0.619	0.197
Non-poverty	0.642	0.138
Employment	0.452	0.572

$$Material\ QOL\ index = 0.619 * m1 + 0.642 * m2 + 0.452 * m3 \quad (4\text{-}1)$$

where,
m1: Income (Household Income)
m2: Non-poverty (Non-poverty Rate)
m3: Employment (Employment Rate)

Table 4-4 and Table 4-5 show PCA results of social QOL indices. According to results, the social QOL domain has three meaningful PCA components. The first three components' eigenvalues account for 76% of total variance. After conducting PCA, eigenvectors of a rotation matrix were obtained to clearly understand the structure of information as shown in Table 4-6. Table 4-5 shows that the first PCA component is a measure of general QOL because the PCA component accounts for the majority of total variance and most indicators contribute to the first component. The second PCA component could be interpreted as a subjective QOL component; it shows a contrast between objective QOL indicators and subjective QOL indicators. The last PCA component is a safety-related QOL index; the safety indicator highly contributes to the component as shown in Table 4-6. As shown in Equation (4-2) - (4-4), the researcher generated three social QOL indices using PCA results.

Table 4-4: Eigenvalues of a Correlation Matrix of Social QOL Indicators

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.23	0.97	0.37	0.37
Comp2	1.26	0.20	0.21	0.58
Comp3	1.06	0.40	0.18	0.76
Comp4	0.66	0.10	0.11	0.87
Comp5	0.55	0.32	0.09	0.96
Comp6	0.23	.	0.04	1.00

Table 4-5: Eigenvectors of Social QOL Indicators

Variable	Comp1	Comp2	Comp3	Unexplained
Education	.558	.076	-.388	.137
Health	.536	.291	-.067	.246
Civic engagement	.417	.354	.050	.452
Subjective well-being	.359	-.527	.259	.291
Social support	.311	-.573	.315	.264
Safety	.050	.423	.822	.051

Table 4-6: Eigenvectors of Rotated Components of Social QOL Indicators

Variable	Comp1	Comp2	Comp3	Unexplained
Education	.626	.047	-.273	.137
Health	.604	-.007	.110	.246
Civic engagement	.491	-.066	.236	.452
Subjective well-being	.044	.686	-.001	.291
Social support	-.031	.723	.024	.264
Safety	-.012	.013	.926	.051

$$Social\ QOL\ index1 = .626 * S1 + .604 * s2 + .491 * s3 + .044 * \mathrm{s4} - .031 * \mathrm{s5} - .012 * \mathrm{s6} \quad (4\text{-}2)$$

$$Social\ QOL\ index2 = .047 * S1 - .007 * s2 - .066 * s3 + .686 * \mathrm{s4} + .723 * \mathrm{s5} + .013 * \mathrm{s6} \quad (4\text{-}3)$$

$$Social\ QOL\ index3 = -.273 * S1 + .110 * s2 + .236 * s3 - .001 * \mathrm{s4} + .024 * \mathrm{s5} + .926 * \mathrm{s6} \quad (4\text{-}4)$$

where
s1: Education (educational attainment)
s2: Health (life expectancy)
s3: Civic engagement (voter turnout)
s4: Subjective well-being (life satisfaction)
s5: Social support (social support from friends and family)
s6: Safety (1-crime rate)

Regarding an environmental QOL index, the researcher utilized Air Quality Index (AQI) as a proxy variable for measuring environmental QOL. AQI is already an index of five air pollutant indicators. Material QOL, social QOL, and environmental QOL indices act as dependent variables to measure the impacts of the hospitality and tourism industry on community social QOL.

4.2.2 Diagnostic tests for checking OLS assumptions

Even though the present researcher already has proposed alternative methods to estimate the impacts of the hospitality and tourism industry on community QOL, Ordinary Least Squares (OLS) regression remains a good option to conduct research. That is because

OLS results could provide useful information about data quality, suggesting analytical strategies to researchers. More specifically, OLS is a basis of preliminary tests for checking classical linear model (CLM) assumptions.

The preliminary tests mainly examine the classical linear model assumptions by checking residuals of OLS estimators and correlations among variables. When the CLM assumptions are satisfied, the OLS estimators have very high efficiency in parameter estimation. However, in real world cases, the assumptions are easily violated. The assumptions are 1) Linear in parameters, 2) No perfect collinearity, 3) Zero conditional mean, 4) Homoskedasticity, and 5) Normality. According to the Gauss-Markov theorem, the first three assumptions are the necessary conditions of estimators' unbiasedness; the fourth condition (homoscedasticity) determines the efficiency of estimators. When the Gauss-Markov assumptions are satisfied, the OLS estimator is called the Best Linear Unbiased Estimator (BLUE). To check CLM assumptions, the researcher subsequently presents preliminary test results in the following five sections (e.g. Linearity, No perfect collinearity, Zero conditional mean, Homoskedasticity, and Normality).

Linearity assumption

The linearity assumption can be checked by examining scatter plots of a dependent variable and independent variables. The plots are presented in Figure A-1 - Figure A-5 (see page 157-161). According to the patterns of scatter plots, the dependent variables in the research model have a linear relationship with independent variables. Additionally, the present research used a Cobb-Douglas utility function as a mathematical form for a regression model. After log transformation, the function became a linear equation. Given that empirical evidence of the scatter plots and research model's functional form, the researcher concluded that the linearity assumption is satisfied. Linearity means that there is a constant relationship between dependent and independent variables for the entire range of values of the variables. This is a basic assumption of regression estimation.

No perfect collinearity assumption

Perfect collinearity or multicollinearity issues in more realistic cases can be checked by investigating the Variance Inflation Factor (VIF). Table 4-7 shows the VIF scores of key independent variables, indicating that there is no issue of multicollinearity. Even though one independent variable shows a relatively high score of VIF, it is within acceptable ranges since the score is under 10 (O'brien, 2007). Average VIF of variables is 2.96. No perfect collinearity means that two or more independent variables in a regression model are less correlated, indicating that no linear relationship exists among independent variables.

Table 4-7: VIF Scores of Key Independent Variables

Variable	VIF	1/VIF
NAICS_54	8.09	0.124
NAICS_56	5.93	0.169
NAICS_44	4.85	0.206
NAICS_72	4.83	0.207
NAICS_53	4.47	0.223
NAICS_52	3.86	0.259
NAICS_51	3.81	0.262
NAICS_71	3.76	0.266
NAICS_42	3.67	0.272
NAICS_23	3.63	0.275
Rural-urban continuum code	3.25	0.308
NAICS_81	3.15	0.318
NAICS_62	3.10	0.322
NAICS_61	3.05	0.328
NAICS_31	2.35	0.426
NAICS_55	2.32	0.431
NAICS_11	2.15	0.466
Non-metro recreation county	2.02	0.494
NAICS_48	2.01	0.497
NAICS_21	2.01	0.497
NAICS_22	1.96	0.511
Services-dependent county	1.95	0.512
Manufacturing-dependent county	1.84	0.543
Federal/State government-dependent county	1.63	0.614
Retirement destination county	1.40	0.713
Mining-dependent county	1.36	0.737
Mega city	1.35	0.743
Farm-dependent county	1.11	0.903
Outliers	1.06	0.944
Mean VIF	2.96	

Zero conditional mean

The zero conditional mean assumption indicates that the residuals or error terms have an expected value of zero given any values of the independent variables. This assumption can be simply checked in two ways. The first is to see scatter plots of residuals and identify the pattern of residuals. As shown in Figure A-6-Figure A-10 (see pages 162-166), the scatter plots indicate that the error terms have an expected value of zero. The second way is to test the assumption statistically. The researcher conducted the t-test for zero conditional mean (i.e. H0: U = 0). Table 4-8 shows t-test results for checking the zero conditional mean assumption, confirming that the zero conditional mean assumption is satisfied.

Table 4-8: T-test Results of Testing Zero Conditional Mean of Residuals

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
e1	775	0	0.270	0.754	-0.053	0.053
e2	775	0	0.022	0.618	-0.043	0.043
e3	775	0	0.026	0.748	-0.052	0.052
e4	775	0	0.027	0.770	-0.054	0.054
e5	775	0	0.026	0.740	-0.052	0.052

e1: residuals of material QOL model; e2: residuals of social QOL1 model; e3: residuals of social QOL2 model; e4: residuals of social QOL3 model; e5: residuals of environmental QOL model

According to the Gauss-Markov theorem, the researcher determines that the OLS estimators are unbiased since the first three conditions of the CLM assumptions are satisfied.

Homoskedasticity

The homoskedasticity assumption means that the error term has the equal variance given any values of independent variables. If the homoskedasticity assumption fails, the estimation model will have a heteroskedasticity problem. According to the Gauss-Markov theorem, when a heteroskedasticity problem exists, the estimator will be no longer BLUE. However, if the other assumptions are satisfied, the estimators remain unbiased. To check the homoskedasticity assumption, the researcher examined the scatter plots of residuals again. The plots are presented in Figure A-6 - Figure A-10 (see pages 162-166).

According to the figures, the plots show residuals of material QOL, social QOL1, social QOL2, and social QOL3 have equal variance. However, residuals of the environmental QOL model show a pattern of unequal variance. Therefore, one can conclude that the OLS estimators of the material QOL and social QOL models are BLUE. Yet the OLS estimators of the environmental QOL model could lead to incorrect inferential decisions unless heteroskedasticity is resolved. To solve such an issue, the present researcher used White's heteroskedasticity-consistent standard error.

Normality

The last CLM assumption is a normality assumption of residuals, essentially critical in small sample cases. However, in large sample statistics like the present research, this assumption could be loosened because of the property of asymptotic normality in large sample size statistics. The assumption can be checked by examining the normal probability plot of residuals. The normal probability plot and distributional dot plot are presented in Figure A-11-Figure A-20 (pages 167-171).

According to the normal probability plots, the normality assumption is satisfied. Moreover, the property of asymptotic normality of large sample size statistics also supports that the normality assumption is satisfied. According to Wooldridge (2012), even though observations are not from a normal distribution, one can conclude that the OLS estimators satisfy the asymptotic normality as long as they originate from large samples size statistics.

The distributional dot plots provide additional information about samples. The distributional dot plot of the environmental QOL model indicates that the sample has few outliers. In statistical analysis of small sample size cases, the existence of outliers could lead to incorrect decisions. However, in large sample size analysis, the influences of outliers are limited. If the influences of the outliers are appropriately treated in analysis, they can provide important information about samples.

4.3 Estimation results

The present study proposed five estimation research models to check research hypotheses. The proposed models are OLS regression, OLS estimation with robust standard errors, SURE, multivariate regression with SUE estimation, and SURE with Maximum Likelihood (ML) estimation. After diagnosing research models, the researcher selected a final estimation model, checking research hypotheses.

4.3.1 OLS regression model

OLS estimation results are shown in Table 4-9-Table 4-13. Each model's R-square is .644, .774, .173, .445, and .517 respectively. According to the F-statistics of each OLS regression model, all estimation models are statistically significant. However, as mentioned in Chapter 4.2.2 and shown in Figure A-10, the environmental QOL model has some problems. The first is heteroskedasticity. As such, statistical results could be incorrect because the t-test is based on the assumption of homogenous variance. The second problem is that the samples have some outliers. With respect to the outlier issues, in small sample cases, the existence of any outlier could lead to incorrect results. To achieve correct results, the researcher needed to resolve such an issue first. For heteroskedasticity, the most popular strategy is to conduct OLS regression with robust standard errors. In Chapter 4.3.2, the researcher demonstrated how to use such robust standard errors in OLS estimation in heteroskedasticity cases.

Regarding outlier issues in the environmental QOL model, the common remedy is to eliminate outliers. However, the researcher decided to keep the outlier observations because such outliers were scientifically measured and it was believed that the outliers show meaningful information. For example, according to the National Climatic Data Center, in 2008, many counties in California and Arizona suffered from a number of wildfire. The locations of some outliers are very similar to the areas. Additionally, the outlier in Hawaii indicated a different perspective. During 2007 and 2008, Kilauea Volcano erupted, negatively affecting air quality around the county. Los Angeles and Cook counties are also outliers. One possible reason for this situation is that the numbers of county residents, 9.8 and 5.2 million, respectively. Given such side information, the outlier could be an important indicator for measuring a natural and/or social factors. In the statistical model, the factor was treated as a dummy variable.

Table 4-9: Results of OLS Estimation in Material QOL Model

	β	Std. Err.	t	P>|t|
NAICS_11	-0.112**	0.031	-3.58	0.000
NAICS_21	0.044	0.028	1.55	0.121
NAICS_22	-0.134**	0.046	-2.88	0.004
NAICS_23	1.371**	0.120	11.42	0.000
NAICS_31	-0.070	0.098	-0.72	0.472
NAICS_42	-0.206	0.115	-1.78	0.075
NAICS_44	-0.398	0.227	-1.75	0.081
NAICS_48	0.096	0.088	1.09	0.276
NAICS_51	0.172	0.110	1.56	0.119
NAICS_52	0.426**	0.154	2.76	0.006
NAICS_53	-0.867**	0.126	-6.87	0.000
NAICS_54	0.964**	0.155	6.20	0.000
NAICS_55	0.015	0.059	0.25	0.801
NAICS_56	0.232	0.162	1.43	0.152
NAICS_61	0.188*	0.088	2.14	0.033
NAICS_62	-0.992**	0.163	-6.08	0.000
NAICS_71	0.461**	0.104	4.42	0.000
NAICS_72	-0.299	0.184	-1.62	0.105
NAICS_81	0.260	0.187	1.39	0.165
Rural-urban continuum code	-0.520**	0.076	-6.84	0.000
Farm-dependent county	-0.446	0.331	-1.35	0.178
Mining-dependent county	0.634**	0.208	3.06	0.002
Manufacturing-dependent county	0.161	0.084	1.92	0.055
Federal/State government-dependent county	0.052	0.100	0.52	0.605
Services-dependent county	-0.056	0.087	-0.65	0.519
Non-metro recreation county	-0.155	0.134	-1.16	0.248
Retirement destination county	-0.194*	0.089	-2.17	0.030
Constant	0.614	0.492	1.25	0.213
R^2	.644			
$F(27,\ 747)$	50.05**			
N	775			

*p<.05. **p<.01.

Table 4-10: Results of OLS estimation in social QOL1 model

	β	Std. Err.	t	P>|t|
NAICS_11	0.030	0.026	1.17	0.242
NAICS_21	-0.076**	0.023	-3.28	0.001
NAICS_22	-0.162**	0.038	-4.27	0.000
NAICS_23	0.972**	0.099	9.86	0.000
NAICS_31	0.079	0.080	0.99	0.325
NAICS_42	-0.188*	0.095	-1.99	0.047
NAICS_44	-1.134**	0.187	-6.08	0.000
NAICS_48	-0.307**	0.072	-4.25	0.000
NAICS_51	0.366**	0.090	4.05	0.000
NAICS_52	0.037	0.127	0.29	0.772
NAICS_53	-0.551**	0.104	-5.32	0.000
NAICS_54	0.909**	0.127	7.13	0.000
NAICS_55	0.086	0.048	1.79	0.074
NAICS_56	0.215	0.133	1.62	0.106
NAICS_61	0.397**	0.072	5.50	0.000
NAICS_62	-0.239	0.134	-1.78	0.075
NAICS_71	0.585**	0.086	6.83	0.000
NAICS_72	0.451**	0.151	2.99	0.003
NAICS_81	0.268	0.154	1.75	0.081
Rural-urban continuum code	-0.101	0.062	-1.62	0.105
Farm-dependent county	-0.239	0.272	-0.88	0.380
Mining-dependent county	0.122	0.170	0.72	0.474
Manufacturing-dependent county	0.185**	0.069	2.69	0.007
Federal/State government-dependent county	0.161	0.082	1.96	0.050
Services-dependent county	0.041	0.072	0.57	0.572
Non-metro recreation county	-0.253**	0.110	-2.30	0.022
Retirement destination county	0.073	0.073	1.00	0.318
Constant	1.137**	0.404	2.81	0.005
R^2	.774			
$F(27, 747)$	94.96**			
N	775			

*p<.05. **p<.01.

Table 4-11: Results of OLS estimation in social QOL2 model

	β	Std. Err.	t	P>|t|
NAICS_11	0.099**	0.031	3.20	0.001
NAICS_21	0.045	0.028	1.60	0.109
NAICS_22	-0.013	0.046	-0.28	0.778
NAICS_23	0.283*	0.119	2.37	0.018
NAICS_31	-0.225*	0.097	-2.32	0.021
NAICS_42	0.063	0.114	0.55	0.584
NAICS_44	0.441	0.226	1.96	0.051
NAICS_48	-0.106	0.087	-1.21	0.227
NAICS_51	-0.142	0.109	-1.30	0.194
NAICS_52	0.149	0.153	0.97	0.332
NAICS_53	0.131	0.125	1.05	0.295
NAICS_54	0.293	0.154	1.90	0.058
NAICS_55	0.127*	0.058	2.18	0.030
NAICS_56	0.132	0.161	0.82	0.410
NAICS_61	0.083	0.087	0.95	0.344
NAICS_62	-0.374*	0.162	-2.31	0.021
NAICS_71	0.188	0.104	1.82	0.070
NAICS_72	-0.364*	0.183	-2.00	0.046
NAICS_81	-0.478*	0.186	-2.57	0.010
Rural-urban continuum code	-0.058	0.076	-0.77	0.442
Farm-dependent county	-0.051	0.328	-0.16	0.877
Mining-dependent county	-0.087	0.206	-0.42	0.673
Manufacturing-dependent county	0.184*	0.083	2.20	0.028
Federal/State government-dependent county	0.045	0.099	0.46	0.647
Services-dependent county	-0.022	0.087	-0.26	0.796
Non-metro recreation county	-0.228	0.133	-1.72	0.087
Retirement destination county	0.079	0.089	0.89	0.374
Constant	0.824	0.489	1.69	0.092
R^2	.173			
F(27, 747)	5.80**			
N	775			

*p<.05. **p<.01.

Table 4-12: Results of OLS estimation in social QOL3 model

	B	Std. Err.	t	P>|t|
NAICS_11	0.034	0.032	1.07	0.283
NAICS_21	0.004	0.029	0.12	0.901
NAICS_22	0.037	0.047	0.77	0.439
NAICS_23	1.068**	0.123	8.72	0.000
NAICS_31	0.290**	0.100	2.91	0.004
NAICS_42	-0.392**	0.118	-3.33	0.001
NAICS_44	-0.546*	0.232	-2.35	0.019
NAICS_48	0.043	0.090	0.48	0.634
NAICS_51	0.340**	0.112	3.02	0.003
NAICS_52	0.011	0.157	0.07	0.946
NAICS_53	-1.108**	0.129	-8.60	0.000
NAICS_54	0.036	0.159	0.23	0.820
NAICS_55	-0.033	0.060	-0.54	0.588
NAICS_56	-0.278	0.165	-1.68	0.093
NAICS_61	0.157	0.090	1.75	0.081
NAICS_62	-0.226	0.167	-1.36	0.175
NAICS_71	0.607**	0.107	5.70	0.000
NAICS_72	-0.473*	0.188	-2.52	0.012
NAICS_81	0.290	0.191	1.52	0.130
Rural-urban continuum code	0.047	0.078	0.61	0.542
Farm-dependent county	-0.168	0.338	-0.50	0.620
Mining-dependent county	0.566**	0.212	2.67	0.008
Manufacturing-dependent county	0.095	0.086	1.11	0.267
Federal/State government-dependent county	-0.138	0.102	-1.36	0.176
Services-dependent county	0.104	0.089	1.17	0.243
Non-metro recreation county	-0.025	0.137	-0.18	0.854
Retirement destination county	0.093	0.091	1.02	0.307
Constant	0.848	0.503	1.69	0.092
R^2	.445			
F(27, 747)	22.23**			
N	775			

*p<.05. **p<.01.

Table 4-13: Results of OLS Estimation in Environmental QOL Model

	B	Std. Err.	t	P>|t|
NAICS_11	0.077	0.031	2.49	0.013
NAICS_21	0.116	0.028	4.13	0.000
NAICS_22	-0.054	0.046	-1.18	0.238
NAICS_23	0.491	0.119	4.14	0.000
NAICS_31	-0.049	0.096	-0.51	0.612
NAICS_42	-0.357	0.114	-3.13	0.002
NAICS_44	0.170	0.224	0.76	0.448
NAICS_48	-0.039	0.087	-0.44	0.657
NAICS_51	0.400	0.109	3.68	0.000
NAICS_52	-0.023	0.154	-0.15	0.883
NAICS_53	-0.114	0.130	-0.88	0.379
NAICS_54	-0.343	0.154	-2.24	0.026
NAICS_55	-0.134	0.058	-2.30	0.022
NAICS_56	0.190	0.162	1.17	0.242
NAICS_61	0.001	0.086	0.01	0.989
NAICS_62	-0.036	0.160	-0.22	0.825
NAICS_71	0.193	0.104	1.86	0.064
NAICS_72	-0.144	0.182	-0.79	0.431
NAICS_81	0.188	0.185	1.01	0.312
Rural-urban continuum code	-0.093	0.075	-1.23	0.217
Farm-dependent county	0.082	0.326	0.25	0.801
Mining-dependent county	0.122	0.204	0.60	0.549
Manufacturing-dependent county	0.063	0.083	0.77	0.443
Federal/State government-dependent county	-0.135	0.098	-1.37	0.170
Services-dependent county	-0.001	0.086	-0.01	0.990
Non-metro recreation county	-0.387	0.132	-2.93	0.003
Retirement destination county	0.033	0.088	0.38	0.705
Mega city	-0.901	0.359	-2.51	0.012
Outliers	-5.186	0.236	-21.97	0.000
Constant	0.327	0.487	-1.20	0.232
R^2	.517			
F(29, 745)	27.51**			
N	775			

*p<.05. **p<.01.

4.3.2 OLS estimation with robust standard errors

Practically, finding a dataset that meets all of the CLM assumptions is quite difficult. Such a failure to satisfy CLM assumptions may lead to incorrect results. Therefore, social scientists need to know how to deal with such a situation such as the heteroscedasticity in cross-sectional studies that commonly violates CLM assumptions. One of the effective methods to handle such a situation is to use robust standard errors, an application of the Huber-White sandwich estimators. Robust standard errors can handle various CLM assumption violations like heteroscedasticity (Petersen, 2009).

Estimation results are presented in Table 4-14 ~ Table 4-18. Each model's R-square is identical with that of previously mentioned OLS models because this approach uses robust standard errors instead of OLS standard errors. Results show conservative estimation results and test statistics because the robust standard errors are normally larger than OLS standard errors.

Table 4-14: Results of OLS Estimation with Robust Standard Errors in Material QOL

	β	Robust SE	t	P>|t|
NAICS_11	-0.112**	0.030	-3.78	0.000
NAICS_21	0.044	0.028	1.55	0.122
NAICS_22	-0.134**	0.043	-3.07	0.002
NAICS_23	1.371**	0.129	10.61	0.000
NAICS_31	-0.070	0.111	-0.63	0.527
NAICS_42	-0.206	0.129	-1.60	0.110
NAICS_44	-0.398	0.246	-1.62	0.106
NAICS_48	0.096	0.103	0.94	0.350
NAICS_51	0.172	0.117	1.47	0.143
NAICS_52	0.426**	0.159	2.67	0.008
NAICS_53	-0.867**	0.137	-6.32	0.000
NAICS_54	0.964**	0.170	5.68	0.000
NAICS_55	0.015	0.060	0.25	0.804
NAICS_56	0.232	0.160	1.45	0.148
NAICS_61	0.188*	0.093	2.02	0.044
NAICS_62	-0.992**	0.166	-5.96	0.000
NAICS_71	0.461**	0.105	4.40	0.000
NAICS_72	-0.299	0.207	-1.45	0.148
NAICS_81	0.260	0.194	1.34	0.181
Rural-urban continuum code	-0.520**	0.077	-6.77	0.000
Farm-dependent county	-0.446	0.412	-1.08	0.279
Mining-dependent county	0.634**	0.206	3.08	0.002
Manufacturing-dependent county	0.161*	0.076	2.12	0.035
Federal/State government-dependent county	0.052	0.109	0.48	0.635
Services-dependent county	-0.056	0.086	-0.65	0.513
Non-metro recreation county	-0.155	0.144	-1.08	0.281
Retirement destination county	-0.194	0.099	-1.96	0.050
Constant	0.614	0.495	1.24	0.216
R^2	.644			
$F(27, 747)$	46.56**			
N	775			

*p<.05. **p<.01.

Table 4-15: Results of OLS Estimation with Robust Standard Errors in Social QOL1

	B	Robust SE	t	P>|t|
NAICS_11	0.030	0.028	1.08	0.281
NAICS_21	-0.076**	0.024	-3.17	0.002
NAICS_22	-0.162**	0.038	-4.30	0.000
NAICS_23	0.972**	0.116	8.36	0.000
NAICS_31	0.079	0.090	0.88	0.382
NAICS_42	-0.188	0.099	-1.90	0.058
NAICS_44	-1.134**	0.204	-5.55	0.000
NAICS_48	-0.307**	0.073	-4.21	0.000
NAICS_51	0.366**	0.094	3.90	0.000
NAICS_52	0.037	0.137	0.27	0.788
NAICS_53	-0.551**	0.125	-4.41	0.000
NAICS_54	0.909**	0.142	6.40	0.000
NAICS_55	0.086	0.052	1.65	0.098
NAICS_56	0.215	0.161	1.33	0.183
NAICS_61	0.397**	0.074	5.33	0.000
NAICS_62	-0.239	0.144	-1.65	0.099
NAICS_71	0.585**	0.094	6.19	0.000
NAICS_72	0.451**	0.160	2.81	0.005
NAICS_81	0.268	0.183	1.46	0.144
Rural-urban continuum code	-0.101	0.064	-1.57	0.116
Farm-dependent county	-0.239	0.291	-0.82	0.413
Mining-dependent county	0.122	0.183	0.67	0.506
Manufacturing-dependent county	0.185**	0.064	2.88	0.004
Federal/State government-dependent county	0.161	0.093	1.73	0.084
Services-dependent county	0.041	0.072	0.57	0.572
Non-metro recreation county	-0.253*	0.105	-2.41	0.016
Retirement destination county	0.073	0.078	0.94	0.349
Constant	1.137**	0.411	2.76	0.006
R^2	. 774			
F(27, 747)	103.53**			
N	775			

*p<.05. **p<.01.

Table 4-16: Results of OLS Estimation with Robust Standard Errors in Social QOL2

	β	Robust SE	t	P>|t|
NAICS_11	0.099**	0.029	3.43	0.001
NAICS_21	0.045	0.030	1.52	0.128
NAICS_22	-0.013	0.044	-0.30	0.767
NAICS_23	0.283*	0.135	2.10	0.036
NAICS_31	-0.225*	0.089	-2.51	0.012
NAICS_42	0.063*	0.108	0.58	0.564
NAICS_44	0.441	0.222	1.99	0.047
NAICS_48	-0.106	0.100	-1.06	0.289
NAICS_51	-0.142	0.133	-1.07	0.284
NAICS_52	0.149	0.185	0.80	0.423
NAICS_53	0.131	0.136	0.96	0.336
NAICS_54	0.293	0.175	1.67	0.095
NAICS_55	0.127	0.068	1.87	0.062
NAICS_56	0.132	0.178	0.75	0.456
NAICS_61	0.083	0.108	0.76	0.447
NAICS_62	-0.374*	0.168	-2.22	0.026
NAICS_71	0.188	0.120	1.57	0.117
NAICS_72	-0.364	0.198	-1.84	0.066
NAICS_81	-0.478*	0.217	-2.21	0.028
Rural-urban continuum code	-0.058	0.101	-0.57	0.566
Farm-dependent county	-0.051	0.379	-0.13	0.893
Mining-dependent county	-0.087	0.192	-0.45	0.651
Manufacturing-dependent county	0.184*	0.091	2.02	0.044
Federal/State government-dependent county	0.045	0.084	0.54	0.588
Services-dependent county	-0.022	0.076	-0.30	0.767
Non-metro recreation county	-0.228	0.125	-1.83	0.067
Retirement destination county	0.079	0.094	0.84	0.400
Constant	0.824	0.528	1.56	0.119
R^2	.173			
F(27, 747)	6.41**			
N	775			

*p<.05. **p<.01.

Table 4-17: Results of OLS Estimation with Robust Standard Errors in Social QOL3

	β	Robust SE	t	P>|t|
NAICS_11	0.034	0.035	0.99	0.324
NAICS_21	0.004	0.028	0.13	0.896
NAICS_22	0.037	0.047	0.78	0.438
NAICS_23	1.068**	0.163	6.54	0.000
NAICS_31	0.290**	0.103	2.81	0.005
NAICS_42	-0.392**	0.145	-2.70	0.007
NAICS_44	-0.546*	0.261	-2.09	0.037
NAICS_48	0.043	0.101	0.42	0.672
NAICS_51	0.340**	0.119	2.86	0.004
NAICS_52	0.011	0.194	0.05	0.956
NAICS_53	-1.108**	0.224	-4.94	0.000
NAICS_54	0.036	0.198	0.18	0.856
NAICS_55	-0.033	0.066	-0.49	0.621
NAICS_56	-0.278	0.214	-1.30	0.194
NAICS_61	0.157	0.089	1.75	0.080
NAICS_62	-0.226	0.171	-1.33	0.185
NAICS_71	0.607**	0.125	4.86	0.000
NAICS_72	-0.473*	0.212	-2.24	0.026
NAICS_81	0.290	0.228	1.27	0.204
Rural-urban continuum code	0.047	0.076	0.62	0.533
Farm-dependent county	-0.168	0.352	-0.48	0.633
Mining-dependent county	0.566**	0.187	3.02	0.003
Manufacturing-dependent county	0.095	0.080	1.18	0.237
Federal/State government-dependent county	-0.138	0.104	-1.33	0.185
Services-dependent county	0.104	0.092	1.13	0.258
Non-metro recreation county	-0.025	0.126	-0.20	0.841
Retirement destination county	0.093	0.084	1.12	0.265
Constant	0.848	0.493	1.72	0.086
R^2	.445			
F(27, 747)	18.06**			
N	775			

*p<.05. **p<.01.

Table 4-18: Results of OLS Estimation with Robust Standard Errors in Environmental QOL

	β	Robust SE	t	P>|t|
NAICS_11	0.077**	0.026	2.92	0.004
NAICS_21	0.116**	0.040	2.88	0.004
NAICS_22	-0.054	0.044	-1.23	0.221
NAICS_23	0.491**	0.133	3.70	0.000
NAICS_31	-0.049	0.086	-0.57	0.569
NAICS_42	-0.357**	0.113	-3.16	0.002
NAICS_44	0.170	0.194	0.88	0.380
NAICS_48	-0.039	0.092	-0.42	0.677
NAICS_51	0.400**	0.100	3.99	0.000
NAICS_52	-0.023	0.159	-0.14	0.887
NAICS_53	-0.114	0.141	-0.81	0.418
NAICS_54	-0.343*	0.143	-2.39	0.017
NAICS_55	-0.134**	0.048	-2.77	0.006
NAICS_56	0.190	0.137	1.39	0.165
NAICS_61	0.001	0.079	0.02	0.988
NAICS_62	-0.036	0.142	-0.25	0.803
NAICS_71	0.193*	0.098	1.97	0.049
NAICS_72	-0.144	0.227	-0.63	0.526
NAICS_81	0.188	0.195	0.96	0.337
Rural-urban continuum code	-0.093	0.068	-1.36	0.173
Farm-dependent county	0.082	0.307	0.27	0.789
Mining-dependent county	0.122	0.166	0.74	0.462
Manufacturing-dependent county	0.063	0.074	0.86	0.390
Federal/State government-dependent county	-0.135	0.154	-0.87	0.383
Services-dependent county	-0.001	0.077	-0.01	0.988
Non-metro recreation county	-0.387	0.216	-1.79	0.073
Retirement destination county	0.033	0.100	0.33	0.738
Mega city	-0.901	0.732	-1.23	0.219
Outliers	-5.186**	0.987	-5.25	0.000
Constant	0.327	0.442	0.74	0.460
R^2	.517			
$F(29, 745)$	13.13**			
N	775			

*p<.05. **p<.01.

Basically, estimation results provide more robust results than regular OLS estimations. However, the present research hypothesized that community QOL consists of its sub-domains: material, social, and environmental. They are related to each other concerning community QOL, an umbrella term of QOL research. Statistically speaking, all county-level indicators come from the same county, making them more likely to be correlated. Thus, it is necessary to consider such relationships among QOL domains in the research model. Table 4-19 shows a correlation matrix of residuals of QOL domains. Additionally, Breusch-Pagan test results for independence also confirmed that each QOL domains is related to each other. Given such evidence, the present researcher needed to reflect such relationships in the research model, using a regression equation system. One of the accepted reputable equation system models is Seemingly Unrelated Regression Model (SURE). In Chapter 4.3.3, statistical results of the SURE model are presented.

Table 4-19: Correlation Matrix of Residuals of QOL Models:

	Material QOL	Social QOL1	Social QOL2	Social QOL3	Environmental QOL
Material QOL	1.000				
Social QOL1	0.423	1.000			
Social QOL2	0.126	0.101	1.000		
Social QOL3	0.328	0.437	0.008	1.000	
Environmental QOL	0.101	0.137	0.008	0.135	1.000

Breusch-Pagan test of independence: chi2(10) = 427.145, Pr = 0.0000

4.3.3 SURE model

Table 4-20 shows estimation results of SURE modeling. Each model's R-square is .644, .774, .173, .446, and .517, respectively. Such statistics are very similar to OLS results. However, estimated coefficients are different. The SURE model is not a perfect estimation because it is based on the strong assumption of homoscedasticity of variance. As shown in Figure A-10, the researcher identified that the environmental QOL has a heteroskedasticity problem, leading to incorrect decisions about the impacts of the hospitality and tourism industry. In this regard, some scholars have been attempting to overcome that limitation. For example, Weesie (1999) suggested the Seemingly Unrelated Estimation (SUE) model, a statistical technique of a post-estimation model. The model consists of two steps. The first estimates coefficients of parameters. The next step estimates co-variance and correlation tables separately, combining the information to test significance of estimated coefficients. The SUE estimation results are presented in Chapter 4.4.4.

Table 4-20: Results of SURE Model

	Material QOL			Social QOL1			Social QOL2			Social QOL3			Environmental QOL		
	β	SE	z	β	SE	z	β	SE	z	β	SE	z	β	SE	z
NAICS_11	-0.112**	0.031	-3.65	0.030	0.025	1.19	0.099**	0.030	3.26	0.034	0.031	1.09	0.074*	0.030	2.44
NAICS_21	0.044	0.028	1.58	-0.076**	0.023	-3.34	0.045	0.028	1.63	0.004	0.028	0.13	0.114**	0.027	4.15
NAICS_22	-0.134**	0.046	-2.93	-0.162**	0.037	-4.35	-0.013	0.045	-0.29	0.037	0.046	0.79	-0.056	0.045	-1.24
NAICS_23	1.371	0.118	11.63	0.972**	0.097	10.05	0.283*	0.117	2.42	1.068**	0.120	8.88	0.488**	0.116	4.20
NAICS_31	-0.070	0.096	-0.73	0.079	0.079	1.00	-0.225*	0.095	-2.36	0.290**	0.098	2.97	-0.046	0.094	-0.48
NAICS_42	-0.206	0.113	-1.82	-0.188*	0.093	-2.02	0.063	0.112	0.56	-0.392**	0.116	-3.40	-0.353**	0.112	-3.16
NAICS_44	-0.398	0.223	-1.78	-1.134**	0.183	-6.19	0.441*	0.222	1.99	-0.546*	0.228	-2.39	0.179	0.220	0.81
NAICS_48	0.096	0.087	1.11	-0.307**	0.071	-4.33	-0.106	0.086	-1.23	0.043	0.088	0.49	-0.038	0.085	-0.45
NAICS_51	0.172	0.108	1.59	0.366**	0.089	4.13	-0.142	0.107	-1.33	0.340**	0.110	3.08	0.403**	0.107	3.78
NAICS_52	0.426*	0.151	2.81	0.037	0.124	0.30	0.149	0.150	0.99	0.011	0.155	0.07	-0.035	0.151	-0.23
NAICS_53	-0.867	0.124	-7.00	-0.551**	0.102	-5.42	0.131	0.123	1.07	-1.108**	0.126	-8.76	-0.093	0.127	-0.73
NAICS_54	0.964	0.153	6.32	0.909**	0.125	7.26	0.293	0.151	1.93	0.036	0.156	0.23	-0.349*	0.151	-2.32
NAICS_55	0.015	0.058	0.26	0.086	0.047	1.82	0.127*	0.057	2.22	-0.033	0.059	-0.55	-0.138*	0.057	-2.42
NAICS_56	0.232	0.159	1.46	0.215	0.130	1.65	0.132	0.158	0.84	-0.278	0.162	-1.71	0.172	0.159	1.08
NAICS_61	0.188	0.086	2.18	0.397**	0.071	5.60	0.083	0.086	0.97	0.157	0.088	1.78	0.002	0.085	0.02
NAICS_62	-0.992	0.160	-6.19	-0.239	0.131	-1.82	-0.374*	0.159	-2.35	-0.226	0.163	-1.38	-0.036	0.157	-0.23
NAICS_71	0.461	0.102	4.50	0.585**	0.084	6.96	0.188	0.102	1.85	0.607**	0.105	5.81	0.201*	0.102	1.98
NAICS_72	-0.299	0.181	-1.66	0.451**	0.148	3.04	-0.364*	0.179	-2.03	-0.473*	0.184	-2.57	-0.159	0.179	-0.89
NAICS_81	0.260	0.184	1.42	0.268	0.151	1.78	-0.478**	0.182	-2.62	0.290	0.188	1.54	0.202	0.182	1.11
Rural-urban continuum code	-0.520	0.075	-6.97	-0.101	0.061	-1.65	-0.058	0.074	-0.78	0.047	0.076	0.62	-0.095	0.073	-1.29
Farm-dependent	-0.446	0.325	-1.37	-0.239	0.267	-0.90	-0.051	0.322	-0.16	-0.168	0.332	-0.51	0.084	0.319	0.26
Mining-dependent	0.634	0.204	3.11	0.122	0.167	0.73	-0.087	0.202	-0.43	0.566**	0.208	2.72	0.128	0.200	0.64
Manufacturing-dependent	0.161	0.082	1.96	0.185**	0.068	2.74	0.184*	0.082	2.25	0.095	0.084	1.13	0.063	0.081	0.78
F/S government-dependent	0.052	0.098	0.53	0.161*	0.080	2.00	0.045	0.097	0.47	-0.138	0.100	-1.38	-0.136	0.096	-1.41
Services-dependent	-0.056*	0.086	-0.66	0.041	0.070	0.58	-0.022	0.085	-0.26	0.104	0.087	1.19	0.004	0.085	0.04
Non-metro recreation	-0.155	0.132	-1.18	-0.253*	0.108	-2.34	-0.228	0.131	-1.75	-0.025	0.135	-0.19	-0.389**	0.130	-3.01
Retirement destination	-0.194	0.088	-2.21	0.073	0.072	1.02	0.079	0.087	0.91	0.093	0.090	1.04	0.030	0.086	0.34
Mega city													-1.113**	0.347	-3.21
Outlier													-5.108**	0.228	-22.37
Constant	0.614	0.483	1.27	1.137**	0.397	2.87	0.824	0.480	1.72	0.848	0.493	1.72	0.313	0.477	0.66
R[2]	.644			.774			.173			.446			.517		
Chi[2]	1402.03			2659.89**			162.54**			622.62**			834.47**		
N	775			775			775			775			775		

*p<.05. **p<.01.

4.3.4 Multivariate regression model with SUE estimation

As indicated in Chapter 4.3.3, the SUE estimation model consists of two procedures. The first procedure estimates coefficients of parameters using a multivariate regression model. Then the second step estimates the variance and covariance using sandwich-estimators to conduct the t-test for estimated coefficients. Table 4-21 presents SUE estimation results. R-square is 644, .774, .173, .445, and .197, respectively.

However, the SUE estimation model has a limitation. In the multivariate regression model, the basic condition is each equation in an equation system should have the same independent variables. Yet in the present research, the researcher put a natural factor variable in the environmental QOL model to control outliers of the SURE model. Thus, the SURE model has different numbers of independent variables over the equations. To satisfy the SUE model condition, the researcher needed to eliminate the outlier variable. However, such a treatment limits theory-based research, leading data-driven research. To overcome such a limitation, the researcher considered the SURE model with ML estimation.

Table 4-21: Multivariate regression with SUE estimation

	Material QOL			Social QOL1			Social QOL2			Social QOL3			Environmental QOL		
	β	R.SE	z	β	R.SE	z	β	R.SE	z	β	R.SE	z	β	R.SE	z
NAICS_11	-0.112**	0.029	-3.84	0.030	0.027	1.10	0.099**	0.028	3.49	0.034	0.034	1.00	0.083**	0.031	2.65
NAICS_21	0.044	0.028	1.58	-0.07**6	0.024	-3.23	0.045	0.029	1.55	0.004	0.027	0.13	0.111**	0.050	2.20
NAICS_22	-0.134**	0.043	-3.13	-0.162**	0.037	-4.38	-0.013	0.043	-0.30	0.037	0.046	0.79	-0.058	0.051	-1.12
NAICS_23	1.371**	0.127	10.80	0.972**	0.114	8.51	0.283*	0.132	2.14	1.068**	0.160	6.66	0.655**	0.197	3.32
NAICS_31	-0.070	0.109	-0.64	0.079	0.089	0.89	-0.225*	0.088	-2.56	0.290**	0.102	2.86	0.015	0.108	0.14
NAICS_42	-0.206	0.126	-1.63	-0.188	0.097	-1.93	0.063	0.107	0.59	-0.392**	0.143	-2.75	-0.573**	0.160	-3.59
NAICS_44	-0.398	0.241	-1.65	-1.134**	0.201	-5.65	0.441*	0.218	2.03	-0.546*	0.257	-2.13	0.576*	0.280	2.05
NAICS_48	0.096	0.101	0.95	-0.307**	0.072	-4.29	-0.106	0.098	-1.08	0.043	0.100	0.43	-0.063	0.120	-0.53
NAICS_51	0.172	0.115	1.49	0.366**	0.092	3.97	-0.142	0.130	-1.09	0.340**	0.117	2.91	0.275*	0.118	2.32
NAICS_52	0.426**	0.157	2.72	0.037	0.134	0.27	0.149	0.182	0.82	0.011	0.190	0.06	0.222	0.205	1.09
NAICS_53	-0.867**	0.135	-6.43	-0.551**	0.123	-4.48	0.131	0.134	0.98	-1.108**	0.221	-5.02	-0.296	0.142	-2.08
NAICS_54	0.964**	0.167	5.78	0.909**	0.139	6.52	0.293	0.172	1.70	0.036	0.195	0.19	-0.157	0.177	-0.89
NAICS_55	0.015	0.059	0.25	0.086	0.051	1.68	0.127	0.067	1.90	-0.033	0.065	-0.50	-0.097	0.056	-1.74
NAICS_56	0.232	0.157	1.47	0.215	0.159	1.36	0.132	0.175	0.76	-0.278	0.210	-1.32	0.273	0.174	1.57
NAICS_61	0.188*	0.091	2.06	0.397**	0.073	5.42	0.083	0.107	0.78	0.157	0.088	1.79	-0.066	0.111	-0.60
NAICS_62	-0.992**	0.163	-6.07	-0.239	0.142	-1.68	-0.374*	0.165	-2.26	-0.226	0.168	-1.35	-0.144	0.173	-0.83
NAICS_71	0.461**	0.103	4.48	0.585**	0.093	6.30	0.188	0.118	1.60	0.607**	0.123	4.95	0.104	0.160	0.65
NAICS_72	-0.299	0.203	-1.47	0.451**	0.158	2.86	-0.364	0.195	-1.87	-0.473*	0.208	-2.28	-0.159	0.276	-0.57
NAICS_81	0.260	0.191	1.36	0.268	0.180	1.49	-0.478*	0.213	-2.25	0.290	0.224	1.29	0.224	0.216	1.04
Rural-urban continuum code	-0.520**	0.076	-6.89	-0.101	0.063	-1.60	-0.058	0.099	-0.58	0.047	0.075	0.64	-0.080	0.088	-0.91
Farm-dependent	-0.446	0.404	-1.10	-0.239	0.286	-0.83	-0.051	0.373	-0.14	-0.168	0.345	-0.49	0.335	0.315	1.06
Mining-dependent	0.634**	0.203	3.13	0.122	0.180	0.68	-0.087	0.189	-0.46	0.566**	0.184	3.08	0.211	0.195	1.08
Manufacturing-dependent	0.161*	0.075	2.15	0.185**	0.063	2.93	0.184*	0.089	2.06	0.095	0.079	1.21	0.075	0.083	0.91
F/S government-dependent	0.052	0.107	0.48	0.161	0.091	1.76	0.045	0.082	0.55	-0.138	0.102	-1.35	-0.088	0.204	-0.43
Services-dependent	-0.056	0.085	-0.67	0.041	0.070	0.58	-0.022	0.074	-0.30	0.104	0.090	1.15	-0.028	0.094	-0.30
Non-metro recreation	-0.155	0.141	-1.10	-0.253*	0.103	-2.46	-0.228	0.123	-1.86	-0.025	0.124	-0.20	-0.530	0.332	-1.60
Retirement destination	-0.194*	0.097	-2.00	0.073	0.077	0.95	0.079	0.092	0.86	0.093	0.082	1.14	-0.108	0.169	-0.64
Constant	0.614	0.486	1.26	1.137**	0.404	2.81	0.824	0.519	1.59	0.848	0.484	1.75	-0.836	0.812	-1.03
R^2	.644			.774			.173			.445			.197		
F (27, 747)	50.05**			94.96**			5.80**			22.23**			6.56**		
N	775			775			775			775			775		

*p<.05. **p<.01. †Robust Standard Errors

4.3.5 SURE model with ML estimation

Applying ML estimation to the SURE model is a relatively new technique. Hayashi (2011) mentioned the possibility of applying ML estimation to SURE modeling in his work and the present research utilized such a method by applying an advanced function of Stata 13. One of the benefits of ML estimation yields robust standard errors from ML, overcoming heteroskedasticity issues in the model. In the present research, such an approach is beneficial because the research model considers the interrelationships among residuals of each QOL model and the existence of a natural factor in the simultaneous regression model. Table 4-22 shows estimation results of the SURE model with ML estimation.

Table 4-22: SURE model with ML estimation

	Material QOL			Social QOL1			Social QOL2			Social QOL3			Environmental QOL		
	β	R.SE†	z	β	R.SE†	z	β	R.SE†	z	β	R.SE†	z	β	R.SE†	z
NAICS_11	-0.112**	0.029	-3.84	0.030	0.027	1.10	0.099**	0.028	3.49	0.034	0.034	1.00	0.074**	0.026	2.85
NAICS_21	0.044	0.028	1.58	-0.076**	0.024	-3.23	0.045	0.029	1.55	0.004	0.027	0.13	0.114**	0.040	2.85
NAICS_22	-0.134**	0.043	-3.13	-0.162**	0.037	-4.38	-0.013	0.043	-0.30	0.037	0.046	0.79	-0.056	0.043	-1.29
NAICS_23	1.371**	0.127	10.80	0.972**	0.114	8.51	0.283*	0.132	2.14	1.068**	0.160	6.66	0.488**	0.130	3.75
NAICS_31	-0.070	0.109	-0.64	0.079	0.089	0.89	-0.225*	0.088	-2.56	0.290**	0.102	2.86	-0.046	0.084	-0.54
NAICS_42	-0.206	0.126	-1.63	-0.188	0.097	-1.93	0.063	0.107	0.59	-0.392**	0.143	-2.75	-0.353**	0.111	-3.19
NAICS_44	-0.398	0.241	-1.65	-1.134**	0.201	-5.65	0.441*	0.218	2.03	-0.546*	0.257	-2.13	0.179	0.190	0.94
NAICS_48	0.096	0.101	0.95	-0.307**	0.072	-4.29	-0.106	0.098	-1.08	0.043	0.100	0.43	-0.038	0.091	-0.42
NAICS_51	0.172	0.115	1.49	0.366**	0.092	3.97	-0.142	0.130	-1.09	0.340**	0.117	2.91	0.403**	0.098	4.11
NAICS_52	0.426**	0.157	2.72	0.037	0.134	0.27	0.149	0.182	0.82	0.011	0.190	0.06	-0.036	0.156	-0.23
NAICS_53	-0.867**	0.135	-6.43	-0.551**	0.123	-4.48	0.131	0.134	0.98	-1.108**	0.221	-5.02	-0.092	0.138	-0.67
NAICS_54	0.964**	0.167	5.78	0.909**	0.139	6.52	0.293	0.172	1.70	0.036	0.195	0.19	-0.350*	0.140	-2.49
NAICS_55	0.015	0.059	0.25	0.086	0.051	1.68	0.127	0.067	1.90	-0.033	0.065	-0.50	-0.139**	0.047	-2.93
NAICS_56	0.232	0.157	1.47	0.215	0.159	1.36	0.132	0.175	0.76	-0.278	0.210	-1.32	0.171	0.134	1.28
NAICS_61	0.188*	0.091	2.06	0.397**	0.073	5.42	0.083	0.107	0.78	0.157	0.088	1.79	0.002	0.078	0.03
NAICS_62	-0.992**	0.163	-6.07	-0.239	0.142	-1.68	-0.374*	0.165	-2.26	-0.226	0.168	-1.35	-0.036	0.140	-0.26
NAICS_71	0.461**	0.103	4.48	0.585**	0.093	6.30	0.188	0.118	1.60	0.607**	0.123	4.95	0.202*	0.096	2.11
NAICS_72	-0.299	0.203	-1.47	0.451**	0.158	2.86	-0.364	0.195	-1.87	-0.473*	0.208	-2.28	-0.159	0.224	-0.71
NAICS_81	0.260	0.191	1.36	0.268	0.180	1.49	-0.478*	0.213	-2.25	0.290	0.224	1.29	0.202	0.192	1.05
Rural-urban continuum code	-0.520**	0.076	-6.89	-0.101	0.063	-1.60	-0.058	0.099	-0.58	0.047	0.075	0.64	-0.095	0.066	-1.43
Farm-dependent	-0.446	0.404	-1.10	-0.239	0.286	-0.83	-0.051	0.373	-0.14	-0.168	0.345	-0.49	0.084	0.301	0.28
Mining-dependent	0.634**	0.203	3.13	0.122	0.180	0.68	-0.087	0.189	-0.46	0.566**	0.184	3.08	0.128	0.164	0.78
Manufacturing-dependent	0.161*	0.075	2.15	0.185**	0.063	2.93	0.184*	0.089	2.06	0.095	0.079	1.21	0.063	0.072	0.88
F/S government-dependent	0.052	0.107	0.48	0.161	0.091	1.76	0.045	0.082	0.55	-0.138	0.102	-1.35	-0.136	0.152	-0.89
Services-dependent	-0.056	0.085	-0.67	0.041	0.070	0.58	-0.022	0.074	-0.30	0.104	0.090	1.15	0.004	0.075	0.05
Non-metro recreation	-0.155	0.141	-1.10	-0.253*	0.103	-2.46	-0.228	0.123	-1.86	-0.025	0.124	-0.20	-0.389	0.212	-1.83
Retirement destination	-0.194*	0.097	-2.00	0.073	0.077	0.95	0.079	0.092	0.86	0.093	0.082	1.14	0.030	0.098	0.30
Mega city													-1.122	0.707	-1.59
Outlier													-5.106**	0.999	-5.11
Constant	0.614	0.486	1.26	1.137**	0.404	2.81	0.824	0.519	1.59	0.848	0.484	1.75	0.313	0.433	0.72
R^2	.664			.774			.173			.445			.514		
Chi-sq.	1302.51			2896.30			179.33			505.26			387.21		
Wald test results[1)]	p<.001**			p<.001**			p<.001**			p<.001**			p<.001**		
N	775			775			775			775			775		

*p<.05. **p<.01. †Robust Standard Errors [1)] The null hypothesis of this test is that coefficients other than the intercepts are 0.

4.4 Hypotheses testing

The present study proposed several research models to test hypotheses. The proposed models are OLS, OLS with robust standard errors, the SURE model, multivariate regression with SUE estimation, and the SURE model with ML estimation. After conducting model diagnostic tests and considering limitations of each model, the research concluded that the SURE model with ML estimation was optimal for the present research.

To decide which research model is suitable, the researcher set up two model selection criteria. The first was that the research model should consider interrelationships among QOL models. As shown in Table 4-19, the QOL domains are related to each other. Such interrelationships should be considered when the parameters are estimated.

The second was that the selected research model should overcome any heteroskedasticity issue. Heteroskedasticity is a common phenomenon in cross-sectional data research. Even though such an issue does not affect estimation of coefficients of research models, it affects estimation of standard errors, resulting in incorrect statistical decisions for hypothesis testing. Given that selection criteria, the SURE model with ML estimation is the optimal research model since it satisfies both criteria.

Before testing research hypotheses using statistical results from ML estimation in the SURE model, the significance of the research model was tested by Wald test results as shown in Table 4-22. According to results, all QOL models are significant. Wald test's null hypothesis is that coefficients are 0. Wald test statistics rejected such a null hypothesis. The significance of each parameter estimate was tested by z-test. The present research used large sample data and ML estimation, producing z-score for statistical testing.

4.4.1 Hypothesis test for the material QOL model

H1-A: The hospitality and tourism industry affects the material domain of community quality of life.

H1-A is partially accepted. According to the statistical results, the hospitality and tourism industry positively affects the material QOL domain of community QOL. In Table 4-22, the coefficient of NAICS_71 is 0.461; if one percent of tourism business establishments per capita increases, the material QOL index will increase by 0.461 units. However, the coefficient of NAICS_72 is insignificant.

H1-B: Community characteristics affect the material domain of community quality of life.

H1-B is accepted. The statistical results show that rural communities have less material QOL index. As the Rural-Urban Continuum score increases, the material QOL index decreases. Mining-dependent counties and manufacturing-dependent counties also show high material QOL index.

4.4.2 Hypothesis test for Social QOL model

H2-A: The hospitality and tourism industry affects the social domain of community quality of life.

H2-A is partially accepted. According to the results, the hospitality and tourism industry affects social QOL in various ways. Social QOL consists of three components (Table 4-5): overall social QOL, subjective QOL, and safety-related QOL. Table 4-22 shows that the hospitality and tourism industry affects social QOL indices. For example, the coefficients of NAICS_71 and NAICS_72 are 0.585 and 0.451 respectively, indicating that the hospitality and tourism industry positively affects overall social QOL. They are all statistically significant. However, in the subjective social QOL model, both coefficients are statistically insignificant, indicating that the hospitality and tourism industry does not affect subjective social QOL.

In the social safety model, the coefficients of NAICS_71 and NAICS_72 are 0.607 and -0.473 respectively, suggesting that the hospitality and tourism industry affects the social safety index in mixed ways. More detailed explanation is provided in the discussion session.

H2-B: Community characteristics affect the social domain of community quality of life.

H2-B is accepted. Some of community characteristics indicators are statistically significant. For example, in the overall social QOL model, the coefficient of the manufacturing-dependent counties is 0.185, meaning that they have a relatively high level of overall social QOL compared to non-specialized counties. However, non-metro recreation counties show a relatively low level of overall social QOL as opposed to non-specialized counties.

For the subjective QOL model, Manufacturing-dependent counties also show a relatively high level of subjective QOL index compared to non-specialized counties. Concerning the safety-related QOL index, mining-dependent counties show a high level of the QOL index. These results support that community characteristics affect the social QOL indices.

4.4.3 Hypothesis test for the environmental QOL model

<u>H3-A: The hospitality and tourism industry affects the environmental domain of community quality of life.</u>

H3-A is partially accepted. Table 4-22 shows that the coefficient of NAICS_71 is 0.202 and statistically significant. However, the coefficient of NAICS_72 in the environmental QOL model is insignificant. That means that an important sector of the hospitality and tourism industry affects the environmental QOL.

<u>H3-B: Community characteristics affect the environmental domain of community quality of life.</u>

H3-B is rejected. No community characteristic indicator is statistically significant. Community social and economic characteristics do not affect the environmental QOL level.

<u>H3-C: Outlier factors affect the environmental domain of community quality of life.</u>

H3-B is accepted. As shown in Table 4-22, the outlier factor indicator (i.e. natural and social factors) is statistically significant.

4.4.4 Hypothesis test for interrelationships among QOL domains

<u>H4-A: All QOL domains are interrelated.</u>

H4-A is accepted. Table 4-19 shows that QOL models' residuals are correlated. The Breusch-Pagan test of independence statistically confirmed that residuals are correlated, indicating QOL domains are interrelated.

CHAPTER 5. DISCUSSION AND CONCLUSIONS

The primary goals of the present research were two-fold. The first was to build tourism-related QOL indices to establish an analytical framework for tourism impact research. The second was to investigate the impacts of the hospitality and tourism industry on community QOL using developed tourism-related QOL indices.

To achieve these goals, a theoretical foundation was introduced in Chapter 2. In Chapter 3, the researcher suggested research methods. In the chapter before this one, model diagnostic test results and statistical results were presented to test research hypotheses. In the current chapter, research findings and the meaning of those results are discussed. At the end of the chapter, conclusions and limitations are presented.

5.1 Summary of key findings

5.1.1 PCA results

Using tourism impact theories (Andereck et al., 2005; Ap & Crompton, 1998), the present researcher conceptualized tourism-related QOL domains by features of tourism impacts on community QOL. Community QOL consists of three sub-domains: material (economic), social, and environmental. For the material and social QOL domains, the researcher conducted PCA on QOL indicators to identify potential QOL components within QOL domains. For the environmental QOL domain, the researcher used the AQI as a proxy indicator for measuring environmental QOL because AQI is an index that consists of five air pollutant indicators.

According to PCA results, material QOL can be measured by a uni-dimensional QOL index. Household income, non-poverty rate, and employment rate at the county level contribute to the construction of a material QOL index. With respect to the social QOL domain, it consists of three social QOL components: "overall social QOL ", "subjective QOL", and "safety-related QOL". Both objective and subjective indicators (e.g. educational achievement, average life expectancy, voter turnout rate, life satisfaction, perceptions of social and emotional support from friends and family, and safety) contribute to building social QOL indices in the same database. Such an approach overcomes limitations of only objective and subjective indicator approaches. Generated indices act as dependent variables to measure the impacts of hospitality and tourism on community QOL.

5.1.2 Impacts of the hospitality and tourism industry on community QOL

According to statistical results shown in Table 4-22, the hospitality and tourism industry affects community QOL in various ways. For example, NAICS 71 (i.e. the arts, entertainment, and recreation sectors) positively affects the material QOL domain of community QOL. However, NAICS 72 (i.e. accommodations and food service sectors) does not affect the material QOL domain.

The hospitality and tourism industry also affects the social QOL domain both positively and negatively. Within the social QOL domain, there are three sub-components: overall social QOL, subjective social QOL, and safety-related QOL. Both NAICS 71 and NAICS 72 positively affect the overall social QOL index. However, NAICS 72 negatively affects the safety-related social QOL index even though NAICS 72 positively affect it. Neither NAICS 71 nor NAICS 72 affects the subjective social QOL index.

Regarding the environmental QOL domain, NAICS 71 positively affect the environmental QOL domain, but NAICS 72 does not have such an impact on it. Among various community characteristic factors, the outlier variable is a significant factor to affect the environmental QOL domain.

5.1.3 Influence of community characteristics on community QOL

Community characteristics, also called place-based variables, affect community QOL. According to the results, some variables representing rural-related characteristics (e.g. rural-urban continuum score and non-metro recreational county) show negative influences on the material QOL and social QOL domains. Contrary to previously mentioned community characteristics, mining-dependent counties and manufacturing-dependent counties show positive influences on the material and social QOL domains.

5.1.4 Interrelationship among QOL domains

One of the most important findings of the present research is that QOL domains are related to each other. According to BP test results, QOL domains are interrelated. Therefore, tourism-related QOL research should consider such a relationship when building a theoretical model for tourism-related QOL.

5.1.5 Confirmation of conceptual research model

As shown in Figure 2-1 in page 56, the present researcher proposed a conceptual model and verified it with empirical results. Major research findings are summarized from Chapter 5.1.2 to 5.1.4. The findings indicate that the hospitality and tourism industry is one of the major forces to affect community QOL. The industry positively affects material, social, and environmental QOL.

5.2 Discussion

The present research analyzed the impacts of the hospitality and tourism industry on community QOL using the SURE model. Community QOL consists of three different QOL sub-domains: material, social, and environmental. The SURE model revealed that the industry positively affects the material QOL of communities. Because the present research is the first tourism-related QOL research that used objective and subjective indicators at the county level, comparison of past and present research findings is difficult. Therefore, the study used the research findings of both the objective and subjective indicator approach on community QOL.

5.2.1 Impacts of the hospitality and tourism industry on community QOL

The theoretical foundations of the present research are social utility theory and tourism impact theory. Such theories insist that tourism phenomena are a social power to shape society and resident QOL. Based on this concept, many tourism scholars have explored tourism impacts on local communities. The present research is on the cutting edge of current tourism knowledge, validating the findings of previous research that investigated community and national level QOL. Moreover, the present research suggested how tourism affects community QOL by comparing previous findings. Compared with previous works (Chancellor et al., 2011; Kim et al., 2013; Meng et al., 2010; Webster & Ivanov, 2014), the present research showed similar results that tourism positively affects the material QOL index. The material QOL index consists of three indicators: household median income, community employment rate (1-unemployment rate), and non-poverty rate (1-poverty rate). Even though Kim et al.'s work (2013) relied on residents' perceptions of community QOL, measurement items for the residents' perceptions asked about job-related and revenue-related conditions, indicating that tourism development positively affects such conditions. Chancellor et al.'s work (2011) also showed that tourism creates more job opportunity for a community. However, these studies were based on survey data from limited areas, making it difficult to generalize the findings. For example, Chancellor et al. (2011) investigated only one county (Orange County in Indiana), and Kim et al. (2013) examined community QOL across 15 counties in Virginia. Such is a typical limitation of survey-based research. However, the present research validated their findings. Meng et al.'s work (2010) also supported research findings of previous tourism-related QOL. They conducted research at the regional level, suggesting that tourism development can affect regional QOL. However, generalizing such a finding in QOL research at the community level is difficult when communities have different characteristics and vary concerning the extent to which tourism has developed. This is a common limitation of research that uses objective social indicators.

Concerning social impacts of the hospitality and tourism industry on community QOL, the present research showed somewhat contradictory results. According to the hypotheses test results, the hospitality and tourism industry positively affects overall social

QOL index, but it negatively affects the safety-related social QOL index: this is consistent with previous findings. For example, Andereck and Nyaupane (2011b) reported that tourism generally enhances community residents' QOL, but it negatively affects safety-related QOL. Such findings have been confirmed in many tourism social impact studies (Chancellor et al., 2011; Choi & Murray, 2010). However, Cui and Ryan (2011) contended that the hospitality and tourism industry does not affect the safety level of local communities. According to estimation results of the present research, hospitality and tourism affects safety-related QOL in mixed ways. For example, as NAICS 72 business establishments increases by 1%, safety-related QOL index changes by -0.473 units. When 1% of NAICS 71 business establishments increases, the safety-related QOL index changes by 0.607 units. Given the overall benefits of the hospitality and tourism industry and mixed effects, tourism development eventually improves social QOL. If a local government pays attention to safety, the safety issue is manageable. Such a finding is unique because previous studies of perception-oriented research do not provide this information to policy makers and community leaders. Residents' perception information can provide a direction of either negative or positive, but it does not provide quantified information essential for policy or community decisions.

The environmental impacts of tourism on community QOL are also contradictory to previous findings (T. H. Lee, 2013; Saenz-de-Miera & Rosselló, 2014). According to hypothesis results, the hospitality and tourism industry positively affects the environmental QOL domain of community QOL. Even though NAICS 72 does not affect the environmental QOL index, NAICS 71 positively affects it. These findings show contradictory results to previous research. For example, Lee (2013) investigated resident's perceptions about tourism impacts, suggesting that local residents perceived tourism as a negative factor to the environment. That perception negatively affects support for tourism development. Saenz-de-Miera and Rosselló (2014) also reported that the tourism industry negatively affects environmental QOL. They investigated the relationship between an air pollution indicator (PM10 concentrations) and the number of tourists in Mallorca, Spain. They argued that tourism is responsible for air pollution and environmental degradation. However, their research was based on one geographical area and only PM10 information, one of air pollutant indicators. Thus, one finds it difficult to generalize their findings. Contrary to their research, the present research used AQI, consisting of five air pollutants: ground-level ozone, particle pollution (PM10 and PM2.5), carbon monoxide, sulfur dioxide, and nitrogen dioxide. Survey areas included about 1,000 counties in the United States. As described in page 54, the five air pollutants are closely related with natural factors and human activities. Because tourism is one of the major human activities, it could be assumed that tourism is more likely to affect these air pollutants. However, research findings of the present study indicate that, compared to other industries, the hospitality and tourism industry positively affects the environmental QOL index. It turned out that climate and natural factors are significant variables affecting the environmental QOL index rather than human activities.

5.2.2 Interrelationship among QOL domains

The interrelationships among QOL domains were tested, and results are shown in Table 4-19. This finding is very important to both subjective and objective indicator approaches in QOL research. Most QOL studies assume multi-dimensionality of QOL domains (Berenger & Verdier-Chouchane, 2007; Cummins, 2005; Felce & Perry, 1995;

Potter et al., 2012). However, few studies assumed relationships among QOL domains (Kim et al., 2013; Neal, Sirgy, & Uysal, 2004), indicating hypothetical relationships among QOL constructs.

For the subjective indicator approach (perception-oriented research), when researchers construct a hypothetical model of residents' perceptions, they should consider interrelationships among QOL constructs to reflect a precise mechanism of a QOL framework. For example, Kim et al. (2013) conceptualized community QOL domains as four dimensions, arguing that they affect overall life satisfaction. However, they did not consider interrelationships among particular QOL domains. One can more reasonably assume that the particular QOL domains are related because life domains are not independent.

For the objective indicator approach, when researchers estimate coefficients of each model, they should consider such interrelationships among QOL equations. As demonstrated in Chapter 4, such consideration results in different statistical outcomes. Thus, without assuming interrelationships among QOL domains, estimation results could be biased.

5.2.3 Influences of community characteristics on community QOL

Community characteristic variables provide important information about community QOL. According to results, rural-related variables (e.g. rural-urban continuum score and non-metro recreational county) show negative coefficients of their estimators for material and social QOL. Rural residents have suffered from less material and social QOL indices. Figure 5-1 shows Rural-urban Continuum Codes, 2003, indicating a rurality level of each county. The codes defined rural areas as open country and settlements with fewer than 2,500 residents; urban areas mean larger places and densely settled areas surrounding them. Such categorization also implies economic, social, and environmental QOL differences between rural and urban areas. For example, all rural-related variables indicated a negative coefficient of the overall social QOL index. The hospitality and tourism industry can mitigate such a negative impact because contrary to rural-related variables, the industry positively affects material and social QOL. Therefore, rural tourism is a useful tool for improving rural residents' and communities' QOL.

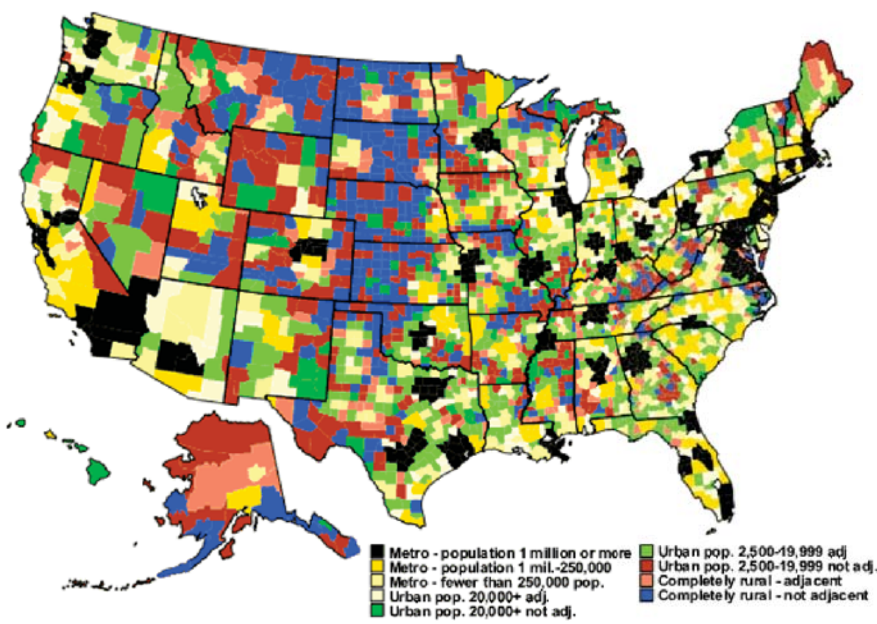

Figure 5-1: Rural-urban continuum codes, 2003 [2]

---

[2] Source: USDA, Economic Research Service

5.2.4 Specific research objectives as a research protocol

Initially, the present research proposed ten research objectives. These objectives could be used as a research protocol for conducting community-level research because the objectives are a goal of each research stage. For example, specific objectives are: 1) To review existing literature about tourism impacts on QOL, synthesizing new findings of hospitality and tourism-related QOL; 2) To propose a theoretical foundation about the impacts of the hospitality and tourism industry on hospitality and tourism-related QOL; 3) To identify potential data sources for hospitality and tourism-related QOL research; 4) To develop a community/county-level data integration method for examining social, economic, and environmental issues of tourism impacts; 5) To build a community-level QOL database of American counties by performing data integration with public domain datasets; 6) To construct QOL indices at the county-level by conducting a multivariate analysis method like Principal Component Analysis; 7) To develop an empirical research model for investigating the impacts of the hospitality and tourism industry on community QOL; 8) To empirically test the relationships among key QOL domains; 9) To estimate the impacts of the hospitality and tourism industry on community QOL; and 10) To determine the best estimation method by comparing results of various estimation models. The current research proceeded to achieve these goals.

5.3 Application of the present research: tourism impact simulation

One of the major contributions of the present research is to provide relevant information about tourism impacts on a local community. When tourism scholars and practitioners design a tourism project, such information helps them maximize positive benefits from tourism and minimize negative costs. In particular, a simulation approach is a typical application of tourism impact research, providing simple but insightful information about economic, social, and environmental consequences of tourism development. Estimation results of the present research are essential for tourism impact simulation.

With tourism impact simulation, economic impact research is one of the most popular topic. Its research methods are categorized into three approaches: Input-Output (IO) model, Social Account Matrix model, and Computable General Equilibrium (CGE) model. However, such models have some limitations. For example, most existing models focus on economic impacts, limiting consideration of social and environmental impacts. Given that a recent research trend is to expand a research scope from an economic area into social and environmental domains, such economic models could not contribute to understanding of social and environmental impacts of tourism.

In the United States, most tourism projects are performed at the local level. However, existing models are macro-economic in nature and are suitable for examining tourism impacts at the national and regional level. Specifically, American counties are responsible for tourism marketing projects for their areas, having an interest in the impacts of tourism because local community leaders and tourism practitioners consider tourism as an economic engine to boost community QOL. Therefore, one finds it necessary to develop and harness a tourism impact simulation model that includes economic, social, and environmental consequences at the local level. The present research can contribute to building the simulation model, filling such a research gap between national and local level studies. Practically, the present researcher developed an analytical model to estimate tourism impacts at the local level as shown in Chapter 4.3.5. The estimated coefficients could be used for constructing a tourism impact simulation model, illustrating potential contributions of tourism development to improve community QOL.

5.3.1 Simulation procedure

To perform simulation of tourism development, the present researcher used two steps. The first step was to build a base model using the tourism impact model that research estimated in the previous chapter. The author used the SURE model with maximum likelihood estimation of Chapter 4.3.5 as the base model, providing parameters for simulation.

The second step was to propose tourism development scenarios, estimating simulation results. The present researcher proposed three hypothetical scenarios to measure absolute and relative rank changes of community QOL indices. The first simulation scenario was a case where the hospitality and tourism business establishments increase by 10%. The second scenario was that the business establishments increase by 15 %. The third scenario was a case that the business establishments in a community increase by 20%. In the present research, these scenarios were used to analyze the changes of QOL indices between the base model and simulation model by three scenarios. Results are long-run comparative statics, assessing the impacts of tourism development on local communities.

5.3.2 Simulation results

Table 5-1 presents overall simulation results before describing QOL changes by different regions. Specific simulation results of 775 American counties are presented in Appendix C. Accordingly, as the hospitality and tourism business establishments increase, most QOL indices improve. Table 5-1 provides both absolute and relative rank changes to community QOL, highlighting the important role of tourism development.

Table 5-1: Simulation results of tourism impacts on community QOL

		Absolute changes			Relative rank changes		
	Base QOL	10%†	15%‡	20%ǂ	10%	15%	20%
Material QOL	0.639	0.683	0.704	0.723	3.17%	4.67%	6.13%
Social QOL1	0.674	0.773	0.819	0.863	7.02%	10.42%	13.74%
Social QOL2	0.159	0.159	0.159	0.159	0.00%	0.00%	0.00%
Social QOL3	-0.420	-0.408	-0.402	-0.396	1.11%	1.63%	2.13%
Environmental QOL	-0.111	-0.092	-0.083	-0.074	1.53%	2.25%	2.94%

† In the case of hospitality and tourism business establishments increase by 10%; ‡ in the case of hospitality and tourism business establishments increase by 15%; ǂ in the case of hospitality and tourism business establishments increase by 20%

To analyze changes in QOL domains, the present researcher introduced a new evaluative concept, a relative rank change. This is an indicator to describe the extent to which community's QOL rank order changes after tourism development. For example, Table 5-1 indicates that the average rank change of material QOL is 3.17% when the hospitality and tourism business establishments increase by 10%. Such results mean that community's rank order in material QOL will grow by 3.17% after 10% of the hospitality and tourism industry grows. When the industry grows by 20%, the relative rank order in the material QOL index will rise by 6.13 %.

For social QOL domains, as the hospitality and tourism business establishments increase by 10%, the average rank change of the social QOL1 index will be 7.02%. In the case of 20 % increase in terms of the number of business establishment, the average rank order rises by 13.74%. However, the social QOL2 index has not changed because the base model assumed that the hospitality and tourism industry does not affect the social QOL2 index.

The table also indicates that rank order changes in social QOL3 (safety-related social QOL) and environmental QOL are limited compared to the changes of material and social QOL1 indices. Such information provides a clear understanding of tourism impacts on community QOL. However, in simulation, the present researcher added some socio-geographical variables to analyze different tourism impacts by regions. The variables are classifications of urban and rural counties as well as coastal and non-coastal counties.

In the tourism literature, many scholars have investigated the differences of QOL levels between urban and rural counties (Chancellor et al., 2011; D'Hauteserre, 2001; Deller et al., 2001; Warnick, 2002). The urban-rural framework has become a crucial analytical point to understand tourism impacts. However, in QOL research, another social-geographical variable plays an important role in analyzing community QOL. The variable is a classification of coastal and non-coastal counties (Rappaport & Sachs, 2003). According to the National Oceanic and Atmospheric Administration (NOAA), 672 American counties are classified as coastal, harboring 54% of the population in the United States. Rappaport and Sachs (2003) contended that economic activity in the United States has centered on the coastal areas of its ocean and Great Lakes, contributing to economic prosperity and local residents' QOL. Coastal areas also have affluent tourism resources and local amenities. Therefore, the coastal and non-coastal classification could be an important variable to understand community QOL.

Using the classifications of urban and rural as well as coastal and non-coastal counties, the present researcher categorized sample counties into four groups: Urban Counties in Coastal Areas (UCCA), Urban Counties in Non-coastal Areas (UCNA), Rural

Counties in Coastal Areas (RCCA), and Rural Counties in Non-coastal Areas (RCNA). Categorization results are presented in Table 5-2.

Table 5-2: Classifications of sample counties

	Coastal	Non-coastal	
Urban	Urban - coastal counties (233)	Urban-non-coastal counties (320)	(553)
Rural	Rural-coastal counties (46)	Rural-non-coastal counties (176)	(220)
	(279)	(496)	773

5.3.3 Variations of QOL levels by socio-geographical characteristics

The present researcher reviewed simulation results by sample county classifications, based on two classification systems: rural classification code and NOAA' list of coastal counties. According to simulation results, absolute QOL levels and relative rank order changes vary by classification groups. More detailed explanation is presented in the following section.

Urban counties in coastal areas

Table 5-3 shows that American counties in urban-coastal areas have a high level of material and social QOL compared to other counties. However, the counties show a low level of environmental QOL. Regarding relative rank order changes of material and social QOL levels after simulation, the counties have a low rate of QOL changes compared to national averages. However, the counties indicate a high rate of environmental QOL changes compared to the national average rate. Such indication means that the tourism industry can contribute to improving the environmental QOL of urban counties in coastal areas.

Table 5-3: Simulation results of tourism impacts on urban counties in coastal areas

		Absolute changes			Relative rank changes		
	Base QOL	10%	15%	20%	10%	15%	20%
Material QOL	1.059	1.103	1.124	1.143	2.49%	3.66%	4.78%
Social QOL1	1.071	1.170	1.216	1.260	5.50%	8.12%	10.65%
Social QOL2	0.167	0.167	0.167	0.167	0.00%	0.00%	0.00%
Social QOL3	-0.563	-0.550	-0.544	-0.539	1.20%	1.76%	2.30%
Environmental QOL	-0.149	-0.130	-0.121	-0.112	1.59%	2.34%	3.07%

Urban counties in non-coastal areas

Table 5-4 presents that the average QOL levels of urban counties in non-coastal areas are similar to the national averages of QOL indices except environmental QOL. However, its changing rates of relative rank order are different from national average rates. For example, change rates of material and social QOL1 are lower than the national average, but the change rates of social QOL3 and environmental QOL are higher than national average rates. Therefore, if a county in rural and non-coastal areas suffers from environmental degradation, tourism development may be a viable solution for improving community QOL.

Table 5-4: Simulation results of tourism impacts on urban counties in non-coastal areas

		Absolute QOL index changes			Relative rank changes		
	Base QOL	10%	15%	20%	10%	15%	20%
Material QOL	0.749	0.793	0.813	0.833	2.92%	4.30%	5.63%
Social QOL1	0.681	0.779	0.825	0.870	6.92%	10.26%	13.52%
Social QOL2	0.240	0.240	0.240	0.240	0.00%	0.00%	0.00%
Social QOL3	-0.608	-0.595	-0.589	-0.583	1.27%	1.86%	2.43%
Environmental QOL	-0.266	-0.246	-0.237	-0.229	1.74%	2.56%	3.36%

Rural counties in coastal areas

Rural counties in coastal areas have various tourism resources and potential for tourism development. Given that positive tourism impacts on community QOL, coastal and marine tourism could be a key to improve QOL in rural communities. According to simulation results, overall QOL levels of rural counties are lower than national averages. However, social QOL2 (i.e. subjective wellbeing) and environmental QOL level are higher than the national average. In particular, the tourism industry is more likely to improve social QOL indices as it grows. If hospitality and tourism business establishments increase by 10%, counties' relative rank change in the material QOL index will grow by 4.20%. When industry business establishments increase by 20%, the index would grow by 8.14%. Such changing rates are higher than national averages. Accordingly, tourism development in rural and coastal areas is more effective than in other areas.

Table 5-5: Simulation results of tourism impacts on rural counties in coastal areas

		Absolute changes			Relative rank changes		
	Base QOL	10%	15%	20%	10%	15%	20%
Material QOL	0.042	0.086	0.106	0.126	4.20%	6.20%	8.14%
Social QOL1	0.567	0.666	0.712	0.756	7.34%	10.89%	14.37%
Social QOL2	0.263	0.263	0.263	0.263	0.00%	0.00%	0.00%
Social QOL3	-0.087	-0.075	-0.069	-0.063	0.88%	1.29%	1.69%
Environmental QOL	0.027	0.046	0.055	0.063	0.99%	1.45%	1.88%

Rural counties in non-coastal areas

A rural county in non-coastal areas has been considered as a traditional rural community and a foundation of American society. Its economic structure has relied on agriculture. However, that structure has suffered from significant changes over the past three decades (Deller et al., 2001). With respect to such a phenomenon, rural tourism has been suggested as a solution to revitalize rural economy and society.

As shown in Table 5-6, most QOL indices of the rural communities are lower than national averages. However, potential contributions of tourism development to improving overall social QOL are tremendous. For example, as hospitality and tourism business establishments increase by 10%, the relative rank order grows by 9.14%, higher than the national average. Given that overall social QOL is a basis for rural society, results suggest that tourism development is a viable option for sustainable rural development.

Table 5-6: Simulation results of tourism impacts on rural counties in non-coastal areas

		Absolute changes			Relative rank changes		
	Base QOL	10%	15%	20%	10%	15%	20%
Material QOL	0.039	0.083	0.104	0.123	4.25%	6.29%	8.27%
Social QOL1	0.165	0.263	0.309	0.353	9.14%	13.62%	18.06%
Social QOL2	-0.027	-0.027	-0.027	-0.027	0.00%	0.00%	0.00%
Social QOL3	0.022	0.035	0.041	0.046	0.77%	1.14%	1.48%
Environmental QOL	0.184	0.203	0.212	0.221	1.20%	1.77%	2.31%

5.3.4 Summary of QOL simulation

Using a comparative statics approach, the present researcher simulated QOL changes through tourism development. To construct a simulation model, results from the tourism impact model of Chapter 4.3.5 were used. To investigate QOL changes, three different tourism development simulation scenarios were proposed. With the combination of the simulation model and scenarios, the present researcher examined QOL changes by different tourism development cases, confirming significant contributions of tourism development to improve community QOL.

According to simulation results, among five community QOL domains, social QOL1 (i.e. overall social QOL) is the most improved QOL domain with the material QOL domain next. In addition, the author found that absolute changes of QOL levels vary by socio-geographical classifications. Specifically, urban counties in coastal areas have a high level of QOL. Yet rural counties in non-coastal areas have a low level of QOL indices. However, the sample counties' relative rank change rate is higher than that of other areas, suggesting that rural tourism development is a more effective option for rural communities.

The simulation added two more contributions to the present research. By analyzing simulation results, the author proposed a new evaluative concept, a relative rank change. The concept helps tourism researchers and policy makers understand tourism impacts and potential for improving community QOL because the concept can quantify relative changes of QOL indices in a simple way. Another contribution is that the present research simulated QOL changes of 755 American counties, providing practical references to expected tourism impacts on community QOL. The simulation results also function as a reference for the evaluation of tourism projects. Simulation results of the sample counties are presented in Appendix C. When policy makers and tourism practitioners want to know expected consequences of tourism development on their communities, results would provide straightforward information about tourism impacts. Specifically, simulation results in Appendix C. can play as a platform for predicting consequences of tourism development and social, economic, and natural changes of a local community. The simulation model includes 775 American counties' information, covering the majority of the U.S. population. The simulation model allows ordinary users to run simulations on a variety of social and economic changes of a community. Additionally, QOL simulation results are useful for tourism impact analysis when an econometric approach is not feasible because of data limitations.

5.4 Conclusions

The purpose of Chapter 5 was to answer the research question: "Does the hospitality and tourism industry affect community QOL?". In Chapter 4, statistical results were provided, suggesting that the hospitality and tourism industry affects community QOL domains in a mixed way. The results implied that community QOL domains are interrelated. Tourism researchers should consider such a relationship when they conduct tourism-related QOL research at the individual and/or community levels. In addition, the present research yielded theoretical, methodological, and practical contributions, providing meaningful theoretical, policy, and practical implications. They are presented in the following sections.

5.4.1 Contributions

The study contributes to tourism academia and local communities in three ways. Theoretically, the present research reconciled tourism impact theory and QOL theory in a community QOL framework. It suggests a new way to examine tourism impacts on local communities. Previous research investigated tourism-related QOL from the QOL research framework, attempting to analyze tourism phenomena using QOL theories. However, the present research proposed that it is easier to understand tourism phenomena after reconciling tourism and QOL theories. Despite little modification of tourism-related QOL theory, research results of the present study provide valuable insight that is different from that of previous research. For example, the present research identified tourism-related QOL domains as economic, social, and environmental. Such categorization is based on tourism impact theory. The present researcher also recognized they are interrelated, contributing to theoretical model building for tourism-related QOL.

Methodologically, the present research demonstrated how to build community-level QOL indices in a systematic way using public domains data sets. The researcher also showed how to use an equation system for estimating multidimensional impacts of tourism on community QOL domains. Such an approach is an innovative way to investigate tourism impacts on local communities; the present research is the first to consider multidimensional aspects simultaneously and to reconcile objective and subjective indicators of QOL research at the local level. As previously mentioned, interrelationships among QOL domains should be considered. The present research provides a guide to deal with such a condition. Moreover, the present researcher showed analytical strategies to eliminate common estimation obstacles such as heteroscedasticity, unequal independent variables in an equation system, and interrelationships among multiple equations.

Practically, one output of the research is a community-level QOL database. It should be helpful when policy makers and community leaders consider tourism as a community economic development tool and evaluate tourism impacts on their communities. For example, in the United States, tourism marketing and activities are performed at the county level. Most counties have their own tourism marketing department. Limited information about tourism impacts at the county level is available. Federal government agencies produce some key information about QOL-related topics. The information is scattered and disorganized. However, the generated database and indices summarize various QOL information into three universal indices: economic, social, and environmental. They provide clear interpretations about the impact of the hospitality and tourism industry on community QOL. In Chapter 5.3, the author demonstrated how to use the community-level QOL database. It could be a basis for simulation of QOL changes by tourism development, providing information about potential consequences of tourism development with less effort than conventional research activities. This is one of the main contributions of the present research.

5.4.2 Implications

Implications of the present study are closely related to findings and contributions. The present research suggests theoretical, policy, and practical implications. Theoretically, the present research suggested that community QOL is multi-dimensional, but its sub-domains are interrelated. The present researcher also suggested considering interrelationships among QOL domains when conducting QOL research. However, previous QOL research did not consider interrelationships among QOL constructs, assuming they are independent. Such a viewpoint could lead to biased results because policy makers and community leaders can prioritize among QOL domains, emphasizing one aspect of QOL domains. However, if QOL domains are interrelated, policy makers and community leaders should carefully consider their prioritizing of QOL domains.

For policy implications, the present research discovered the impacts of tourism on community QOL, examining the influences of community characteristics of a QOL model. For rural communities, both findings suggested crucial policy implications. According to results, rural communities have suffered from some disadvantages (i.e. economic and social), which could threaten the sustainability of a rural community. However, research results showed that rural tourism could be a remedy for the disadvantages of rural communities. Specifically, rural communities show a low level of material and social QOL indices. However, tourism improves the material and social QOL indices. Therefore, one can conclude that rural tourism is a key for relieving such disadvantages in rural areas. Simulation results in Chapter 5.3 also confirmed such implications. Therefore, if rural tourism is promoted, rural communities can be revitalized.

Practically, the present research suggests an important implication. Conventional tourism impact studies tend to rely on survey information, requiring time, money, and efforts. Therefore, policy makers and community leaders need to invest in such research activities for academic and professional research outcomes. However, there is a potential obstacle for a community with limited resources when community leaders need information about tourism impacts for their location. However, the present research suggested that using a community-level QOL database, generated from existing public domains data sets, can produce meaningful information without investing much time, money, and effort. Moreover, tourism impact simulation, based on the tourism impact model, offers intuitive and reliable references for potential consequences of tourism development on local communities and residents. For example, community leaders and tourism planers want to know potential tourism impacts on their community and residents before establishing tourism projects because tourism has been used as a tool to improve QOL of a community. Without proper information of tourism impacts, it is quite difficult for community leaders and policy makers to decide how to harness tourism as a policy instrument. Moreover, simulation results would be a reference to the evaluation of tourism development after conducting tourism projects. Such information is essential for tourism project planning.

5.5 Limitations and future research

The present study has research limitations. The study used objective social indicators and survey results that were relevant to community QOL. Compared to existing social indicators, objective indicators could be exploratory. For example, the present research used AQI as a proxy variable for measuring environmental QOL. Even though AQI is a common index for measuring environmental QOL, it could not cover all aspects of environmental quality. If there were a more comprehensive indicator for environmental QOL, research results could be more informative.

Also the present research did not cover all counties in the United States due to limited observations of objective and subjective social indicators. For example, the BRFSS survey covers approximately 2,000 counties. Concerning the AQI index, information is available for 1,000 American counties. With such limited observations, the present researcher analyzed 775 sample counties; the sample size is large enough to investigate the impacts of the hospitality and tourism industry on community QOL. The data set is the most comprehensive database at the community level QOL. Given that federal government agencies are expanding their observations for various objective social indicators, future research on community QOL will expand research observations and overcome such a limitation.

LIST OF REFERENCES

LIST OF REFERENCES

Ahn, B., Lee, B., & Shafer, C.S. (2002). Operationalizing sustainability in regional tourism planning: An application of the limits of acceptable change framework. *Tourism Management, 23*(1), 1-15.

Allen, L.R., Hafer, H.R., Long, P.T., & Perdue, R.R. (1993). Rural residents' attitudes toward recreation and tourism development. *Journal of Travel Research, 31*(4), 27-33.

Allen, L.R., Long, P.T., Perdue, R.R., & Kieselbach, S. (1988). The impact of tourism development on residents' perceptions of community life. *Journal of Travel Research, 27*(1), 16.

Andereck, K.L., & Nyaupane, G.P. (2011a). Development of a tourism and quality-of-life instrument quality-of-life community indicators for parks, recreation and tourism management. In M. Budruk & R. Phillips (Eds.), (Vol. 43, pp. 95-113): Springer Netherlands.

Andereck, K.L., & Nyaupane, G.P. (2011b). Exploring the nature of tourism and quality of life perceptions among residents. *Journal of Travel Research, 50*(3), 248-260.

Andereck, K.L., Valentine, K.M., Knopf, R.C., & Vogt, C.A. (2005). Residents' perceptions of community tourism impacts. *Annals of Tourism Research, 32*(4), 1056-1076.

Andereck, K.L., Valentine, K.M., Vogt, C.A., & Knopf, R.C. (2007). A cross-cultural analysis of tourism and quality of life perceptions. *Journal of Sustainable Tourism, 15*(5), 483-502.

Andereck, K.L., & Vogt, C.A. (2000). The relationship between residents' attitudes toward tourism and tourism development options. *Journal of Travel Research, 39*(1), 27.

Andriotis, K. (2002). Scale of hospitality firms and local economic development—evidence from Crete. *Tourism Management, 23*(4), 333-341.

Andriotis, K. (2005). Community groups' perceptions of and preferences for tourism development: Evidence from Crete. *Journal of Hospitality & Tourism Research, 29*(1), 67-90.

Ap, J. (1992). Residents' perceptions on tourism impacts. *Annals of Tourism Research, 19*(4), 665-690.

Ap, J., & Crompton, J.L. (1998). Developing and testing a tourism impact scale. *Journal of Travel Research, 37*(2), 120-130.

Archer, B., & Fletcher, J. (1996). The economic impact of tourism in the Seychelles. *Annals of Tourism Research, 23*(1), 32-47.

Archer, B., & Revell, J. (1977). *Tourism multipliers: The state of the art* (Vol. 11): University of Wales Press Cardiff.

Aronson, N.R., Pulver, G.C., & Buse, R.C. (1985). *Influence of community characteristics on the level of retail trade.* University of Wisconsin--Madison.

Baade, R.A., & Matheson, V.A. (2007). Professional sports, hurricane katrina, and the economic redevelopment of New Orleans. *Contemporary Economic Policy, 25*(4), 591-603.

Bagozzi, R.P. (1975). Marketing as exchange. *The Journal of Marketing*, 32-39.

Becker, G.S., Philipson, T.J., & Soares, R.R. (2003). The quantity and quality of life and the evolution of world inequality: National Bureau of Economic Research.

Belisle, F.J., & Hoy, D.R. (1980). The perceived impact of tourism by residents a case study in Santa Marta, Colombia. *Annals of Tourism Research, 7*(1), 83-101.

Benckendorff, P., Edwards, D., Jurowski, C., Liburd, J.J., Miller, G., & Moscardo, G. (2009). Exploring the future of tourism and quality of life. *Tourism & Hospitality Research, 9*(2), 171-183.

Bender, M.Y., Deng, J., Selin, S., Arbogast, D., & Hobbs, R.A. (2008). Local residents' attitudes toward potential tourism development: The case of ansted, west Virginia. *Proceedings of the 2008 Northeastern Recreation Research Symposium*.

Berenger, V., & Verdier-Chouchane, A. (2007). Multidimensional measures of well-being: Standard of living and quality of life across countries. *World Development, 35*(7), 1259-1276.

Besculides, A., Lee, M.E., & McCormick, P.J. (2002). Residents' perceptions of the cultural benefits of tourism. *Annals of Tourism Research, 29*(2), 303-319.

Bieger, T., Beritelli, P., & Laesser, C. (2009). Size matters!-increasing DMO effectiveness and extending tourist destination boundaries. *Zeitschrift Tourism, 3*, 57.

Bramwell, B., & Lane, B. (1993). Sustainable tourism: An evolving global approach. *Journal of Sustainable Tourism, 1*(1), 1-5.

Briedenhann, J. (2011). The potential of small tourism operators in the promotion of pro-poor tourism. *Journal of Hospitality Marketing & Management, 20*(3/4), 484-500.

Briedenhann, J., & Wickens, E. (2004). Tourism routes as a tool for the economic development of rural areas—vibrant hope or impossible dream? *Tourism Management, 25*(1), 71-79.

Brülde, B. (2007). Happiness and the good life. Introduction and conceptual framework. *Journal of Happiness Studies, 8*(1), 1-14.

Buunk, B.P., & Hoorens, V. (2011). Social support and stress: The role of social comparison and social exchange processes. *British Journal of Clinical Psychology, 31*(4), 445-457.

Byrd, E.T., Bosley, H.E., & Dronberger, M.G. (2009). Comparisons of stakeholder perceptions of tourism impacts in rural eastern north Carolina. *Tourism Management, 30*(5), 693-703.

Cecil, A.K., Fu, Y.-Y., Wang, S., & Avgoustis, S.H. (2008). Exploring resident awareness of cultural tourism and its impact on quality of life. *European Journal of Tourism Research, 1*(1), 39-52.

Chancellor, C., Yu, C.-P.S., & Cole, S.T. (2011). Exploring quality of life perceptions in rural midwestern (USA) communities: An application of the core–periphery concept in a tourism development context. *International Journal of Tourism Research*.

Choi, H.C., & Murray, I. (2010). Resident attitudes toward sustainable community tourism. *Journal of Sustainable Tourism, 18*(4), 575-594.

Choi, H.C., & Sirakaya, E. (2005). Measuring residents' attitude toward sustainable tourism: Development of sustainable tourism attitude scale. *Journal of Travel Research, 43*(4), 380-394.

Choi, H.C., & Sirakaya, E. (2006). Sustainability indicators for managing community tourism. *Tourism Management, 27*(6), 1274-1289.

Chok, S., Macbeth, J., & Warren, C. (2007). Tourism as a tool for poverty alleviation: A critical analysis of 'pro-poor tourism'and implications for sustainability. *Current Issues in Tourism, 10*(2-3), 144-165.

Chuang, S.T. (2010). Rural tourism: Perspectives from social exchange theory. *Social Behavior and Personality: an international journal, 38*(10), 1313-1322.

Cini, F., Kruger, S., & Ellis, S. (2013). A model of intrinsic and extrinsic motivations on subjective well-being: The experience of overnight visitors to a national park. *Applied Research in Quality of Life, 8*(1), 45-61.

Cobb, C.W., & Rixford, C. (1998). *Lessons learned from the history of social indicators* (Vol. 1): Redefining Progress San Francisco, CA.

Cochrane, S.H., OHara, D.J., & Leslie, J. (1980). The effects of education on health.

Cohen, S. (2004). Social relationships and health. *American psychologist, 59*(8), 676.

Coleman, J.S., & Coleman, J.S. (1994). *Foundations of social theory*: Belknap Press of Harvard University Press.

Coltman, T., Devinney, T.M., Midgley, D.F., & Venaik, S. (2008). Formative versus reflective measurement models: Two applications of formative measurement. *Journal of Business Research, 61*(12), 1250-1262.

Cook, C.C., Crull, S.R., Bruin, M.J., Yust, B.L., Shelley, M.C., Laux, S., . . . White, B.J. (2009). Evidence of a housing decision chain in rural community vitality. *Rural Sociology, 74*(1), 113-137.

Cui, X., & Ryan, C. (2011). Perceptions of place, modernity and the impacts of tourism – differences among rural and urban residents of ankang, China: A likelihood ratio analysis. *Tourism Management, 32*(3), 604-615.

Cummins, R.A. (1996). The domains of life satisfaction: An attempt to order chaos. *Social Indicators Research, 38*(3), 303-328.

Cummins, R.A. (2005). The domains of life satisfaction: An attempt to order chaos citation classics from social indicators research. In A. C. Michalos (Ed.), (Vol. 26, pp. 559-584): Springer Netherlands.

D'Hauteserre, A.-M. (2001). Representations of rurality: Is foxwoods casino resort threatening the quality of life in southeastern connecticut? *Tourism Geographies, 3*(4), 405-429.

Dann, G.M.S. (2001). Senior tourism and quality of life. *Journal of Hospitality & Leisure Marketing, 9*(1/2), 5.

de Bloom, J., Geurts, S.E., & Kompier, M.J. (2013). Vacation (after-) effects on employee health and well-being, and the role of vacation activities, experiences and sleep. *Journal of Happiness Studies, 14*(2), 613-633.

Deery, M., Jago, L., & Fredline, L. (2012). Rethinking social impacts of tourism research: A new research agenda. *Tourism Management, 33*(1), 64-73.

Deller, S.C., Tsai, T.-H., Marcouiller, D.W., & English, D.B.K. (2001). The role of amenities and quality of life in rural economic growth. *American Journal of Agricultural Economics, 83*(2), 352-365.

Diamantopoulos, A., & Siguaw, J.A. (2006). Formative versus reflective indicators in organizational measure development: A comparison and empirical illustration. *British Journal of Management, 17*(4), 263-282.

Diener, E. (1995). A value based index for measuring national quality of life. *Social Indicators Research, 36*(2), 107-127.

Diener, E., & Biswas-Diener, R. (2002). Will money increase subjective well-being? *Social Indicators Research, 57*(2), 119-169.

Diener, E., & Diener, C. (1995). The wealth of nations revisited: Income and quality of life. *Social Indicators Research, 36*(3), 275-286.

Diener, E., Lucas, R., Schimmack, U., & Helliwell, J. (2009). *Well-being for public policy*: Oxford University Press.

Diener, E., & Suh, E. (1997). Measuring quality of life: Economic, social, and subjective indicators. *Social Indicators Research, 40*(1), 189-216.

Dolnicar, S., Lazarevski, K., & Yanamandram, V. (2013). Quality of life and tourism: A conceptual framework and novel segmentation base. *Journal of Business Research, 66*(6), 724-729.

Dolnicar, S., Yanamandram, V., & Cliff, K. (2012). The contribution of vacations to quality of life. *Annals of Tourism Research, 39*(1), 59-83.

Duffield, B.S. (1982). Tourism: The measurement of economic and social impact. *Tourism Management, 3*(4), 248-255.

Dunteman, G.H. (1989). *Principal components analysis*: Sage.

Dwyer, L., Forsyth, P., & Spurr, R. (2004). Evaluating tourism's economic effects: New and old approaches. *Tourism management, 25*(3), 307-317.

Dwyer, L., & Kim, C. (2003). Destination competitiveness: Determinants and indicators. *Current Issues in Tourism, 6*(5), 369-414.

Eadington, W.R., & Redman, M. (1991). Economics and tourism. *Annals of Tourism Research, 18*(1), 41-56.

Faulkner, B., & Tideswell, C. (1997). A framework for monitoring community impacts of tourism. *Journal of Sustainable Tourism, 5*(1), 3-28.

Felce, D., & Perry, J. (1995). Quality of life: Its definition and measurement. *Research in developmental disabilities, 16*(1), 51-74.

Filep, S. (2014). Moving beyond subjective well-being: A tourism critique. *Journal of Hospitality & Tourism Research, 38*(2), 266-274.

Filimonau, V., Dickinson, J., & Robbins, D. (2014). The carbon impact of short-haul tourism: A case study of UK travel to southern France using life cycle analysis. *Journal of Cleaner Production, 64*(0), 628-638.

Flanagan, J.C. (1978). A research approach to improving our quality of life. *American Psychologist; American Psychologist, 33*(2), 138.

Fletcher, J.E. (1989). Input-output analysis and tourism impact studies. *Annals of Tourism Research, 16*(4), 514-529.

Frauman, E., & Banks, S. (2011). Gateway community resident perceptions of tourism development: Incorporating importance-performance analysis into a limits of acceptable change framework. *Tourism Management, 32*(1), 128-140.

Gannon, A. (1994). Rural tourism as a factor in rural community economic development for economies in transition. *Journal of Sustainable Tourism, 2*(1-2), 51-60.

Gans, J., King, S., Stonecash, R., & Mankiw, N.G. (2011). *Principles of economics*: Cengage Learning.

Gladstone, W., Curley, B., & Shokri, M.R. (2013). Environmental impacts of tourism in the Gulf and the Red Sea. *Marine Pollution Bulletin, 72*(2), 375-388.

Glatzer, W. (2006). Quality of life in the European Union and the United States of America: Evidence from comprehensive indices. *Applied research in quality of life, 1*(2), 169-188.

Golant, S.M. (2010). Individual differences underlying the dwelling satisfaction of the elderly. *Journal of Social Issues, 38*(3), 121-133.

Gu, H., & Ryan, C. (2008). Place attachment, identity and community impacts of tourism—the case of a beijing hutong. *Tourism Management, 29*(4), 637-647.

Gursoy, D., Chi, C.G., & Dyer, P. (2009). An examination of locals' attitudes. *Annals of Tourism Research, 36*(4), 723-726.

Haley, A.J., Snaith, T., & Miller, G. (2005). The social impacts of tourism a case study of Bath, UK. *Annals of Tourism Research, 32*(3), 647-668.

Han, G., Fang, W.-T., & Huang, Y.-W. (2011). Classification and influential factors in the perceived tourism impacts of community residents on nature-based destinations: China's tiantangzhai scenic area. *Procedia Environmental Sciences, 10, Part C*(0), 2010-2015.

Harrill, R. (2004). Residents' attitudes toward tourism development: A literature review with implications for tourism planning. *Journal of Planning Literature, 18*(3), 251-266.

Helliwell, J.F., & Putnam, R.D. (2004). The social context of well-being. *Philosophical transactions-royal society of London series B biological sciences*, 1435-1446.

Henderson, R. (2012). Industry employment and output projections to 2020. *Monthly Labor Review, 135*(1).

Higgins-Desbiolles, F. (2006). More than an "industry": The forgotten power of tourism as a social force. *Tourism Management, 27*(6), 1192-1208.

Horn, C., & Simmons, D. (2002). Community adaptation to tourism: Comparisons between Rotorua and Kaikoura, New Zealand. *Tourism Management, 23*(2), 133-143.

Horst, T. (2009). Tourism and economic development in mountain regions: An economic assessment. *Annals of Faculty of Economics, 4*(1), 858-860.

Hsieh, H.-J., & Kung, S.-F. (2013). The linkage analysis of environmental impact of tourism industry. *Procedia Environmental Sciences, 17*(0), 658-665.

Jackson, M.S., & Inbakaran, R.J. (2006). Evaluating residents' attitudes and intentions to act towards tourism development in regional Victoria, Australia. *International Journal of Tourism Research, 8*(5), 355-366.

Johnston, R.J., & Tyrrell, T.J. (2005). A dynamic model of sustainable tourism. *Journal of Travel Research, 44*(2), 124-134.

Jurowski, C., & Gursoy, D. (2004). Distance effects on residents' attitudes toward tourism. *Annals of Tourism Research, 31*(2), 296-312.

Kaiser, H.F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement, 20*, 141-151.

Khizindar, T.M. (2012). Effects of tourism on residents' quality of life in Saudi Arabia: An empirical study. *Journal of Hospitality Marketing & Management, 21*(6), 617-637.

Kieffer, J.M., Verrips, E., & Hoogstraten, J. (2009). Model specification in oral health‐related quality of life research. *European journal of oral sciences, 117*(5), 481-484.

Kim, K., Uysal, M., & Sirgy, M.J. (2013). How does tourism in a community impact the quality of life of community residents? *Tourism Management, 36*(0), 527-540.

King, B., Pizam, A., & Milman, A. (1993). Social impacts of tourism: Host perceptions. *Annals of Tourism Research, 20*(4), 650-665.

Ko, D.-W., & Stewart, W.P. (2002). A structural equation model of residents' attitudes for tourism development. *Tourism Management, 23*(5), 521-530.

Langford, C.P.H., Bowsher, J., Maloney, J.P., & Lillis, P.P. (2008). Social support: A conceptual analysis. *Journal of Advanced Nursing, 25*(1), 95-100.

Lankford, S.V., & Howard, D.R. (1994). Developing a tourism impact attitude scale. *Annals of Tourism Research, 21*(1), 121-139.

Látková, P., & Vogt, C.A. (2012). Residents' attitudes toward existing and future tourism development in rural communities. *Journal of Travel Research, 51*(1), 50-67.

Lee, J.W., & Brahmasrene, T. (2013). Investigating the influence of tourism on economic growth and carbon emissions: Evidence from panel analysis of the European Union. *Tourism Management, 38*(0), 69-76.

Lee, T.H. (2013). Influence analysis of community resident support for sustainable tourism development. *Tourism Management, 34*(0), 37-46.

Liu, J.C., Sheldon, P.J., & Var, T. (1987). Resident perception of the environmental impacts of tourism. *Annals of Tourism Research, 14*(1), 17-37.

Liu, J.C., & Var, T. (1986). Resident attitudes toward tourism impacts in Hawaii. *Annals of Tourism Research, 13*(2), 193-214.

Liu, Z. (2003). Sustainable tourism development: A critique. *Journal of sustainable tourism, 11*(6), 459-475.

Lordkipanidze, M., Brezet, H., & Backman, M. (2005). The entrepreneurship factor in sustainable tourism development. *Journal of Cleaner Production, 13*(8), 787-798.

Maggino, F., & Zumbo, B.D. (2012). Measuring the quality of life and the construction of social indicators *Handbook of social indicators and quality of life research* (pp. 201-238): Springer.

Malecki, E. (2004). Jockeying for position: What it means and why it matters to regional development policy when places compete. *Regional Studies, 38*(9), 1101-1120.

Mannell, R.C. (2007). Leisure, health and weil-being. *World Leisure Journal, 49*(3), 114-128.

Matarrita-Cascante, D. (2010). Changing communities, community satisfaction, and quality of life: A view of multiple perceived indicators. *Social Indicators Research, 98*(1), 105-127.

McCabe, S., & Johnson, S. (2013). The happiness factor in tourism: Subjective well-being and social tourism. *Annals of Tourism Research, 41*(0), 42-65.

Meara, E.R., Richards, S., & Cutler, D.M. (2008). The gap gets bigger: Changes in mortality and life expectancy, by education, 1981–2000. *Health Affairs, 27*(2), 350-360.

Meng, F., Li, X., & Uysal, M. (2010). Tourism development and regional quality of life: The case of China. *Journal of China Tourism Research, 6*(2), 164-182.

Michalos, A.C. (2004). Social indicators research and health-related quality of life research. *Social indicators research, 65*(1), 27-72.

Miller, G. (2001). The development of indicators for sustainable tourism: Results of a Delphi survey of tourism researchers. *Tourism Management, 22*(4), 351-362.

Milman, A., & Pizam, A. (1988). Social impacts of tourism on central Florida. *Annals of Tourism Research, 15*(2), 191-204.

Milne, S., & Ateljevic, I. (2001). Tourism, economic development and the global-local nexus: Theory embracing complexity. *Tourism geographies, 3*(4), 369-393.

Moscardo, G. (2009). Tourism and quality of life: Towards a more critical approach. *Tourism & Hospitality Research, 9*(2), 159-170.

Nawijn, J., & Mitas, O. (2012). Resident attitudes to tourism and their effect on subjective well-being: The case of Palma de Mallorca. *Journal of Travel Research, 51*(5), 531-541.

Neal, J.D., Sirgy, M.J., & Uysal, M. (2004). Measuring the effect of tourism services on travelers' quality of life: Further validation. *Social Indicators Research, 69*(3), 243-277.

Neal, J.D., Uysal, M., & Sirgy, M.J. (2007). The effect of tourism services on travelers' quality of life. *Journal of Travel Research, 46*(2), 154-163.

New Economics Foundation. (2006). The Happy Planet Index. from http://www.happyplanetindex.org/

Ng, Y.-K. (2008). Environmentally responsible happy nation index: Towards an internationally acceptable national success indicator. *Social Indicators Research, 85*(3), 425-446.

Nunkoo, R., & Gursoy, D. (2012). Residents' support for tourism: An identity perspective. *Annals of Tourism Research, 39*(1), 243-268.

Nunkoo, R., & Ramkissoon, H. (2011). Residents' satisfaction with community attributes and support for tourism. *Journal of Hospitality & Tourism Research, 35*(2), 171.

O'brien, R.M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & Quantity, 41*(5), 673-690.

OECD. (2011). OECD Better Life Index. from http://www.oecdbetterlifeindex.org/

OECD. (2014). *How's life in your region? Measuring regional and local well-being for policy making: Measuring regional and local well-being for policy making*: OECD Publishing.

Park, D.-B., Lee, K.-W., Choi, H.-S., & Yoon, Y. (2012). Factors influencing social capital in rural tourism communities in South Korea. *Tourism Management, 33*(6), 1511-1520.

Pearcy, D.H., & Anderson, A. (2010). Exploring the jamaican health tourism sector within a sustainability framework. *Journal of Tourism Challenges and Trends*(3.2), 51-80.

Perdue, R.R., Long, P.T., & Allen, L. (1990). Resident support for tourism development. *Annals of Tourism Research, 17*(4), 586-599.

Perdue, R.R., Long, P.T., & Kang, Y.S. (1999). Boomtown tourism and resident quality of life: The marketing of gaming to host community residents. *Journal of Business Research, 44*(3), 165-177.

Petersen, M.A. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies, 22*(1), 435-480.

Potter, J., Cantarero, R., & Wood, H. (2012). The multi-dimensional nature of predicting quality of life. *Procedia-Social and Behavioral Sciences, 50*, 781-790.

Pouwels, B., Siegers, J., & Vlasblom, J.D. (2008). Income, working hours, and happiness. *Economics Letters, 99*(1), 72-74.

Puczkó, L., & Smith, M. (2010). Tourism-specific quality-of-life index: The Budapest model. *Quality-of-Life Community Indicators for Parks, Recreation and Tourism Management, Social Indicators Research Series, 43*, 163-184.

Pulina, M., Meleddu, M., & Del Chiappa, G. (2013). Residents' choice probability and tourism development. *Tourism Management Perspectives, 5*(0), 57-67.

Qian, X.L., & Yarnal, C. (2011). The role of playfulness in the leisure stress-coping process among emerging adults: An SEM analysis. *Leisure/Loisir: Journal of the Canadian Association for Leisure Studies, 35*(2), 191-209.

Raphael, D., Renwick, R., Brown, I., Steinmetz, B., Sehdev, H., & Phillips, S. (2001). Making the links between community structure and individual well-being: Community quality of life in riverdale, toronto, canada. *Health & Place, 7*(3), 179-196.

Rappaport, J., & Sachs, J.D. (2003). The united states as a coastal nation. *Journal of Economic growth, 8*(1), 5-46.

Reblin, M., & Uchino, B.N. (2008). Social and emotional support and its implication for health. *Current Opinion in Psychiatry, 21*(2), 201.

Ross, C.E., & Willigen, M.V. (1997). Education and the subjective quality of life. *Journal of Health and Social Behavior, 38*(3), 275-297.

Saenz-de-Miera, O., & Rosselló, J. (2014). Modeling tourism impacts on air pollution: The case study of pm10 in mallorca. *Tourism Management, 40*(0), 273-281.

Scott, K. (2009). Community vitality: Measuring what matters. *Transition*, 1.

Sharpley, R. (2014). Host perceptions of tourism: A review of the research. *Tourism Management, 42*(0), 37-49.

Sherrieb, K., Norris, F.H., & Galea, S. (2010). Measuring capacities for community resilience. *Social Indicators Research, 99*(2), 227-247.

Simpson, M.C. (2008). Community benefit tourism initiatives—a conceptual oxymoron? *Tourism Management, 29*(1), 1-18.

Sinclair, M.T. (1998). Tourism and economic development: A survey. *Journal of Development Studies, 34*(5), 1-51.

Sirgy, M.J. (1998). Materialism and quality of life. *Social indicators research, 43*(3), 227-260.

Sirgy, M.J. (2011). Societal qol is more than the sum of qol of individuals: The whole is greater than the sum of the parts. *Applied Research in Quality of Life, 6*(3), 329-334.

Sirgy, M.J., Lee, D.J., Miller, C., & Littlefield, J.E. (2004). The impact of globalization on a country's quality of life: Toward an integrated model. *Social Indicators Research, 68*(3), 251-298.

Sirgy, M.J., Rahtz, D.R., Cicic, M., & Underwood, R. (2000). A method for assessing residents' satisfaction with community-based services: A quality-of-life perspective. *Social Indicators Research, 49*(3), 279-316.

Smith, M.D., & Krannich, R.S. (1998). Tourism dependence and resident attitudes. *Annals of Tourism Research, 25*(4), 783-802.

Solnet, D.J., Ford, R.C., Robinson, R.N.S., Ritchie, B.W., & Olsen, M. (2014). Modeling locational factors for tourism employment. *Annals of Tourism Research, 45*(0), 30-45.

Song, H., Dwyer, L., Li, G., & Cao, Z. (2012). Tourism economics research: A review and assessment. *Annals of Tourism Research, 39*(3), 1653-1682.

Stiglitz, J.E., Sen, A., & Fitoussi, J.-P. (2010). Report by the commission on the measurement of economic performance and social progress.

Strine, T., Chapman, D., Balluz, L., & Mokdad, A. (2008). Health-related quality of life and health behaviors by social and emotional support. *Social Psychiatry and Psychiatric Epidemiology, 43*(2), 151-159.

Teye, V., Sirakaya, E., & F Sönmez, S. (2002). Residents' attitudes toward tourism development. *Annals of Tourism Research, 29*(3), 668-688.

Tosun, C. (2002). Host perceptions of impacts: A comparative tourism study. *Annals of Tourism Research, 29*(1), 231-253.

U.S. Environmental Protection Agency. (2001). *Frequently asked questions about atmospheric deposition: A handbook for watershed managers*: DIANE Publishing.

U.S. Environmental Protection Agency. (2009). *Air quality index: A guide to air quality and your health*. Research Triangle Park, NC.

Uchino, B.N., Cacioppo, J.T., & Kiecolt-Glaser, J.K. (1996). The relationship between social support and physiological processes: A review with emphasis on underlying mechanisms and implications for health. *Psychological bulletin, 119*(3), 488.

Vanegas, M. (2010). Box-cox estimation of international tourism demand for Nicaragua. *Tourism Analysis, 15*(4), 447-459.

Vargas-Sánchez, A., Plaza-Mejía, M.Á., & Porras-Bueno, N. (2009). Understanding residents' attitudes toward the development of industrial tourism in a former mining community. *Journal of Travel Research, 47*(3), 373.

Wang, Y.A., & Pfister, R.E. (2008). Residents' attitudes toward tourism and perceived personal benefits in a rural community. *Journal of Travel Research, 47*(1), 84-93.

Warnick, R. (2002). Rural recreation lifestyles: Trends in recreation activity patterns and self-reported quality of life and health - an exploratory study. *Journal of Park & Recreation Administration, 20*(4), 37-64.

Webster, C., & Ivanov, S. (2014). Transforming competitiveness into economic benefits: Does tourism stimulate economic growth in more competitive destinations? *Tourism Management, 40*(0), 137-140.

Weesie, J. (1999). Seemingly unrelated estimation and the cluster-adjusted sandwich estimator. *Stata Technical Bulletin, 52*, 34-47.

Wooldridge, J. (2012). *Introductory econometrics: A modern approach*: Cengage Learning.

Yamada, N., Heo, J., King, C., & Fu, Y.-Y. (2011). Urban residents' life satisfaction and cultural tourism development: The role of health perception, wealth, safety, community contentment, and cultural turism development. *Journal of Quality Assurance in Hospitality & Tourism, 12*(3), 220-235.

Zamani-Farahani, H., & Musa, G. (2012). The relationship between Islamic religiosity and residents' perceptions of socio-cultural impacts of tourism in Iran: Case studies of Sare'in and Masooleh. *Tourism Management, 33*(4), 802-814.

Zhan, L. (1992). Quality of life: Conceptual and measurement issues. *Journal of Advanced Nursing, 17*(7), 795-800.

Zhao, W., & Ritchie, J.B. (2007). Tourism and poverty alleviation: An integrative research framework. *Current Issues in Tourism, 10*(2-3), 119-143.

Zumbo, B.D. (2007). Validity: Foundational issues and statistical methodology. *Handbook of statistics: Psychometrics, 26*, 45-79.

APPENDICES

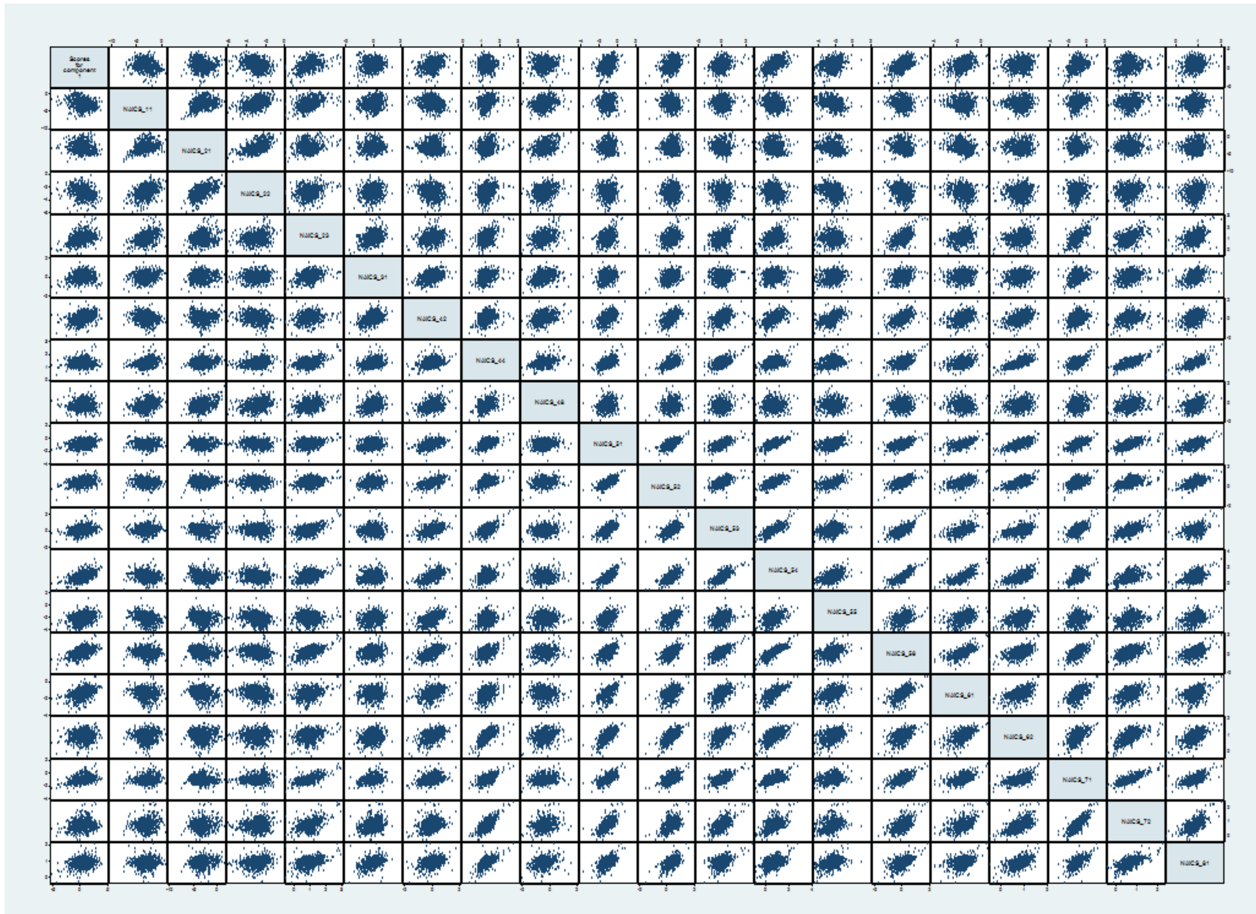

Figure A-1: Scatter Plot of Material QOL Index VS. Key Independent Variables

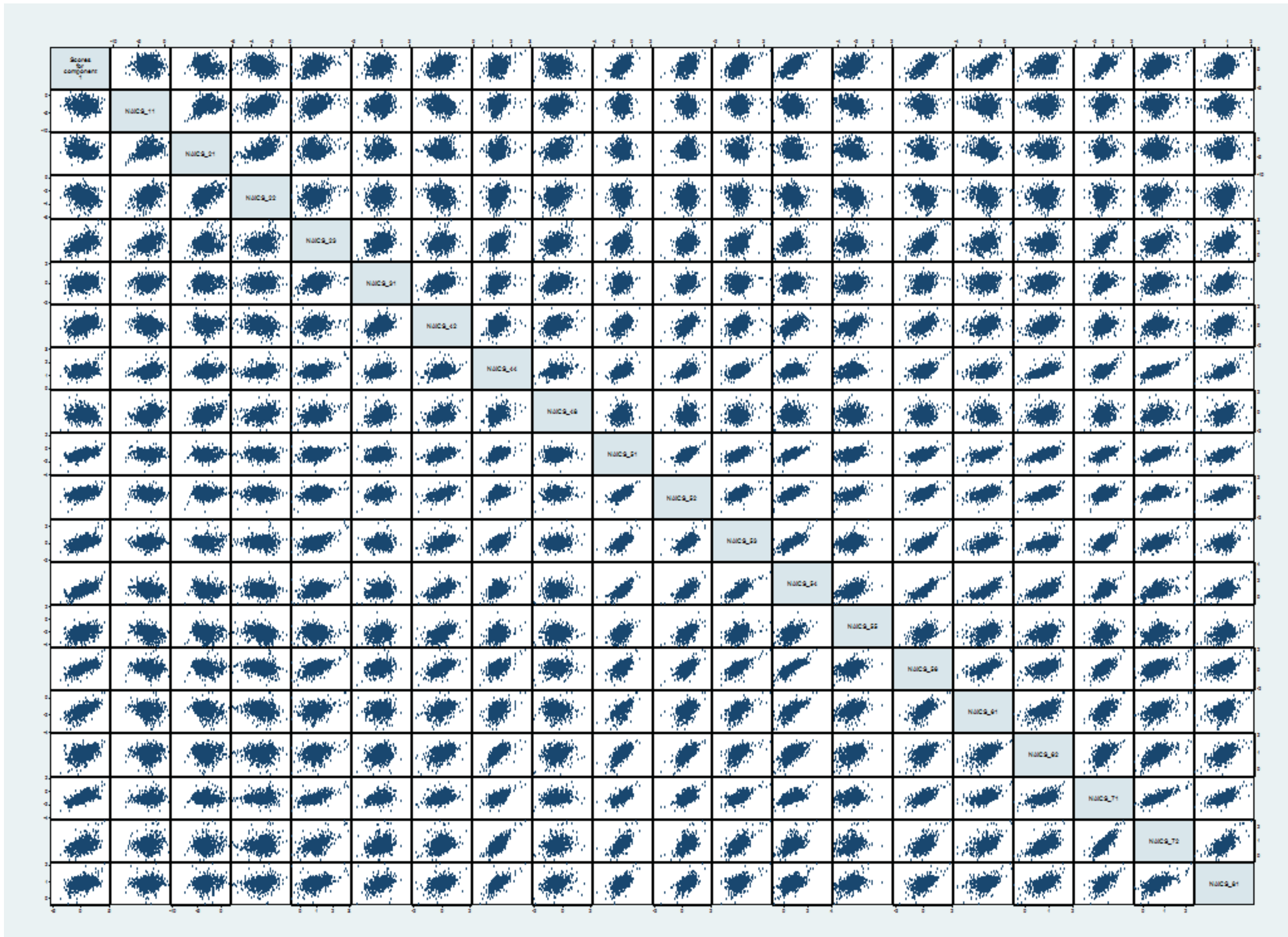

Figure A-2: Scatter Plot of Social QOL1 Index VS. Key Independent Variables

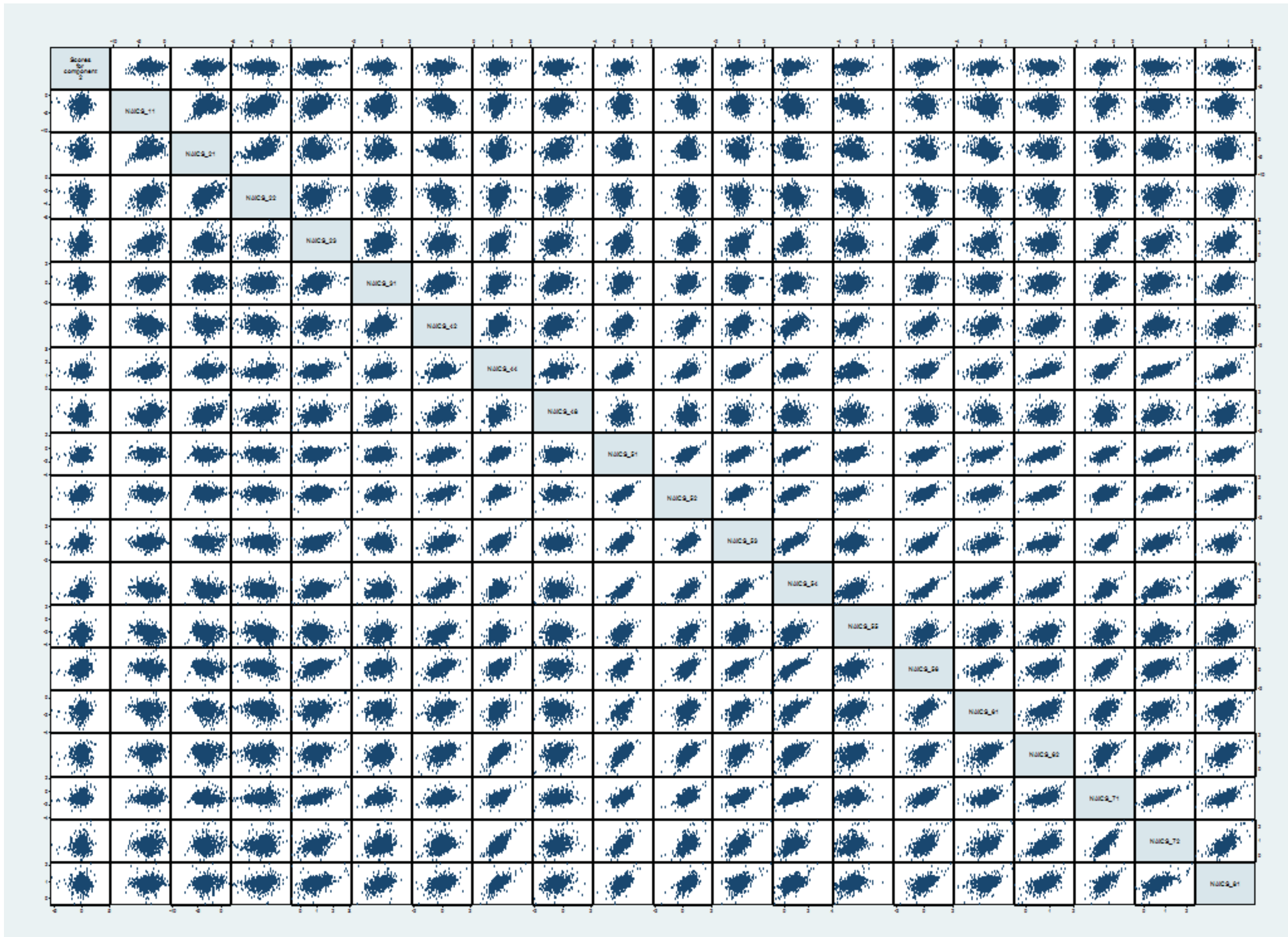

Figure A-3: Scatter Plot of Social QOL2 Index VS. Key Independent Variables

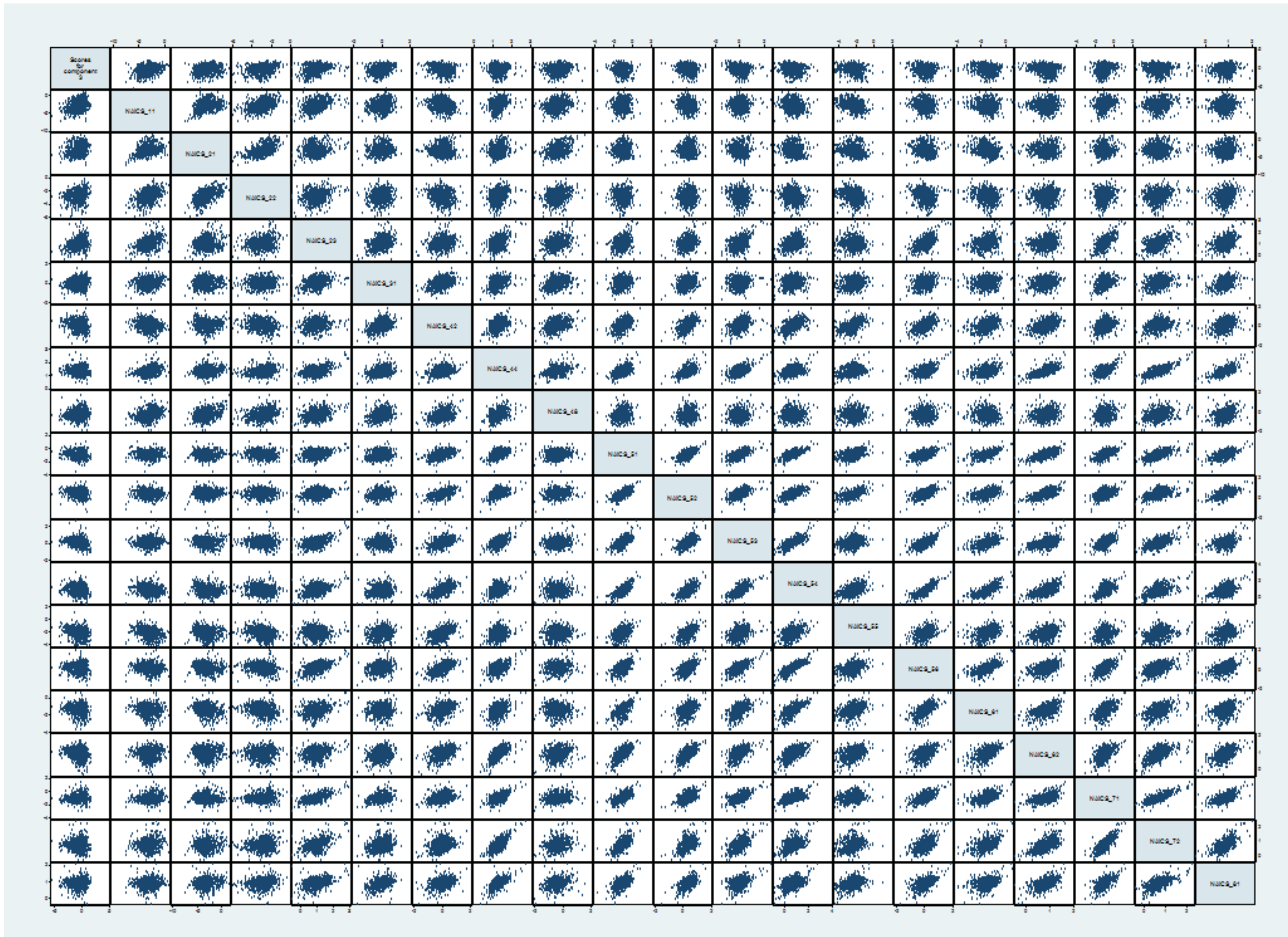

Figure A-4: Scatter Plot of Social QOL3 Index VS. Key Independent Variables

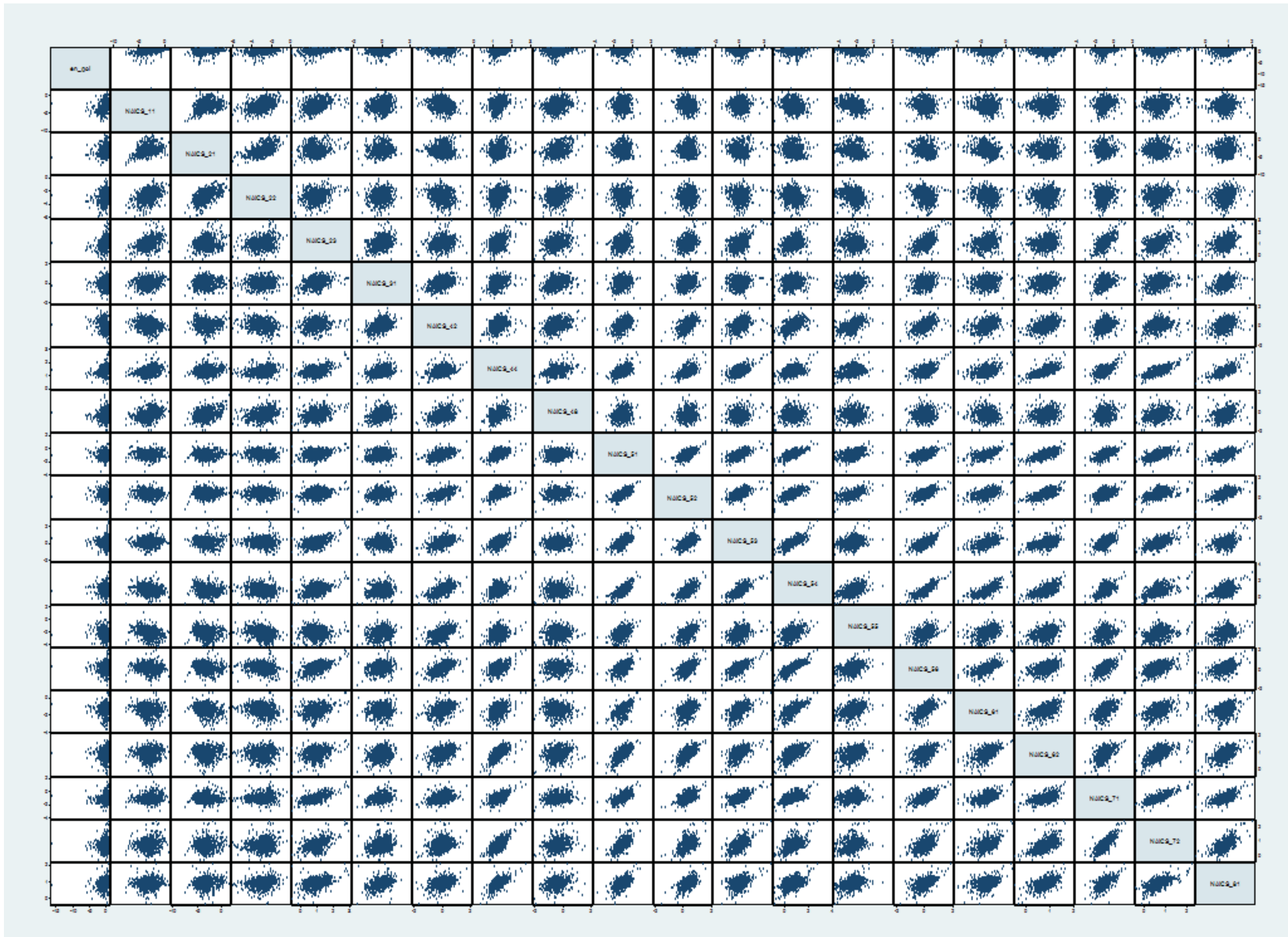

Figure A-5: Scatter Plot of Environmental QOL Index VS. Key Independent Variables

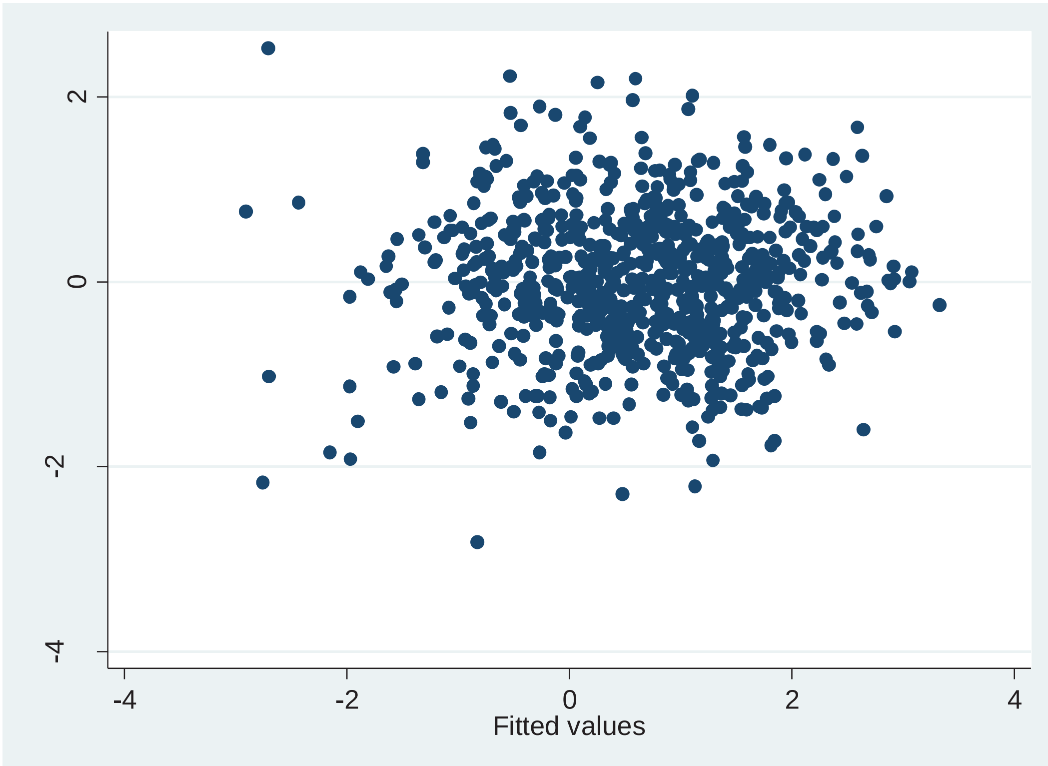

Figure A-6: Scatter Plot of Fitted values VS. Residuals - Material QOL Model

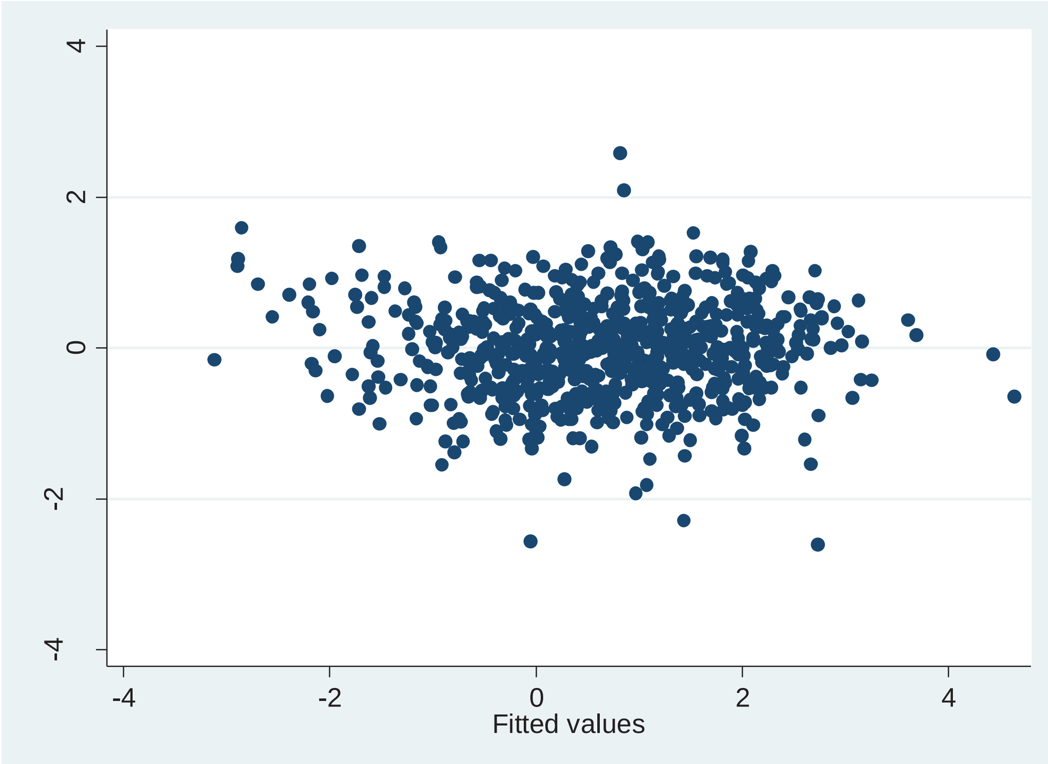

Figure A-7: Scatter Plot of Fitted values VS. Residuals - Social QOL1 Model

Figure A-8: Scatter Plot of Fitted values VS. Residuals - Social QOL2 Model

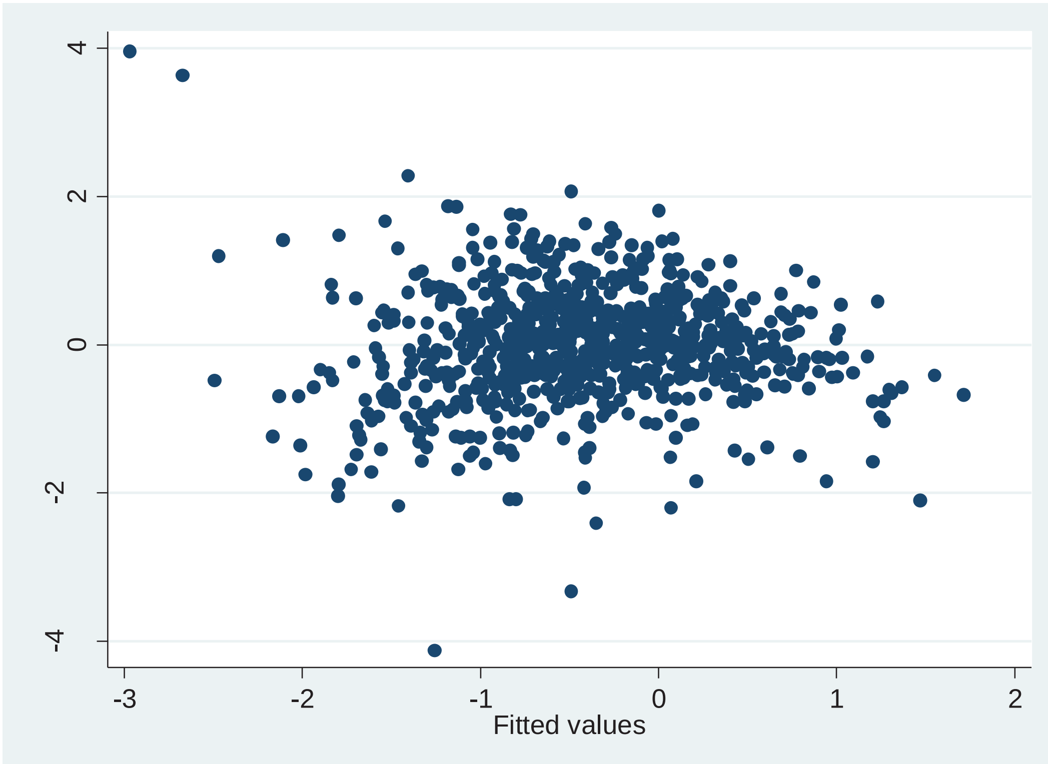

Figure A-9: Scatter Plot of Fitted values VS. Residuals - Social QOL3 Model

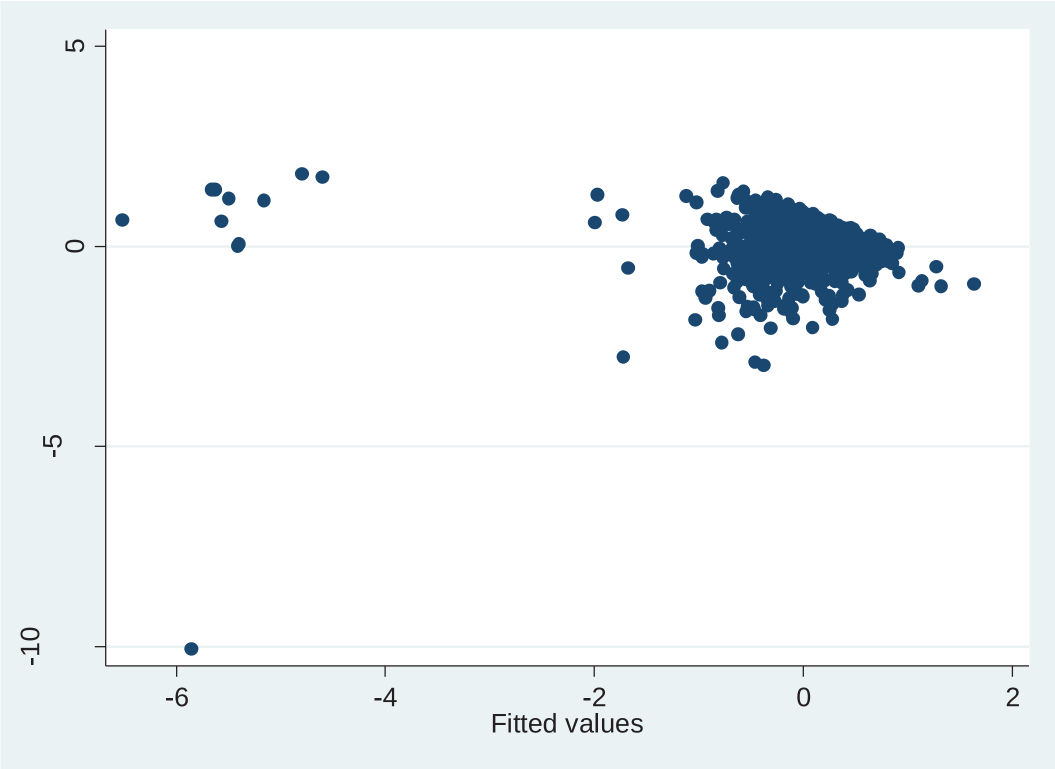

Figure A-10: Scatter Plot of Fitted values VS. Residuals - Environmental QOL Model with a Dummy Variable for Outliers

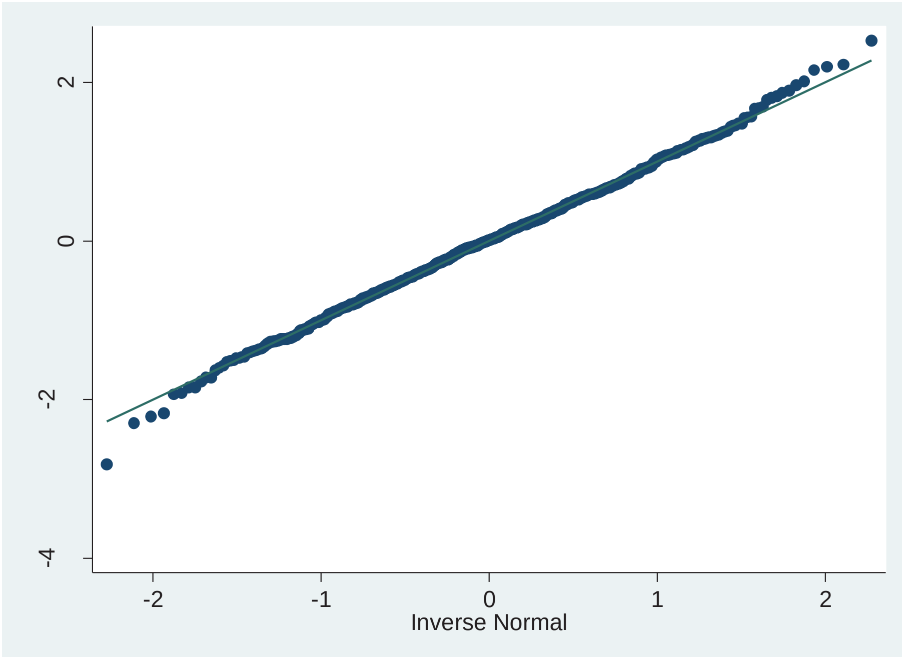

Figure A-11: Normal Quantile Plot– Material QOL Model

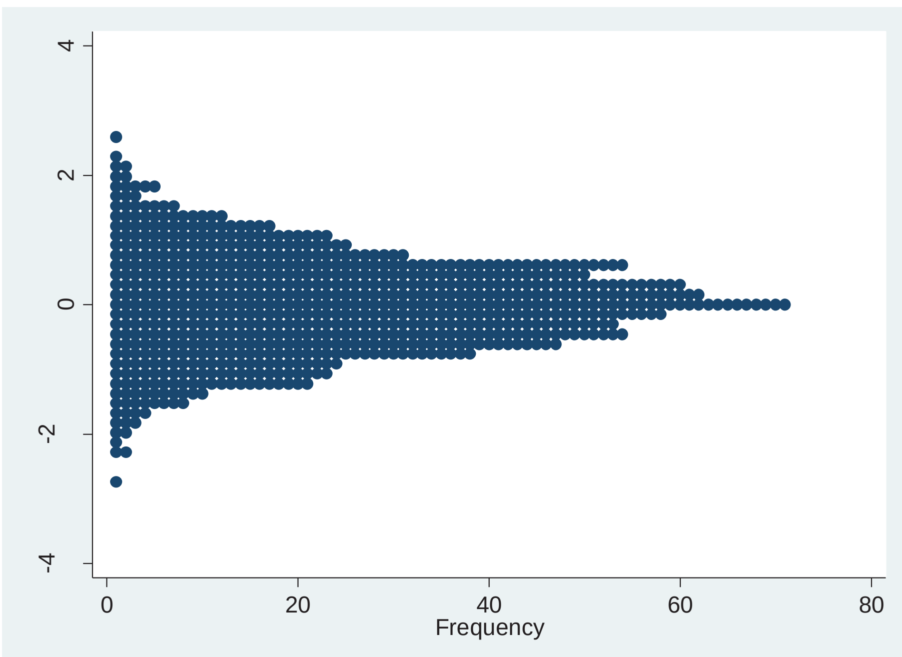

Figure A-12: Distributional Dot Plot - Material QOL Model

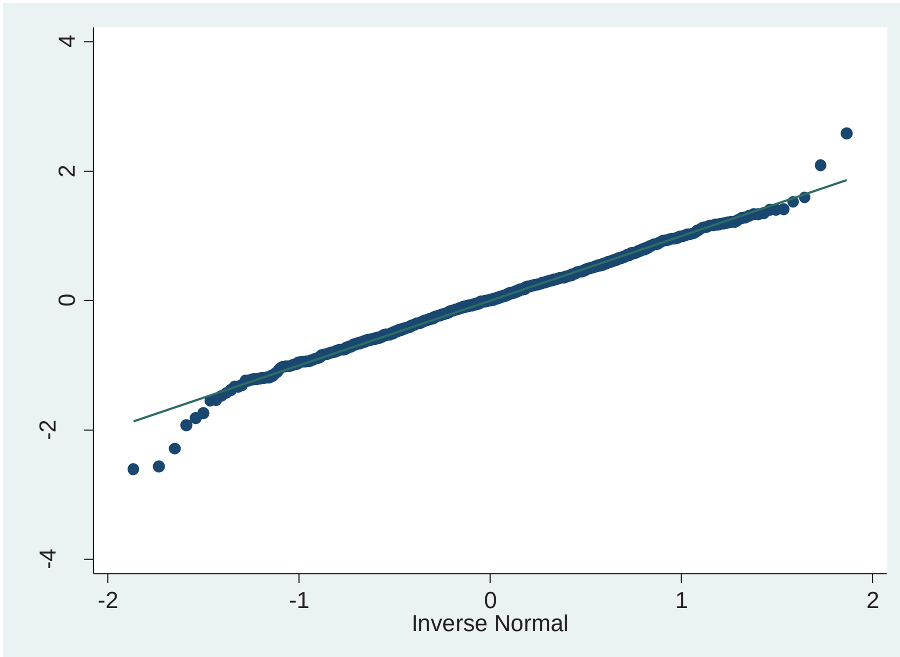

Figure A-13: Normal Quantile Plot– Social QOL1 Model

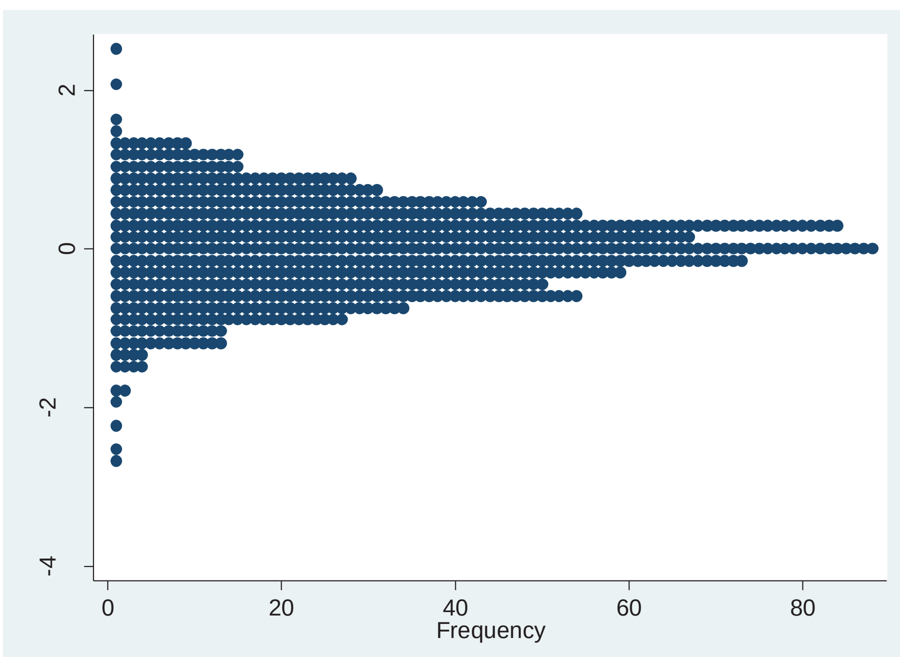

Figure A-14: Distributional Dot Plot - Social QOL1 Model

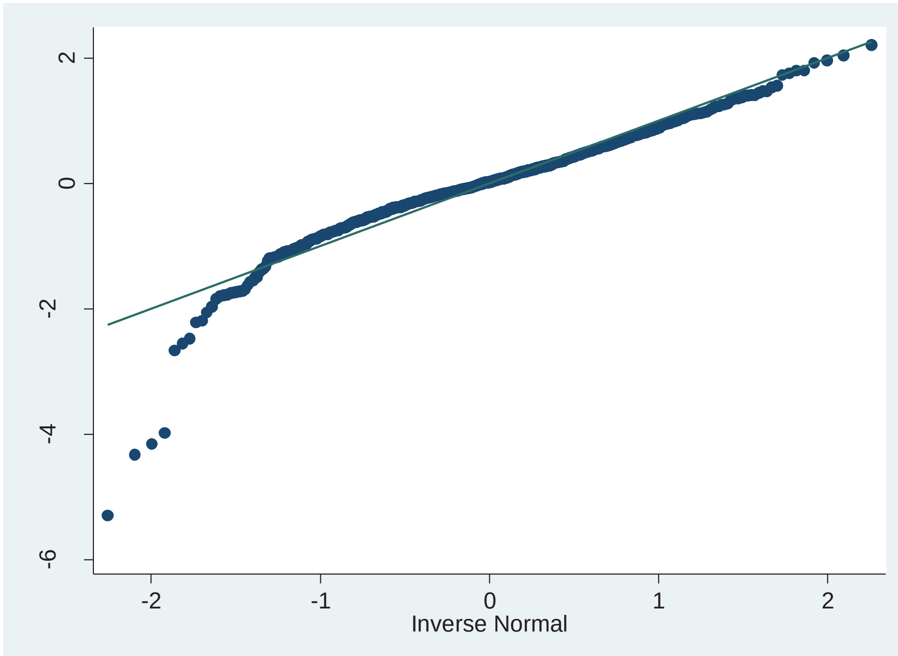

Figure A-15: Normal Quantile Plot– Social QOL2 Model

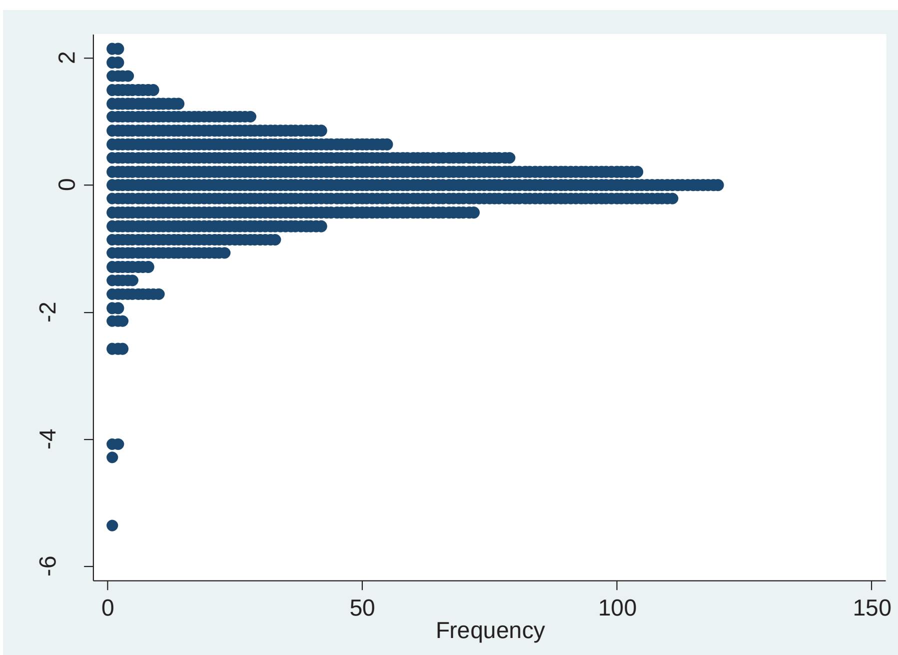

Figure A-16: Distributional Dot Plot - Social QOL2 Model

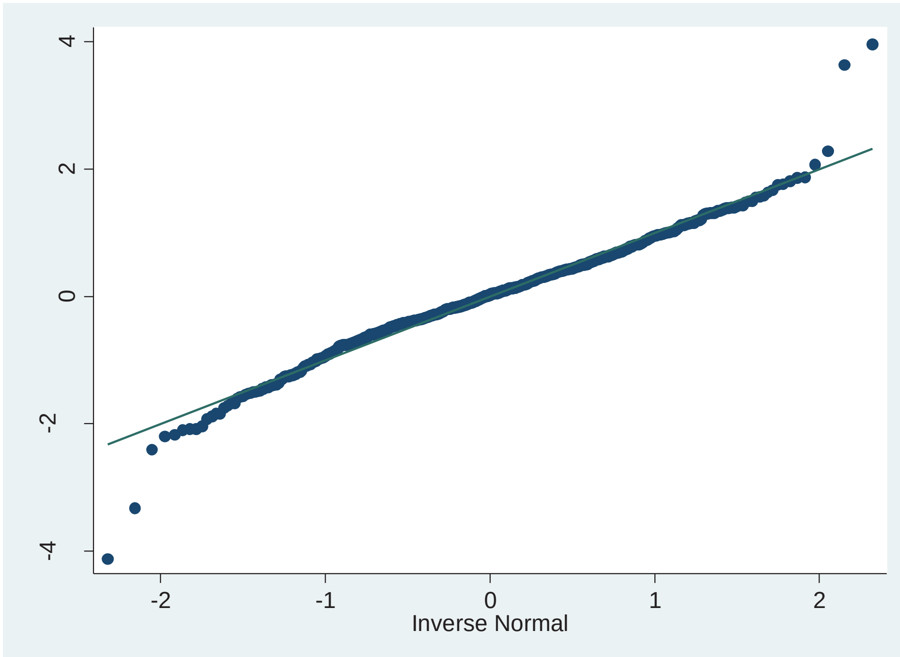

Figure A-17: Normal Quantile Plot– Social QOL3 Model

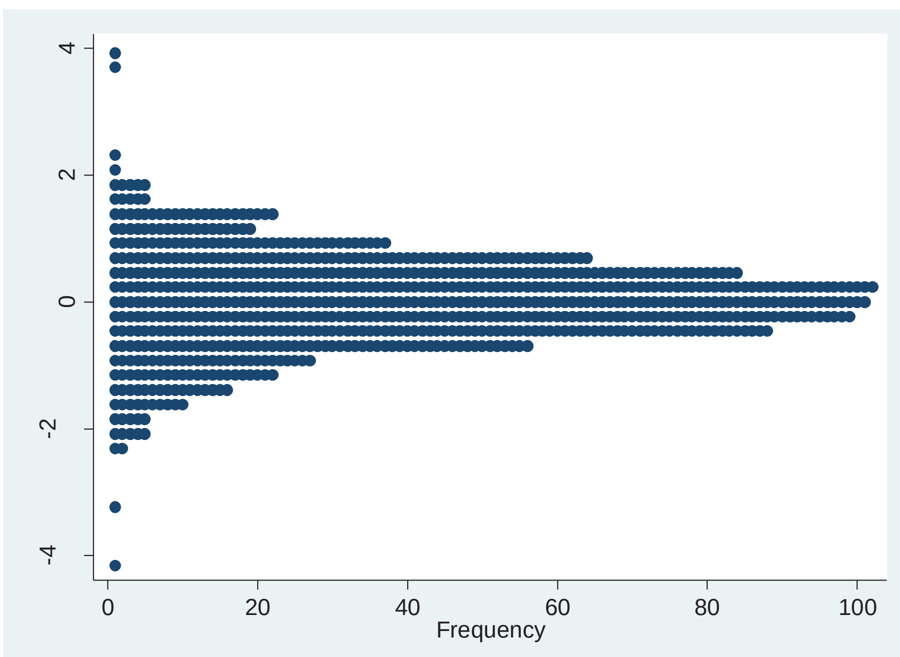

Figure A-18: Distributional Dot Plot - Social QOL3 Model

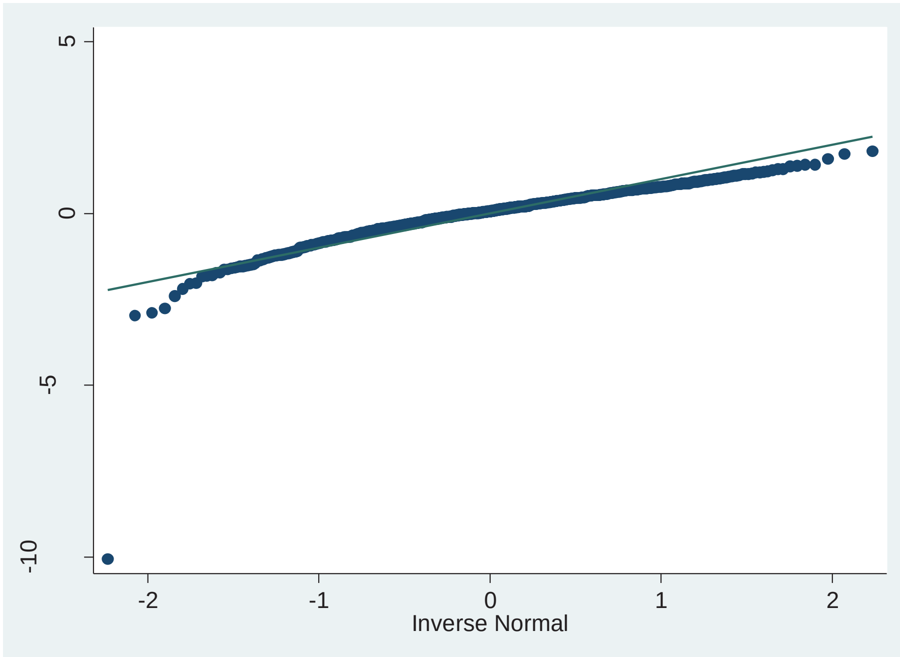

Figure A-19: Normal Quantile Plot– Environmental QOL Model

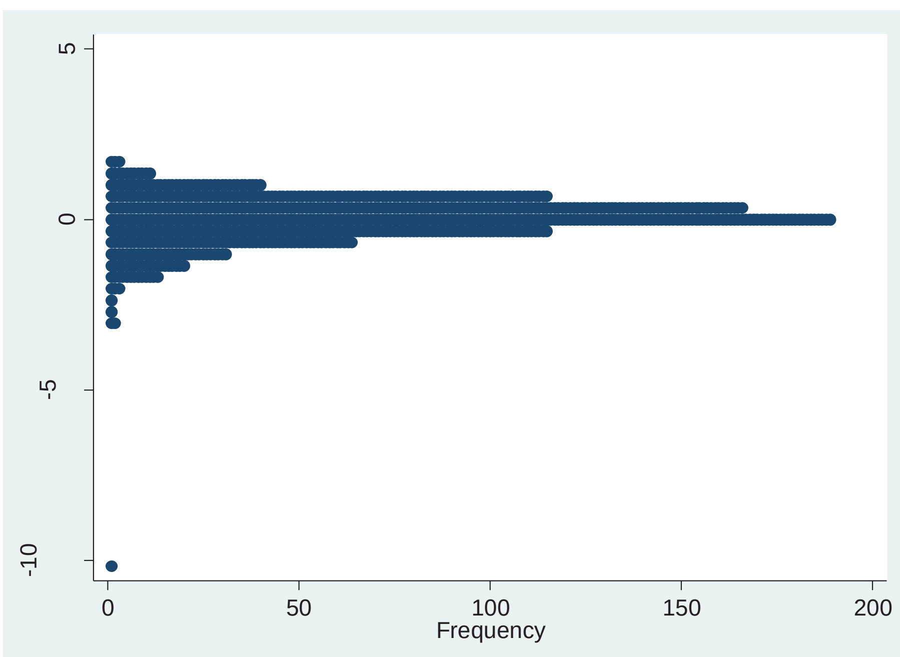

Figure A-20: Distributional Dot Plot - Environmental QOL Model

Appendix B. Stata scripts

```
******************
* to load data sets
******************

clear
use "C:\Dropbox\00 Research\00 Dissertation\06 Data\Temp data\temp_allind08.dta"

*to generate wellbing change variable
merge 1:1 fips using "C:\Dropbox\00 Research\00 Dissertation\06 Data\Temp data\temp_IPE.dta",
nogenerate
merge 1:1 fips using "C:\Dropbox\00 Research\00 Dissertation\06 Data\Temp data\temp_social_qol.dta",
nogenerate
merge 1:1 fips using "C:\Dropbox\00 Research\00 Dissertation\06 Data\Temp data\temp_health.dta",
nogenerate
merge 1:1 fips using "C:\Dropbox\00 Research\00 Dissertation\06 Data\Temp
data\temp_county_sat08.dta", nogenerate
merge 1:1 fips using "C:\Dropbox\00 Research\00 Dissertation\06 Data\Temp data\temp_ele_vote08.dta",
nogenerate
merge 1:1 fips using "C:\Dropbox\00 Research\00 Dissertation\06 Data\Temp data\temp_air08.dta",
nogenerate
merge 1:1 fips using "C:\Dropbox\00 Research\00 Dissertation\06 Data\Temp data\temp_countycode.dta",
nogenerate
gen voter=ele010208d/ popestimate2008
* to select county data
drop if rururb2003==.

* cobb-douglass transformation
gen  ln_income08 =ln(income08)
gen  ln_non_pov08 =ln(non_pov08)
gen  ln_emp_rate08 =ln(emp_rate08)
gen  ln_goodqua08 =ln(goodqua08)
gen  ln_health08 =ln(health08)
gen  ln_sat08 =ln(sat08)
gen  ln_emotion08 =ln(emotion08)
gen  ln_safety08 =ln(safety08)
gen ln_vote08=ln(voter)
gen  ln_edu08  =ln(edu08 )
gen ln_rural= ln(rururb2003)

gen  ln_est08_11k = ln(est08_11k)
gen  ln_est08_21k = ln(est08_21k)
gen  ln_est08_22k = ln(est08_22k)
gen  ln_est08_23k = ln(est08_23k)
gen  ln_est08_31k = ln(est08_31k)
gen  ln_est08_42k = ln(est08_42k)
gen  ln_est08_44k = ln(est08_44k)
gen  ln_est08_48k = ln(est08_48k)
gen  ln_est08_51k = ln(est08_51k)
gen  ln_est08_52k = ln(est08_52k)
gen  ln_est08_53k = ln(est08_53k)
gen  ln_est08_54k = ln(est08_54k)
```

```
gen  ln_est08_55k = ln(est08_55k)
gen  ln_est08_56k = ln(est08_56k)
gen  ln_est08_61k = ln(est08_61k)
gen  ln_est08_62k = ln(est08_62k)
gen  ln_est08_71k = ln(est08_71k)
gen  ln_est08_72k = ln(est08_72k)
gen  ln_est08_81k = ln(est08_81k)

*********************************************
* to simplify variables' names
*********************************************

gen NAICS_11 = ln_est08_11k
gen NAICS_21 = ln_est08_21k
gen NAICS_22 = ln_est08_22k
gen NAICS_23 = ln_est08_23k
gen NAICS_31 = ln_est08_31k
gen NAICS_42 = ln_est08_42k
gen NAICS_44 = ln_est08_44k
gen NAICS_48 = ln_est08_48k
gen NAICS_51 = ln_est08_51k
gen NAICS_52 = ln_est08_52k
gen NAICS_53 = ln_est08_53k
gen NAICS_54 = ln_est08_54k
gen NAICS_55 = ln_est08_55k
gen NAICS_56 = ln_est08_56k
gen NAICS_61 = ln_est08_61k
gen NAICS_62 = ln_est08_62k
gen NAICS_71 = ln_est08_71k
gen NAICS_72 = ln_est08_72k
gen NAICS_81 = ln_est08_81k

 *******************************************************************************
 * to conduct PCA analysis on material and social QOL indicators and build QOL indicies
*******************************************************************************
pca  ln_income08 ln_non_pov08  ln_emp_rate08, mineigen(1)
rotate
predict m_qol, score

pca ln_edu08 ln_health08 ln_vote08 ln_sat08 ln_emotion08 ln_safety08 , mineigen(1)
rotate
predict s_qol1 s_qol2 s_qol3

sum ln_goodqua08
gen en_qol= (ln_goodqua08-r(mean))/r(sd)

*********************************************
* to provide descriptive information about samples
*********************************************

sum popestimate2008  income08  unemployment_rate_2008 pov08 edu08 health08 sat08 emotion08 safety08
ele010208d goodqua08 rururb2003
```

```
**************************************
* to select samples no missing value
*********************************
drop if en_qol==.
drop if m_qol==.
drop if s_qol1==.
drop if s_qol2==.
drop if s_qol3==.
drop if est08_11==. | est08_21==.| est08_22==.| est08_23==.| est08_31==.| est08_42==.| est08_44==.|
est08_48==.| est08_51==.| est08_52==.| est08_53==.| est08_54==.| est08_55==.| est08_56==.|
est08_61==.| est08_62==.| est08_71==.| est08_72==.| est08_81==.

*********************************************
* to generate mega city variable
*********************************************
gen mega=0
replace mega=1 if popestimate2008 >5000000
replace mega=1 if state=="NY" & popestimate2008 >1000000
replace mega=0 if fips=="36103"
replace mega=0 if fips=="36059"

*********************************************
* to generate outlier variable for en_QOL
*********************************************
regress en_qol NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  mega ln_rural farm mine manf fsgov serv rec retire
predict stdresid, rstandard
gen en_out=0
replace en_out=1 if stdresid <-3


****************************************************************
* to conduct OLS for checking OLS assumptions and sample properties
****************************************************************
regress  m_qol  NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  ln_rural farm mine manf fsgov serv rec retire
rvfplot
predict e1, resid

regress  s_qol1  NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  ln_rural farm mine manf fsgov serv rec retire
rvfplot
predict e2, resid

regress  s_qol2  NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  ln_rural farm mine manf fsgov serv rec retire
rvfplot
predict e3, resid
```

```
regress  s_qol3  NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  ln_rural farm mine manf fsgov serv rec retire
rvfplot
predict e4, resid

regress  en_qol  NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  ln_rural farm mine manf fsgov serv rec retire mega  en_out
rvfplot
predict e5, resid



***************************
* to check linearity
***************************
graph matrix m_qol NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44
NAICS_48 NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62
NAICS_71 NAICS_72 NAICS_81

graph matrix s_qol1 NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44
NAICS_48 NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62
NAICS_71 NAICS_72 NAICS_81

graph matrix s_qol2 NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44
NAICS_48 NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62
NAICS_71 NAICS_72 NAICS_81

graph matrix s_qol3 NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44
NAICS_48 NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62
NAICS_71 NAICS_72 NAICS_81

graph matrix en_qol NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44
NAICS_48 NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62
NAICS_71 NAICS_72 NAICS_81



***************************
* zero mean of residual
***************************

ttest e1 == 0
ttest e2 == 0
ttest e3 == 0
ttest e4 == 0
ttest e5 == 0

*******************************
* to test multicollinearity
*******************************
estat vif
```

```
******************************
* to check normality
******************************
qnorm e1
dotplot e1
qnorm e2
dotplot e2
qnorm e3
dotplot e3
qnorm e4
dotplot e4
qnorm e5
dotplot e5



******************************
* to conduct robust regression
******************************

regress m_qol NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  ln_rural farm mine manf fsgov serv rec retire, vce(robust)

regress s_qol1 NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  ln_rural farm mine manf fsgov serv rec retire, vce(robust)

regress s_qol2 NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  ln_rural farm mine manf fsgov serv rec retire, vce(robust)

regress s_qol3 NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  ln_rural farm mine manf fsgov serv rec retire, vce(robust)

regress en_qol NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  ln_rural farm mine manf fsgov serv rec retire mega en_out, vce(robust)

*********************************
* to conduct SUR model
*********************************
sureg (m_qol = NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81 ln_rural farm mine manf fsgov serv rec retire) (s_qol1 = NAICS_11 NAICS_21
NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48 NAICS_51 NAICS_52 NAICS_53
NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71 NAICS_72 NAICS_81 ln_rural farm
mine manf fsgov serv rec retire) (s_qol2 = NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31
NAICS_42 NAICS_44 NAICS_48 NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56
NAICS_61 NAICS_62 NAICS_71 NAICS_72 NAICS_81 ln_rural farm mine manf fsgov serv rec retire)
(s_qol3 = NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81 ln_rural farm mine manf fsgov serv rec retire) (en_qol= NAICS_11 NAICS_21
```

```
NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48 NAICS_51 NAICS_52 NAICS_53
NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71 NAICS_72 NAICS_81 ln_rural farm
mine manf fsgov serv rec retire mega en_out), corr

******************************************************************
* to conduct SUE
******************************************************************
regress  m_qol  NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  ln_rural farm mine manf fsgov serv rec retire
estimates store m1

regress  s_qol1  NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  ln_rural farm mine manf fsgov serv rec retire
estimates store m2

regress  s_qol2  NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  ln_rural farm mine manf fsgov serv rec retire
estimates store m3

regress  s_qol3  NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  ln_rural farm mine manf fsgov serv rec retire
estimates store m4

regress  en_qol  NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81  ln_rural farm mine manf fsgov serv rec retire
estimates store m5

suest m1 m2 m3 m4 m5

********************************************
* to conduct SURE model with ML estimation
********************************************

sem (m_qol <- NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81 ln_rural farm mine manf fsgov serv rec retire) (s_qol1 <- NAICS_11 NAICS_21
NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48 NAICS_51 NAICS_52 NAICS_53
NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71 NAICS_72 NAICS_81 ln_rural farm
mine manf fsgov serv rec retire) (s_qol2 <- NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31
NAICS_42 NAICS_44 NAICS_48 NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56
NAICS_61 NAICS_62 NAICS_71 NAICS_72 NAICS_81 ln_rural farm mine manf fsgov serv rec retire)
(s_qol3 <- NAICS_11 NAICS_21 NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48
NAICS_51 NAICS_52 NAICS_53 NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71
NAICS_72 NAICS_81 ln_rural farm mine manf fsgov serv rec retire) (en_qol<- NAICS_11 NAICS_21
NAICS_22 NAICS_23 NAICS_31 NAICS_42 NAICS_44 NAICS_48 NAICS_51 NAICS_52 NAICS_53
NAICS_54 NAICS_55 NAICS_56 NAICS_61 NAICS_62 NAICS_71 NAICS_72 NAICS_81 ln_rural farm
mine manf fsgov serv rec retire mega en_out), vce(robust) cov(e.s_qol1*e.m_qol e.s_qol1*e.s_qol2
e.s_qol1*e.s_qol3 e.s_qol1*e.en_qol e.s_qol2*e.m_qol e.s_qol2*e.s_qol3 e.s_qol2*e.en_qol e.s_qol3*e.en_qol
e.m_qol*e.s_qol3 e.m_qol*e.en_qol) nocapslatent
```

```
estat eqgof
estat eqtest

*******************************************************************
* Part 2 - Simulation
*******************************************************************


*******************************************************************
* to categorize counties
*******************************************************************
gen u_c=1 if coastal==1 & rururb2003<4
replace u_c=0 if u_c==.
gen u_nc=1 if coastal==0 & rururb2003<4
replace u_nc=0 if u_nc==.
gen r_c=1 if coastal==1 & rururb2003>3
replace r_c=0 if r_c==.
gen r_nc=1 if coastal==0 & rururb2003>3
replace r_nc=0 if r_nc==.
gen cou_cate=.
replace cou_cate=1 if u_c==1
replace cou_cate=2 if u_nc==1
replace cou_cate=3 if r_c==1
replace cou_cate=4 if r_nc==1
label define county_cat 1 "u_c" 2 "u_nc" 3 "r_c" 4 "r_nc"
label values cou_cate county_cat
gen rural=1 if  rururb2003>3
replace rural=0 if rural==.

*******************************************************************
* to generate expected value
*******************************************************************
predict k1, xb(m_qol)
predict k2, xb(s_qol1)
predict k3, xb(s_qol2)
predict k4, xb(s_qol3)
predict k5, xb(en_qol)

gen new_naics71_10 = ln((est08_71*1.1)/popk08)
gen new_naics72_10 = ln((est08_72*1.1)/popk08)
gen new_naics71_15 = ln((est08_71*1.15)/popk08)
gen new_naics72_15 = ln((est08_72*1.15)/popk08)
gen new_naics71_20 = ln((est08_71*1.2)/popk08)
gen new_naics72_20 = ln((est08_72*1.2)/popk08)

gen k1_10= _b[ m_qol:NAICS_11]*NAICS_11 + _b[ m_qol:NAICS_21]*NAICS_21 +
_b[ m_qol:NAICS_22]*NAICS_22 + _b[ m_qol:NAICS_23]*NAICS_23 +
_b[ m_qol:NAICS_31]*NAICS_31 + _b[ m_qol:NAICS_42]*NAICS_42 +
_b[ m_qol:NAICS_44]*NAICS_44 + _b[ m_qol:NAICS_48]*NAICS_48 +
_b[ m_qol:NAICS_51]*NAICS_51 + _b[ m_qol:NAICS_52]*NAICS_52 +
_b[ m_qol:NAICS_53]*NAICS_53 + _b[ m_qol:NAICS_54]*NAICS_54 +
_b[ m_qol:NAICS_55]*NAICS_55 + _b[ m_qol:NAICS_56]*NAICS_56 +
_b[ m_qol:NAICS_61]*NAICS_61 + _b[ m_qol:NAICS_62]*NAICS_62 +
_b[ m_qol:NAICS_71]*new_naics71_10 + _b[ m_qol:NAICS_72]*NAICS_72 +
```

```
_b[ m_qol:NAICS_81]*NAICS_81 + _b[ m_qol:ln_rural]*ln_rural + _b[ m_qol:farm]*farm +
_b[ m_qol:mine]*mine + _b[ m_qol:manf]*manf + _b[ m_qol:fsgov]*fsgov + _b[ m_qol:serv]*serv +
_b[ m_qol:rec]*rec + _b[ m_qol:retire]*retire + _b[ m_qol: _cons]* _cons

gen k1_15= _b[ m_qol:NAICS_11]*NAICS_11 + _b[ m_qol:NAICS_21]*NAICS_21 +
_b[ m_qol:NAICS_22]*NAICS_22 + _b[ m_qol:NAICS_23]*NAICS_23 +
_b[ m_qol:NAICS_31]*NAICS_31 + _b[ m_qol:NAICS_42]*NAICS_42 +
_b[ m_qol:NAICS_44]*NAICS_44 + _b[ m_qol:NAICS_48]*NAICS_48 +
_b[ m_qol:NAICS_51]*NAICS_51 + _b[ m_qol:NAICS_52]*NAICS_52 +
_b[ m_qol:NAICS_53]*NAICS_53 + _b[ m_qol:NAICS_54]*NAICS_54 +
_b[ m_qol:NAICS_55]*NAICS_55 + _b[ m_qol:NAICS_56]*NAICS_56 +
_b[ m_qol:NAICS_61]*NAICS_61 + _b[ m_qol:NAICS_62]*NAICS_62 +
_b[ m_qol:NAICS_71]*new_naics71_15 + _b[ m_qol:NAICS_72]*NAICS_72 +
_b[ m_qol:NAICS_81]*NAICS_81 + _b[ m_qol:ln_rural]*ln_rural + _b[ m_qol:farm]*farm +
_b[ m_qol:mine]*mine + _b[ m_qol:manf]*manf + _b[ m_qol:fsgov]*fsgov + _b[ m_qol:serv]*serv +
_b[ m_qol:rec]*rec + _b[ m_qol:retire]*retire + _b[ m_qol: _cons]* _cons

gen k1_20= _b[ m_qol:NAICS_11]*NAICS_11 + _b[ m_qol:NAICS_21]*NAICS_21 +
_b[ m_qol:NAICS_22]*NAICS_22 + _b[ m_qol:NAICS_23]*NAICS_23 +
_b[ m_qol:NAICS_31]*NAICS_31 + _b[ m_qol:NAICS_42]*NAICS_42 +
_b[ m_qol:NAICS_44]*NAICS_44 + _b[ m_qol:NAICS_48]*NAICS_48 +
_b[ m_qol:NAICS_51]*NAICS_51 + _b[ m_qol:NAICS_52]*NAICS_52 +
_b[ m_qol:NAICS_53]*NAICS_53 + _b[ m_qol:NAICS_54]*NAICS_54 +
_b[ m_qol:NAICS_55]*NAICS_55 + _b[ m_qol:NAICS_56]*NAICS_56 +
_b[ m_qol:NAICS_61]*NAICS_61 + _b[ m_qol:NAICS_62]*NAICS_62 +
_b[ m_qol:NAICS_71]*new_naics71_20 + _b[ m_qol:NAICS_72]*NAICS_72 +
_b[ m_qol:NAICS_81]*NAICS_81 + _b[ m_qol:ln_rural]*ln_rural + _b[ m_qol:farm]*farm +
_b[ m_qol:mine]*mine + _b[ m_qol:manf]*manf + _b[ m_qol:fsgov]*fsgov + _b[ m_qol:serv]*serv +
_b[ m_qol:rec]*rec + _b[ m_qol:retire]*retire + _b[ m_qol: _cons]* _cons

gen k2_10= _b[ s_qol1:NAICS_11]*NAICS_11 + _b[ s_qol1:NAICS_21]*NAICS_21 +
_b[ s_qol1:NAICS_22]*NAICS_22 + _b[ s_qol1:NAICS_23]*NAICS_23 +
_b[ s_qol1:NAICS_31]*NAICS_31 + _b[ s_qol1:NAICS_42]*NAICS_42 +
_b[ s_qol1:NAICS_44]*NAICS_44 + _b[ s_qol1:NAICS_48]*NAICS_48 +
_b[ s_qol1:NAICS_51]*NAICS_51 + _b[ s_qol1:NAICS_52]*NAICS_52 +
_b[ s_qol1:NAICS_53]*NAICS_53 + _b[ s_qol1:NAICS_54]*NAICS_54 +
_b[ s_qol1:NAICS_55]*NAICS_55 + _b[ s_qol1:NAICS_56]*NAICS_56 +
_b[ s_qol1:NAICS_61]*NAICS_61 + _b[ s_qol1:NAICS_62]*NAICS_62 +
_b[ s_qol1:NAICS_71]*new_naics71_10 + _b[ s_qol1:NAICS_72]*new_naics72_10 +
_b[ s_qol1:NAICS_81]*NAICS_81 + _b[ s_qol1:ln_rural]*ln_rural + _b[ s_qol1:farm]*farm +
_b[ s_qol1:mine]*mine + _b[ s_qol1:manf]*manf + _b[ s_qol1:fsgov]*fsgov + _b[ s_qol1:serv]*serv +
_b[ s_qol1:rec]*rec + _b[ s_qol1:retire]*retire + _b[ s_qol1: _cons]* _cons

gen k2_15= _b[ s_qol1:NAICS_11]*NAICS_11 + _b[ s_qol1:NAICS_21]*NAICS_21 +
_b[ s_qol1:NAICS_22]*NAICS_22 + _b[ s_qol1:NAICS_23]*NAICS_23 +
_b[ s_qol1:NAICS_31]*NAICS_31 + _b[ s_qol1:NAICS_42]*NAICS_42 +
_b[ s_qol1:NAICS_44]*NAICS_44 + _b[ s_qol1:NAICS_48]*NAICS_48 +
_b[ s_qol1:NAICS_51]*NAICS_51 + _b[ s_qol1:NAICS_52]*NAICS_52 +
_b[ s_qol1:NAICS_53]*NAICS_53 + _b[ s_qol1:NAICS_54]*NAICS_54 +
_b[ s_qol1:NAICS_55]*NAICS_55 + _b[ s_qol1:NAICS_56]*NAICS_56 +
_b[ s_qol1:NAICS_61]*NAICS_61 + _b[ s_qol1:NAICS_62]*NAICS_62 +
_b[ s_qol1:NAICS_71]*new_naics71_15 + _b[ s_qol1:NAICS_72]*new_naics72_15 +
_b[ s_qol1:NAICS_81]*NAICS_81 + _b[ s_qol1:ln_rural]*ln_rural + _b[ s_qol1:farm]*farm +
```

_b[s_qol1:mine]*mine + _b[s_qol1:manf]*manf + _b[s_qol1:fsgov]*fsgov + _b[s_qol1:serv]*serv + _b[s_qol1:rec]*rec + _b[s_qol1:retire]*retire + _b[s_qol1: _cons]* _cons

gen k2_20= _b[s_qol1:NAICS_11]*NAICS_11 + _b[s_qol1:NAICS_21]*NAICS_21 + _b[s_qol1:NAICS_22]*NAICS_22 + _b[s_qol1:NAICS_23]*NAICS_23 + _b[s_qol1:NAICS_31]*NAICS_31 + _b[s_qol1:NAICS_42]*NAICS_42 + _b[s_qol1:NAICS_44]*NAICS_44 + _b[s_qol1:NAICS_48]*NAICS_48 + _b[s_qol1:NAICS_51]*NAICS_51 + _b[s_qol1:NAICS_52]*NAICS_52 + _b[s_qol1:NAICS_53]*NAICS_53 + _b[s_qol1:NAICS_54]*NAICS_54 + _b[s_qol1:NAICS_55]*NAICS_55 + _b[s_qol1:NAICS_56]*NAICS_56 + _b[s_qol1:NAICS_61]*NAICS_61 + _b[s_qol1:NAICS_62]*NAICS_62 + _b[s_qol1:NAICS_71]*new_naics71_20 + _b[s_qol1:NAICS_72]*new_naics72_20 + _b[s_qol1:NAICS_81]*NAICS_81 + _b[s_qol1:ln_rural]*ln_rural + _b[s_qol1:farm]*farm + _b[s_qol1:mine]*mine + _b[s_qol1:manf]*manf + _b[s_qol1:fsgov]*fsgov + _b[s_qol1:serv]*serv + _b[s_qol1:rec]*rec + _b[s_qol1:retire]*retire + _b[s_qol1: _cons]* _cons

gen k3_10= _b[s_qol2:NAICS_11]*NAICS_11 + _b[s_qol2:NAICS_21]*NAICS_21 + _b[s_qol2:NAICS_22]*NAICS_22 + _b[s_qol2:NAICS_23]*NAICS_23 + _b[s_qol2:NAICS_31]*NAICS_31 + _b[s_qol2:NAICS_42]*NAICS_42 + _b[s_qol2:NAICS_44]*NAICS_44 + _b[s_qol2:NAICS_48]*NAICS_48 + _b[s_qol2:NAICS_51]*NAICS_51 + _b[s_qol2:NAICS_52]*NAICS_52 + _b[s_qol2:NAICS_53]*NAICS_53 + _b[s_qol2:NAICS_54]*NAICS_54 + _b[s_qol2:NAICS_55]*NAICS_55 + _b[s_qol2:NAICS_56]*NAICS_56 + _b[s_qol2:NAICS_61]*NAICS_61 + _b[s_qol2:NAICS_62]*NAICS_62 + _b[s_qol2:NAICS_71]*NAICS_71 + _b[s_qol2:NAICS_72]*NAICS_72+ _b[s_qol2:NAICS_81]*NAICS_81 + _b[s_qol2:ln_rural]*ln_rural + _b[s_qol2:farm]*farm + _b[s_qol2:mine]*mine + _b[s_qol2:manf]*manf + _b[s_qol2:fsgov]*fsgov + _b[s_qol2:serv]*serv + _b[s_qol2:rec]*rec + _b[s_qol2:retire]*retire + _b[s_qol2: _cons]* _cons

gen k3_15= _b[s_qol2:NAICS_11]*NAICS_11 + _b[s_qol2:NAICS_21]*NAICS_21 + _b[s_qol2:NAICS_22]*NAICS_22 + _b[s_qol2:NAICS_23]*NAICS_23 + _b[s_qol2:NAICS_31]*NAICS_31 + _b[s_qol2:NAICS_42]*NAICS_42 + _b[s_qol2:NAICS_44]*NAICS_44 + _b[s_qol2:NAICS_48]*NAICS_48 + _b[s_qol2:NAICS_51]*NAICS_51 + _b[s_qol2:NAICS_52]*NAICS_52 + _b[s_qol2:NAICS_53]*NAICS_53 + _b[s_qol2:NAICS_54]*NAICS_54 + _b[s_qol2:NAICS_55]*NAICS_55 + _b[s_qol2:NAICS_56]*NAICS_56 + _b[s_qol2:NAICS_61]*NAICS_61 + _b[s_qol2:NAICS_62]*NAICS_62 + _b[s_qol2:NAICS_71]*NAICS_71 + _b[s_qol2:NAICS_72]*NAICS_72+ _b[s_qol2:NAICS_81]*NAICS_81 + _b[s_qol2:ln_rural]*ln_rural + _b[s_qol2:farm]*farm + _b[s_qol2:mine]*mine + _b[s_qol2:manf]*manf + _b[s_qol2:fsgov]*fsgov + _b[s_qol2:serv]*serv + _b[s_qol2:rec]*rec + _b[s_qol2:retire]*retire + _b[s_qol2: _cons]* _cons

gen k3_20= _b[s_qol2:NAICS_11]*NAICS_11 + _b[s_qol2:NAICS_21]*NAICS_21 + _b[s_qol2:NAICS_22]*NAICS_22 + _b[s_qol2:NAICS_23]*NAICS_23 + _b[s_qol2:NAICS_31]*NAICS_31 + _b[s_qol2:NAICS_42]*NAICS_42 + _b[s_qol2:NAICS_44]*NAICS_44 + _b[s_qol2:NAICS_48]*NAICS_48 + _b[s_qol2:NAICS_51]*NAICS_51 + _b[s_qol2:NAICS_52]*NAICS_52 + _b[s_qol2:NAICS_53]*NAICS_53 + _b[s_qol2:NAICS_54]*NAICS_54 + _b[s_qol2:NAICS_55]*NAICS_55 + _b[s_qol2:NAICS_56]*NAICS_56 + _b[s_qol2:NAICS_61]*NAICS_61 + _b[s_qol2:NAICS_62]*NAICS_62 + _b[s_qol2:NAICS_71]*NAICS_71+ _b[s_qol2:NAICS_72]*NAICS_72+ _b[s_qol2:NAICS_81]*NAICS_81 + _b[s_qol2:ln_rural]*ln_rural + _b[s_qol2:farm]*farm + _b[s_qol2:mine]*mine + _b[s_qol2:manf]*manf + _b[s_qol2:fsgov]*fsgov + _b[s_qol2:serv]*serv + _b[s_qol2:rec]*rec + _b[s_qol2:retire]*retire + _b[s_qol2: _cons]* _cons

```
gen k4_10= _b[ s_qol3:NAICS_11]*NAICS_11 + _b[ s_qol3:NAICS_21]*NAICS_21 +
_b[ s_qol3:NAICS_22]*NAICS_22 + _b[ s_qol3:NAICS_23]*NAICS_23 +
_b[ s_qol3:NAICS_31]*NAICS_31 + _b[ s_qol3:NAICS_42]*NAICS_42 +
_b[ s_qol3:NAICS_44]*NAICS_44 + _b[ s_qol3:NAICS_48]*NAICS_48 +
_b[ s_qol3:NAICS_51]*NAICS_51 + _b[ s_qol3:NAICS_52]*NAICS_52 +
_b[ s_qol3:NAICS_53]*NAICS_53 + _b[ s_qol3:NAICS_54]*NAICS_54 +
_b[ s_qol3:NAICS_55]*NAICS_55 + _b[ s_qol3:NAICS_56]*NAICS_56 +
_b[ s_qol3:NAICS_61]*NAICS_61 + _b[ s_qol3:NAICS_62]*NAICS_62 +
_b[ s_qol3:NAICS_71]*new_naics71_10 + _b[ s_qol3:NAICS_72]*new_naics72_10 +
_b[ s_qol3:NAICS_81]*NAICS_81 + _b[ s_qol3:ln_rural]*ln_rural + _b[ s_qol3:farm]*farm +
_b[ s_qol3:mine]*mine + _b[ s_qol3:manf]*manf + _b[ s_qol3:fsgov]*fsgov + _b[ s_qol3:serv]*serv +
_b[ s_qol3:rec]*rec + _b[ s_qol3:retire]*retire + _b[ s_qol3: _cons]* _cons

gen k4_15= _b[ s_qol3:NAICS_11]*NAICS_11 + _b[ s_qol3:NAICS_21]*NAICS_21 +
_b[ s_qol3:NAICS_22]*NAICS_22 + _b[ s_qol3:NAICS_23]*NAICS_23 +
_b[ s_qol3:NAICS_31]*NAICS_31 + _b[ s_qol3:NAICS_42]*NAICS_42 +
_b[ s_qol3:NAICS_44]*NAICS_44 + _b[ s_qol3:NAICS_48]*NAICS_48 +
_b[ s_qol3:NAICS_51]*NAICS_51 + _b[ s_qol3:NAICS_52]*NAICS_52 +
_b[ s_qol3:NAICS_53]*NAICS_53 + _b[ s_qol3:NAICS_54]*NAICS_54 +
_b[ s_qol3:NAICS_55]*NAICS_55 + _b[ s_qol3:NAICS_56]*NAICS_56 +
_b[ s_qol3:NAICS_61]*NAICS_61 + _b[ s_qol3:NAICS_62]*NAICS_62 +
_b[ s_qol3:NAICS_71]*new_naics71_15  + _b[ s_qol3:NAICS_72]*new_naics72_15 +
_b[ s_qol3:NAICS_81]*NAICS_81 + _b[ s_qol3:ln_rural]*ln_rural + _b[ s_qol3:farm]*farm +
_b[ s_qol3:mine]*mine + _b[ s_qol3:manf]*manf + _b[ s_qol3:fsgov]*fsgov + _b[ s_qol3:serv]*serv +
_b[ s_qol3:rec]*rec + _b[ s_qol3:retire]*retire + _b[ s_qol3: _cons]* _cons

gen k4_20= _b[ s_qol3:NAICS_11]*NAICS_11 + _b[ s_qol3:NAICS_21]*NAICS_21 +
_b[ s_qol3:NAICS_22]*NAICS_22 + _b[ s_qol3:NAICS_23]*NAICS_23 +
_b[ s_qol3:NAICS_31]*NAICS_31 + _b[ s_qol3:NAICS_42]*NAICS_42 +
_b[ s_qol3:NAICS_44]*NAICS_44 + _b[ s_qol3:NAICS_48]*NAICS_48 +
_b[ s_qol3:NAICS_51]*NAICS_51 + _b[ s_qol3:NAICS_52]*NAICS_52 +
_b[ s_qol3:NAICS_53]*NAICS_53 + _b[ s_qol3:NAICS_54]*NAICS_54 +
_b[ s_qol3:NAICS_55]*NAICS_55 + _b[ s_qol3:NAICS_56]*NAICS_56 +
_b[ s_qol3:NAICS_61]*NAICS_61 + _b[ s_qol3:NAICS_62]*NAICS_62 +
_b[ s_qol3:NAICS_71]*new_naics71_20  + _b[ s_qol3:NAICS_72]*new_naics72_20 +
_b[ s_qol3:NAICS_81]*NAICS_81 + _b[ s_qol3:ln_rural]*ln_rural + _b[ s_qol3:farm]*farm +
_b[ s_qol3:mine]*mine + _b[ s_qol3:manf]*manf + _b[ s_qol3:fsgov]*fsgov + _b[ s_qol3:serv]*serv +
_b[ s_qol3:rec]*rec + _b[ s_qol3:retire]*retire + _b[ s_qol3: _cons]* _cons

gen k5_10= _b[ en_qol:NAICS_11]*NAICS_11 + _b[ en_qol:NAICS_21]*NAICS_21 +
_b[ en_qol:NAICS_22]*NAICS_22 + _b[ en_qol:NAICS_23]*NAICS_23 +
_b[ en_qol:NAICS_31]*NAICS_31 + _b[ en_qol:NAICS_42]*NAICS_42 +
_b[ en_qol:NAICS_44]*NAICS_44 + _b[ en_qol:NAICS_48]*NAICS_48 +
_b[ en_qol:NAICS_51]*NAICS_51 + _b[ en_qol:NAICS_52]*NAICS_52 +
_b[ en_qol:NAICS_53]*NAICS_53 + _b[ en_qol:NAICS_54]*NAICS_54 +
_b[ en_qol:NAICS_55]*NAICS_55 + _b[ en_qol:NAICS_56]*NAICS_56 +
_b[ en_qol:NAICS_61]*NAICS_61 + _b[ en_qol:NAICS_62]*NAICS_62 +
_b[ en_qol:NAICS_71]*new_naics71_10 + _b[ en_qol:NAICS_72]*NAICS_72 +
_b[ en_qol:NAICS_81]*NAICS_81 + _b[ en_qol:ln_rural]*ln_rural + _b[ en_qol:farm]*farm +
_b[ en_qol:mine]*mine + _b[ en_qol:manf]*manf + _b[ en_qol:fsgov]*fsgov + _b[ en_qol:serv]*serv +
_b[ en_qol:rec]*rec + _b[ en_qol:retire]*retire + _b[ en_qol: mega]* mega + _b[ en_qol: en_out]* en_out +
_b[ en_qol: _cons]* _cons
```

```
gen k5_15= _b[ en_qol:NAICS_11]*NAICS_11 + _b[ en_qol:NAICS_21]*NAICS_21 +
_b[ en_qol:NAICS_22]*NAICS_22 + _b[ en_qol:NAICS_23]*NAICS_23 +
_b[ en_qol:NAICS_31]*NAICS_31 + _b[ en_qol:NAICS_42]*NAICS_42 +
_b[ en_qol:NAICS_44]*NAICS_44 + _b[ en_qol:NAICS_48]*NAICS_48 +
_b[ en_qol:NAICS_51]*NAICS_51 + _b[ en_qol:NAICS_52]*NAICS_52 +
_b[ en_qol:NAICS_53]*NAICS_53 + _b[ en_qol:NAICS_54]*NAICS_54 +
_b[ en_qol:NAICS_55]*NAICS_55 + _b[ en_qol:NAICS_56]*NAICS_56 +
_b[ en_qol:NAICS_61]*NAICS_61 + _b[ en_qol:NAICS_62]*NAICS_62 +
_b[ en_qol:NAICS_71]*new_naics71_15 + _b[ en_qol:NAICS_72]*NAICS_72 +
_b[ en_qol:NAICS_81]*NAICS_81 + _b[ en_qol:ln_rural]*ln_rural + _b[ en_qol:farm]*farm +
_b[ en_qol:mine]*mine + _b[ en_qol:manf]*manf + _b[ en_qol:fsgov]*fsgov + _b[ en_qol:serv]*serv +
_b[ en_qol:rec]*rec + _b[ en_qol:retire]*retire + _b[ en_qol: mega]* mega + _b[ en_qol: en_out]* en_out +
_b[ en_qol: _cons]* _cons

gen k5_20= _b[ en_qol:NAICS_11]*NAICS_11 + _b[ en_qol:NAICS_21]*NAICS_21 +
_b[ en_qol:NAICS_22]*NAICS_22 + _b[ en_qol:NAICS_23]*NAICS_23 +
_b[ en_qol:NAICS_31]*NAICS_31 + _b[ en_qol:NAICS_42]*NAICS_42 +
_b[ en_qol:NAICS_44]*NAICS_44 + _b[ en_qol:NAICS_48]*NAICS_48 +
_b[ en_qol:NAICS_51]*NAICS_51 + _b[ en_qol:NAICS_52]*NAICS_52 +
_b[ en_qol:NAICS_53]*NAICS_53 + _b[ en_qol:NAICS_54]*NAICS_54 +
_b[ en_qol:NAICS_55]*NAICS_55 + _b[ en_qol:NAICS_56]*NAICS_56 +
_b[ en_qol:NAICS_61]*NAICS_61 + _b[ en_qol:NAICS_62]*NAICS_62 +
_b[ en_qol:NAICS_71]*new_naics71_20 + _b[ en_qol:NAICS_72]*NAICS_72 +
_b[ en_qol:NAICS_81]*NAICS_81 + _b[ en_qol:ln_rural]*ln_rural + _b[ en_qol:farm]*farm +
_b[ en_qol:mine]*mine + _b[ en_qol:manf]*manf + _b[ en_qol:fsgov]*fsgov + _b[ en_qol:serv]*serv +
_b[ en_qol:rec]*rec + _b[ en_qol:retire]*retire + _b[ en_qol: mega]* mega + _b[ en_qol: en_out]* en_out +
_b[ en_qol: _cons]* _cons

gen m_qol_10=  m_qol + (k1_10-k1)
gen m_qol_15=  m_qol + (k1_15-k1)
gen m_qol_20=  m_qol + (k1_20-k1)
sum m_qol
gen sd_m_qol=(m_qol-r(mean))/r(sd)
gen sd_m_qol_10=( m_qol_10-r(mean))/r(sd)
gen sd_m_qol_15=( m_qol_15-r(mean))/r(sd)
gen sd_m_qol_20=( m_qol_20-r(mean))/r(sd)
gen delta_m_10=(m_qol_10-m_qol)/m_qol*100
gen delta_m_15=(m_qol_15-m_qol)/m_qol*100
gen delta_m_20=(m_qol_20-m_qol)/m_qol*100
gen q_m_qol = normal(sd_m_qol)
gen q_m_qol_10 = normal(sd_m_qol_10)
gen q_m_qol_15 = normal(sd_m_qol_15)
gen q_m_qol_20 = normal(sd_m_qol_20)
gen delta_q_m_10=(q_m_qol_10-q_m_qol)/q_m_qol*100
gen delta_q_m_15=(q_m_qol_15-q_m_qol)/q_m_qol*100
gen delta_q_m_20=(q_m_qol_20-q_m_qol)/q_m_qol*100

gen s_qol1_10=  s_qol1 + (k2_10-k2)
gen s_qol1_15=  s_qol1 + (k2_15-k2)
gen s_qol1_20=  s_qol1 + (k2_20-k2)
sum s_qol1
gen sd_s_qol1=(s_qol1-r(mean))/r(sd)
gen sd_s_qol1_10=( s_qol1_10-r(mean))/r(sd)
gen sd_s_qol1_15=( s_qol1_15-r(mean))/r(sd)
```

```
gen sd_s_qol1_20=( s_qol1_20-r(mean))/r(sd)
gen delta_s1_10=(s_qol1_10-s_qol1)/s_qol1*100
gen delta_s1_15=(s_qol1_15-s_qol1)/s_qol1*100
gen delta_s1_20=(s_qol1_20-s_qol1)/s_qol1*100
gen q_s_qol1 = normal(sd_s_qol1)
gen q_s_qol1_10 = normal(sd_s_qol1_10)
gen q_s_qol1_15 = normal(sd_s_qol1_15)
gen q_s_qol1_20 = normal(sd_s_qol1_20)
gen delta_q_s1_10=(q_s_qol1_10-q_s_qol1)/q_s_qol1*100
gen delta_q_s1_15=(q_s_qol1_15-q_s_qol1)/q_s_qol1*100
gen delta_q_s1_20=(q_s_qol1_20-q_s_qol1)/q_s_qol1*100

sum s_qol2
gen sd_s_qol2=(s_qol2-r(mean))/r(sd)

gen s_qol3_10=  s_qol3 + (k4_10-k4)
gen s_qol3_15=  s_qol3 + (k4_15-k4)
gen s_qol3_20=  s_qol3 + (k4_20-k4)
sum s_qol3
gen sd_s_qol3=(s_qol3-r(mean))/r(sd)
gen sd_s_qol3_10=(s_qol3_10-r(mean))/r(sd)
gen sd_s_qol3_15=( s_qol3_15-r(mean))/r(sd)
gen sd_s_qol3_20=( s_qol3_20-r(mean))/r(sd)
gen q_s_qol3 = normal(sd_s_qol3)
gen q_s_qol3_10 = normal(sd_s_qol3_10)
gen q_s_qol3_15 = normal(sd_s_qol3_15)
gen q_s_qol3_20 = normal(sd_s_qol3_20)
gen delta_q_s3_10=(q_s_qol3_10-q_s_qol3)/q_s_qol3*100
gen delta_q_s3_15=(q_s_qol3_15-q_s_qol3)/q_s_qol3*100
gen delta_q_s3_20=(q_s_qol3_20-q_s_qol3)/q_s_qol3*100

gen en_qol_10=  en_qol + (k5_10-k5)
gen en_qol_15=  en_qol + (k5_15-k5)
gen en_qol_20=  en_qol + (k5_20-k5)
sum en_qol
gen sd_en_qol=(en_qol-r(mean))/r(sd)
gen sd_en_qol_10=( en_qol_10-r(mean))/r(sd)
gen sd_en_qol_15=( en_qol_15-r(mean))/r(sd)
gen sd_en_qol_20=( en_qol_20-r(mean))/r(sd)
gen delta_en_10=(en_qol_10-en_qol)/en_qol*100
gen delta_en_15=(en_qol_15-en_qol)/en_qol*100
gen delta_en_20=(en_qol_20-en_qol)/en_qol*100
gen q_en_qol = normal(sd_en_qol)
gen q_en_qol_10 = normal(sd_en_qol_10)
gen q_en_qol_15 = normal(sd_en_qol_15)
gen q_en_qol_20 = normal(sd_en_qol_20)
gen delta_q_en_10=(q_en_qol_10-q_en_qol)/q_en_qol*100
gen delta_q_en_15=(q_en_qol_15-q_en_qol)/q_en_qol*100
gen delta_q_en_20=(q_en_qol_20-q_en_qol)/q_en_qol*100

export excel fips  county state  sd_m_qol sd_m_qol_10 sd_m_qol_15 sd_m_qol_20  sd_s_qol1 sd_s_qol1_10
sd_s_qol1_15 sd_s_qol1_20  sd_s_qol2 sd_s_qol2 sd_s_qol2 sd_s_qol2 sd_s_qol3 sd_s_qol3_10
sd_s_qol3_15 sd_s_qol3_20 sd_en_qol sd_en_qol_10 sd_en_qol_15 sd_en_qol_20 using "C:\Dropbox\00
Research\00 Dissertation\05 Work\Chapter 4 Results and Discussion\test.xls", firstrow(variables) replace
```

```
sum m_qol m_qol_10 m_qol_15 m_qol_20 delta_q_m_10 delta_q_m_15 delta_q_m_20 s_qol1 s_qol1_10
s_qol1_15 s_qol1_20 delta_q_s1_10 delta_q_s1_15 delta_q_s1_20 s_qol2 s_qol3 s_qol3_10 s_qol3_15
s_qol3_20 delta_q_s3_10 delta_q_s3_15 delta_q_s3_20 en_qol en_qol_10 en_qol_15 en_qol_20
delta_q_en_10 delta_q_en_15 delta_q_en_20

sum m_qol m_qol_10 m_qol_15 m_qol_20 delta_q_m_10 delta_q_m_15 delta_q_m_20 s_qol1 s_qol1_10
s_qol1_15 s_qol1_20 delta_q_s1_10 delta_q_s1_15 delta_q_s1_20 s_qol2 s_qol3 s_qol3_10 s_qol3_15
s_qol3_20 delta_q_s3_10 delta_q_s3_15 delta_q_s3_20 en_qol en_qol_10 en_qol_15 en_qol_20
delta_q_en_10 delta_q_en_15 delta_q_en_20 if cou_cate==1

sum m_qol m_qol_10 m_qol_15 m_qol_20 delta_q_m_10 delta_q_m_15 delta_q_m_20 s_qol1 s_qol1_10
s_qol1_15 s_qol1_20 delta_q_s1_10 delta_q_s1_15 delta_q_s1_20 s_qol2 s_qol3 s_qol3_10 s_qol3_15
s_qol3_20 delta_q_s3_10 delta_q_s3_15 delta_q_s3_20 en_qol en_qol_10 en_qol_15 en_qol_20
delta_q_en_10 delta_q_en_15 delta_q_en_20 if cou_cate==2

sum m_qol m_qol_10 m_qol_15 m_qol_20 delta_q_m_10 delta_q_m_15 delta_q_m_20 s_qol1 s_qol1_10
s_qol1_15 s_qol1_20 delta_q_s1_10 delta_q_s1_15 delta_q_s1_20 s_qol2 s_qol3 s_qol3_10 s_qol3_15
s_qol3_20 delta_q_s3_10 delta_q_s3_15 delta_q_s3_20 en_qol en_qol_10 en_qol_15 en_qol_20
delta_q_en_10 delta_q_en_15 delta_q_en_20 if cou_cate==3

sum m_qol m_qol_10 m_qol_15 m_qol_20 delta_q_m_10 delta_q_m_15 delta_q_m_20 s_qol1 s_qol1_10
s_qol1_15 s_qol1_20 delta_q_s1_10 delta_q_s1_15 delta_q_s1_20 s_qol2 s_qol3 s_qol3_10 s_qol3_15
s_qol3_20 delta_q_s3_10 delta_q_s3_15 delta_q_s3_20 en_qol en_qol_10 en_qol_15 en_qol_20
delta_q_en_10 delta_q_en_15 delta_q_en_20 if cou_cate==4
```

Appendix C. Simulation results

Table C-1: Tourism Impacts Simulation results by the U.S. counties

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
01003	Baldwin County	AL	0.603	0.637	0.654	0.669	0.203	0.279	0.314	0.348	0.888	0.888	0.888	0.888	0.603	0.616	0.621	0.627	0.515	0.533	0.541	0.549
01033	Colbert County	AL	-0.414	-0.379	-0.363	-0.348	-0.945	-0.869	-0.833	-0.800	-0.361	-0.361	-0.361	-0.361	-0.643	-0.630	-0.624	-0.619	0.343	0.361	0.370	0.378
01049	DeKalb County	AL	-1.041	-1.007	-0.990	-0.975	-2.189	-2.113	-2.078	-2.044	-0.456	-0.456	-0.456	-0.456	0.763	0.775	0.781	0.787	-0.534	-0.516	-0.507	-0.499
01055	Etowah County	AL	-0.788	-0.754	-0.737	-0.722	-1.516	-1.440	-1.405	-1.371	-0.157	-0.157	-0.157	-0.157	-0.190	-0.178	-0.172	-0.167	-0.530	-0.512	-0.504	-0.496
01073	Jefferson County	AL	-0.032	0.002	0.019	0.034	-0.345	-0.269	-0.234	-0.200	-0.136	-0.136	-0.136	-0.136	-2.308	-2.296	-2.290	-2.284	-3.879	-3.861	-3.853	-3.845
01089	Madison County	AL	0.708	0.743	0.759	0.774	0.554	0.630	0.665	0.699	0.887	0.887	0.887	0.887	-1.173	-1.161	-1.155	-1.149	-0.769	-0.751	-0.742	-0.734
01097	Mobile County	AL	-0.718	-0.683	-0.667	-0.652	-0.984	-0.908	-0.873	-0.839	-0.558	-0.558	-0.558	-0.558	-1.211	-1.199	-1.193	-1.187	0.475	0.493	0.502	0.510
01101	Montgomery County	AL	-0.556	-0.521	-0.505	-0.489	-0.236	-0.160	-0.125	-0.091	-0.825	-0.825	-0.825	-0.825	-2.051	-2.038	-2.032	-2.027	-0.600	-0.582	-0.573	-0.565
01103	Morgan County	AL	0.086	0.121	0.137	0.153	-0.766	-0.690	-0.655	-0.621	1.011	1.011	1.011	1.011	-0.719	-0.706	-0.701	-0.695	0.218	0.236	0.245	0.253
01113	Russell County	AL	-2.172	-2.137	-2.121	-2.106	-2.139	-2.063	-2.028	-1.994	-1.518	-1.518	-1.518	-1.518	-0.126	-0.113	-0.107	-0.102	-1.066	-1.048	-1.040	-1.031
01117	Shelby County	AL	1.694	1.729	1.745	1.761	0.767	0.843	0.878	0.912	0.359	0.359	0.359	0.359	0.421	0.433	0.439	0.445	0.165	0.183	0.192	0.200
01121	Talladega County	AL	-1.238	-1.203	-1.187	-1.171	-1.846	-1.770	-1.735	-1.701	-0.668	-0.668	-0.668	-0.668	-1.027	-1.015	-1.009	-1.003	-0.546	-0.528	-0.520	-0.512
01125	Tuscaloosa County	AL	-0.327	-0.292	-0.276	-0.260	-0.595	-0.520	-0.484	-0.450	0.420	0.420	0.420	0.420	-1.432	-1.420	-1.414	-1.409	0.475	0.493	0.501	0.510
01127	Walker County	AL	-0.870	-0.835	-0.819	-0.803	-2.457	-2.381	-2.345	-2.312	0.114	0.114	0.114	0.114	-0.715	-0.703	-0.697	-0.691	-0.523	-0.505	-0.497	-0.489
04001	Apache County	AZ	-3.666	-3.631	-3.615	-3.599	-2.094	-2.019	-1.983	-1.949	-1.680	-1.680	-1.680	-1.680	1.572	1.584	1.590	1.595	0.639	0.658	0.666	0.674
04003	Cochise County	AZ	-0.477	-0.443	-0.426	-0.411	-0.293	-0.217	-0.182	-0.148	-0.344	-0.344	-0.344	-0.344	-0.203	-0.191	-0.185	-0.179	0.325	0.343	0.351	0.360
04005	Coconino County	AZ	-0.252	-0.218	-0.201	-0.186	0.295	0.371	0.406	0.440	0.658	0.658	0.658	0.658	-0.702	-0.690	-0.684	-0.679	0.380	0.398	0.406	0.414
04007	Gila County	AZ	-0.864	-0.829	-0.813	-0.798	-0.896	-0.820	-0.785	-0.751	-0.370	-0.370	-0.370	-0.370	0.339	0.351	0.357	0.362	-2.707	-2.689	-2.681	-2.673
04013	Maricopa County	AZ	0.323	0.357	0.374	0.389	0.054	0.130	0.165	0.199	0.567	0.567	0.567	0.567	-1.244	-1.231	-1.225	-1.220	-3.044	-3.026	-3.017	-3.009
04015	Mohave County	AZ	-1.096	-1.062	-1.045	-1.030	-1.893	-1.817	-1.782	-1.748	-0.498	-0.498	-0.498	-0.498	-0.489	-0.477	-0.471	-0.466	0.510	0.528	0.536	0.544
04017	Navajo County	AZ	-2.006	-1.971	-1.955	-1.939	-1.826	-1.750	-1.715	-1.681	0.121	0.121	0.121	0.121	-1.858	-1.845	-1.840	-1.834	0.236	0.254	0.263	0.271
04019	Pima County	AZ	-0.310	-0.275	-0.259	-0.243	0.220	0.296	0.331	0.365	0.516	0.516	0.516	0.516	-0.187	-0.174	-0.169	-0.163	0.011	0.029	0.038	0.046

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
04021	Pinal County	AZ	-0.305	-0.270	-0.254	-0.238	-0.881	-0.805	-0.769	-0.736	0.225	0.225	0.225	0.225	-0.384	-0.371	-0.366	-0.360	-3.665	-3.647	-3.639	-3.631
04023	Santa Cruz County	AZ	-1.822	-1.787	-1.771	-1.755	-1.071	-0.995	-0.960	-0.926	-0.058	-0.058	-0.058	-0.058	-0.270	-0.258	-0.252	-0.246	-0.973	-0.955	-0.947	-0.939
04025	Yavapai County	AZ	-0.363	-0.328	-0.312	-0.297	0.343	0.419	0.454	0.488	1.010	1.010	1.010	1.010	0.450	0.462	0.468	0.474	0.455	0.473	0.481	0.489
04027	Yuma County	AZ	-3.384	-3.349	-3.333	-3.317	-1.354	-1.278	-1.243	-1.209	0.456	0.456	0.456	0.456	-0.020	-0.007	-0.001	0.004	-0.105	-0.087	-0.079	-0.071
05045	Faulkner County	AR	-0.346	-0.311	-0.295	-0.280	-0.428	-0.352	-0.316	-0.283	1.041	1.041	1.041	1.041	-0.656	-0.644	-0.638	-0.632	-0.393	-0.375	-0.367	-0.359
05051	Garland County	AR	-0.749	-0.715	-0.698	-0.683	-0.544	-0.468	-0.433	-0.399	0.569	0.569	0.569	0.569	-2.258	-2.245	-2.240	-2.234	-0.324	-0.306	-0.298	-0.290
05107	Phillips County	AR	-3.457	-3.423	-3.406	-3.391	-2.345	-2.269	-2.233	-2.200	-1.188	-1.188	-1.188	-1.188	-1.919	-1.906	-1.900	-1.895	-0.094	-0.076	-0.067	-0.059
05113	Polk County	AR	-1.361	-1.326	-1.310	-1.294	-1.522	-1.446	-1.410	-1.377	-0.371	-0.371	-0.371	-0.371	0.744	0.756	0.762	0.768	0.347	0.365	0.373	0.382
05115	Pope County	AR	-0.460	-0.425	-0.409	-0.393	-0.760	-0.685	-0.649	-0.615	0.626	0.626	0.626	0.626	-0.426	-0.414	-0.408	-0.403	-0.291	-0.273	-0.265	-0.257
05119	Pulaski County	AR	-0.277	-0.243	-0.226	-0.211	-0.204	-0.128	-0.093	-0.059	0.227	0.227	0.227	0.227	-3.113	-3.100	-3.095	-3.089	-0.971	-0.953	-0.945	-0.937
05131	Sebastian County	AR	-0.664	-0.629	-0.613	-0.598	-1.153	-1.077	-1.042	-1.008	-0.060	-0.060	-0.060	-0.060	-1.172	-1.160	-1.154	-1.149	-0.163	-0.145	-0.137	-0.129
05139	Union County	AR	-1.141	-1.106	-1.090	-1.074	-1.517	-1.442	-1.406	-1.372	1.416	1.416	1.416	1.416	-0.842	-0.829	-0.823	-0.818	0.664	0.682	0.690	0.698
05143	Washington County	AR	-0.191	-0.156	-0.140	-0.125	-0.402	-0.326	-0.290	-0.257	0.645	0.645	0.645	0.645	-0.533	-0.521	-0.515	-0.510	0.631	0.649	0.657	0.665
05145	White County	AR	-0.799	-0.764	-0.748	-0.732	-1.132	-1.056	-1.021	-0.987	0.043	0.043	0.043	0.043	-0.489	-0.476	-0.471	-0.465	-0.004	0.014	0.022	0.030
06001	Alameda County	CA	0.826	0.861	0.877	0.893	1.009	1.084	1.120	1.154	-0.361	-0.361	-0.361	-0.361	-1.203	-1.191	-1.185	-1.179	-0.868	-0.850	-0.841	-0.833
06005	Amador County	CA	0.095	0.129	0.146	0.161	0.068	0.143	0.179	0.213	-2.140	-2.140	-2.140	-2.140	0.468	0.481	0.487	0.492	0.142	0.160	0.169	0.177
06007	Butte County	CA	-1.507	-1.473	-1.456	-1.441	-0.164	-0.088	-0.053	-0.019	-0.530	-0.530	-0.530	-0.530	-0.103	-0.090	-0.084	-0.079	0.083	0.101	0.110	0.118
06009	Calaveras County	CA	-0.249	-0.214	-0.198	-0.183	0.387	0.463	0.498	0.532	0.557	0.557	0.557	0.557	1.066	1.078	1.084	1.089	0.182	0.200	0.209	0.217
06013	Contra Costa County	CA	1.128	1.162	1.179	1.194	1.062	1.138	1.173	1.207	-0.708	-0.708	-0.708	-0.708	-0.495	-0.483	-0.477	-0.471	0.240	0.258	0.267	0.275
06017	El Dorado County	CA	0.805	0.840	0.856	0.872	1.015	1.091	1.127	1.160	0.216	0.216	0.216	0.216	0.874	0.887	0.892	0.898	-0.052	-0.034	-0.026	-0.017
06019	Fresno County	CA	-1.840	-1.805	-1.789	-1.774	-1.107	-1.032	-0.996	-0.962	-1.031	-1.031	-1.031	-1.031	-1.117	-1.105	-1.099	-1.094	-3.835	-3.817	-3.809	-3.801
06025	Imperial County	CA	-4.398	-4.363	-4.347	-4.332	-1.831	-1.755	-1.720	-1.686	0.868	0.868	0.868	0.868	-0.821	-0.809	-0.803	-0.797	-0.686	-0.668	-0.660	-0.652
06027	Inyo County	CA	-0.143	-0.108	-0.092	-0.076	0.198	0.274	0.309	0.343	-1.449	-1.449	-1.449	-1.449	0.600	0.612	0.618	0.623	-0.161	-0.143	-0.134	-0.126
06029	Kern County	CA	-1.524	-1.489	-1.473	-1.458	-1.812	-1.736	-1.701	-1.667	-1.158	-1.158	-1.158	-1.158	-1.074	-1.061	-1.056	-1.050	-4.898	-4.880	-4.871	-4.863
06033	Lake County	CA	-1.731	-1.697	-1.680	-1.665	-1.143	-1.067	-1.031	-0.998	-2.590	-2.590	-2.590	-2.590	0.023	0.035	0.041	0.047	0.830	0.848	0.856	0.864
06037	Los Angeles County	CA	-0.257	-0.222	-0.206	-0.190	0.145	0.221	0.257	0.290	-1.027	-1.027	-1.027	-1.027	-0.360	-0.348	-0.342	-0.337	-5.398	-5.380	-5.372	-5.364
06039	Madera County	CA	-1.201	-1.166	-1.150	-1.134	-1.693	-1.617	-1.582	-1.548	0.329	0.329	0.329	0.329	0.074	0.086	0.092	0.098	0.055	0.073	0.082	0.090

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
06041	Marin County	CA	1.827	1.862	1.878	1.893	2.536	2.612	2.647	2.681	-0.166	-0.166	-0.166	-0.166	0.611	0.624	0.629	0.635	0.845	0.863	0.871	0.879
06043	Mariposa County	CA	-0.567	-0.532	-0.516	-0.501	0.445	0.520	0.556	0.589	-1.313	-1.313	-1.313	-1.313	1.250	1.263	1.268	1.274	-0.309	-0.291	-0.283	-0.275
06045	Mendocino County	CA	-0.860	-0.825	-0.809	-0.793	0.005	0.081	0.116	0.150	-0.963	-0.963	-0.963	-0.963	0.603	0.615	0.621	0.627	0.837	0.855	0.864	0.872
06047	Merced County	CA	-2.191	-2.156	-2.140	-2.125	-1.944	-1.868	-1.833	-1.799	-0.644	-0.644	-0.644	-0.644	-0.874	-0.862	-0.856	-0.850	-0.478	-0.460	-0.452	-0.444
06053	Monterey County	CA	-0.088	-0.053	-0.037	-0.022	-0.254	-0.178	-0.143	-0.109	-0.840	-0.840	-0.840	-0.840	-0.286	-0.273	-0.268	-0.262	0.845	0.863	0.871	0.879
06057	Nevada County	CA	0.405	0.440	0.456	0.472	1.390	1.466	1.501	1.535	-0.192	-0.192	-0.192	-0.192	1.139	1.151	1.157	1.163	-0.441	-0.423	-0.415	-0.407
06059	Orange County	CA	1.146	1.181	1.197	1.213	0.950	1.025	1.061	1.095	0.164	0.164	0.164	0.164	0.250	0.263	0.268	0.274	-2.283	-2.265	-2.256	-2.248
06061	Placer County	CA	1.200	1.235	1.251	1.267	1.364	1.440	1.475	1.509	1.949	1.949	1.949	1.949	0.476	0.489	0.494	0.500	-0.073	-0.055	-0.047	-0.039
06065	Riverside County	CA	-0.141	-0.106	-0.090	-0.075	-0.786	-0.710	-0.675	-0.641	0.010	0.010	0.010	0.010	-0.500	-0.488	-0.482	-0.477	-4.964	-4.946	-4.937	-4.929
06067	Sacramento County	CA	0.004	0.039	0.055	0.071	-0.003	0.073	0.108	0.142	-0.477	-0.477	-0.477	-0.477	-0.863	-0.851	-0.845	-0.839	-0.700	-0.682	-0.673	-0.665
06071	San Bernardino County	CA	-0.321	-0.286	-0.270	-0.254	-1.297	-1.222	-1.186	-1.152	0.048	0.048	0.048	0.048	-0.525	-0.512	-0.507	-0.501	-2.540	-2.522	-2.514	-2.506
06073	San Diego County	CA	0.465	0.500	0.516	0.532	0.749	0.825	0.860	0.894	-0.076	-0.076	-0.076	-0.076	-0.177	-0.164	-0.159	-0.153	-3.044	-3.026	-3.017	-3.009
06075	San Francisco County	CA	1.017	1.052	1.068	1.084	1.676	1.752	1.787	1.821	-1.640	-1.640	-1.640	-1.640	-1.483	-1.471	-1.465	-1.459	-0.356	-0.338	-0.330	-0.322
06077	San Joaquin County	CA	-0.901	-0.867	-0.850	-0.835	-1.172	-1.097	-1.061	-1.027	-0.716	-0.716	-0.716	-0.716	-1.816	-1.803	-1.797	-1.792	-0.504	-0.486	-0.477	-0.469
06079	San Luis Obispo County	CA	0.464	0.499	0.515	0.531	1.068	1.144	1.179	1.213	-0.176	-0.176	-0.176	-0.176	0.493	0.506	0.511	0.517	-0.405	-0.386	-0.378	-0.370
06081	San Mateo County	CA	1.720	1.754	1.771	1.786	1.544	1.619	1.655	1.689	-0.081	-0.081	-0.081	-0.081	0.130	0.143	0.149	0.154	-0.128	-0.110	-0.101	-0.093
06083	Santa Barbara County	CA	0.487	0.522	0.538	0.554	0.851	0.926	0.962	0.996	0.284	0.284	0.284	0.284	0.270	0.282	0.288	0.294	0.240	0.258	0.267	0.275
06085	Santa Clara County	CA	1.540	1.575	1.591	1.607	1.361	1.437	1.473	1.506	-0.209	-0.209	-0.209	-0.209	-0.074	-0.062	-0.056	-0.051	-0.713	-0.695	-0.687	-0.679
06087	Santa Cruz County	CA	0.305	0.340	0.356	0.372	1.348	1.424	1.459	1.493	-0.885	-0.885	-0.885	-0.885	-0.166	-0.154	-0.148	-0.142	0.852	0.870	0.879	0.887
06089	Shasta County	CA	-1.436	-1.401	-1.385	-1.370	-0.587	-0.512	-0.476	-0.442	1.177	1.177	1.177	1.177	0.007	0.020	0.025	0.031	0.334	0.352	0.361	0.369
06093	Siskiyou County	CA	-1.634	-1.599	-1.583	-1.567	0.074	0.150	0.185	0.219	1.241	1.241	1.241	1.241	0.789	0.801	0.807	0.813	0.773	0.791	0.800	0.808
06095	Solano County	CA	0.827	0.862	0.878	0.894	-0.014	0.062	0.098	0.131	-0.410	-0.410	-0.410	-0.410	-0.627	-0.615	-0.609	-0.603	-0.986	-0.968	-0.960	-0.952
06097	Sonoma County	CA	0.668	0.702	0.719	0.734	1.035	1.110	1.146	1.180	0.257	0.257	0.257	0.257	0.632	0.644	0.650	0.656	0.791	0.809	0.817	0.825
06099	Stanislaus County	CA	-1.007	-0.972	-0.956	-0.940	-1.304	-1.228	-1.193	-1.159	-0.192	-0.192	-0.192	-0.192	-1.261	-1.248	-1.243	-1.237	-1.895	-1.877	-1.869	-1.861
06101	Sutter County	CA	-1.368	-1.333	-1.317	-1.301	-0.705	-0.629	-0.593	-0.560	1.618	1.618	1.618	1.618	-0.110	-0.098	-0.092	-0.087	-0.084	-0.066	-0.058	-0.050
06103	Tehama County	CA	-1.410	-1.376	-1.359	-1.344	-1.228	-1.153	-1.117	-1.083	1.094	1.094	1.094	1.094	0.362	0.374	0.380	0.386	0.136	0.154	0.162	0.170
06107	Tulare County	CA	-1.802	-1.768	-1.751	-1.736	-2.152	-2.076	-2.040	-2.007	-1.840	-1.840	-1.840	-1.840	-1.149	-1.136	-1.131	-1.125	-1.594	-1.576	-1.568	-1.560

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
06109	Tuolumne County	CA	-0.369	-0.335	-0.318	-0.303	0.107	0.183	0.218	0.252	-2.226	-2.226	-2.226	-2.226	0.574	0.586	0.592	0.597	0.192	0.210	0.219	0.227
06111	Ventura County	CA	1.102	1.137	1.153	1.169	0.766	0.842	0.877	0.911	-0.932	-0.932	-0.932	-0.932	0.466	0.478	0.484	0.489	-0.542	-0.524	-0.515	-0.507
06113	Yolo County	CA	-0.097	-0.062	-0.046	-0.030	0.668	0.744	0.780	0.813	-1.304	-1.304	-1.304	-1.304	-0.724	-0.711	-0.706	-0.700	0.504	0.522	0.530	0.538
08001	Adams County	CO	0.401	0.435	0.452	0.467	-0.206	-0.131	-0.095	-0.061	0.358	0.358	0.358	0.358	-0.308	-0.295	-0.290	-0.284	-0.344	-0.326	-0.318	-0.310
08005	Arapahoe County	CO	0.747	0.782	0.798	0.813	1.316	1.392	1.427	1.461	-0.047	-0.047	-0.047	-0.047	-0.093	-0.081	-0.075	-0.069	0.784	0.802	0.811	0.819
08013	Boulder County	CO	1.084	1.118	1.135	1.150	1.973	2.049	2.085	2.118	0.848	0.848	0.848	0.848	0.203	0.215	0.221	0.227	0.183	0.201	0.209	0.217
08029	Delta County	CO	0.029	0.064	0.080	0.096	0.108	0.184	0.219	0.253	-0.101	-0.101	-0.101	-0.101	1.086	1.098	1.104	1.110	0.862	0.880	0.889	0.897
08031	Denver County	CO	-0.469	-0.434	-0.418	-0.402	0.663	0.739	0.774	0.808	-0.187	-0.187	-0.187	-0.187	-0.644	-0.631	-0.626	-0.620	0.011	0.029	0.038	0.046
08035	Douglas County	CO	2.422	2.456	2.473	2.488	2.346	2.422	2.457	2.491	1.508	1.508	1.508	1.508	0.997	1.009	1.015	1.020	0.073	0.091	0.099	0.107
08041	El Paso County	CO	0.560	0.595	0.611	0.627	0.772	0.847	0.883	0.917	0.677	0.677	0.677	0.677	-0.360	-0.347	-0.342	-0.336	0.380	0.398	0.406	0.414
08045	Garfield County	CO	1.473	1.508	1.524	1.539	0.305	0.381	0.416	0.450	0.410	0.410	0.410	0.410	0.845	0.857	0.863	0.869	-0.106	-0.088	-0.079	-0.071
08051	Gunnison County	CO	0.321	0.355	0.372	0.387	2.446	2.522	2.557	2.591	1.065	1.065	1.065	1.065	0.294	0.306	0.312	0.317	0.819	0.837	0.845	0.853
08059	Jefferson County	CO	1.180	1.214	1.231	1.246	1.426	1.501	1.537	1.571	0.896	0.896	0.896	0.896	0.136	0.148	0.154	0.159	0.073	0.091	0.099	0.107
08067	La Plata County	CO	0.778	0.813	0.829	0.845	1.649	1.725	1.760	1.794	1.545	1.545	1.545	1.545	0.252	0.264	0.270	0.275	0.250	0.268	0.276	0.284
08069	Larimer County	CO	0.636	0.670	0.687	0.702	1.914	1.990	2.025	2.059	0.660	0.660	0.660	0.660	0.258	0.271	0.276	0.282	0.011	0.029	0.038	0.046
08077	Mesa County	CO	0.674	0.709	0.725	0.741	0.414	0.490	0.525	0.559	-0.105	-0.105	-0.105	-0.105	0.170	0.183	0.189	0.194	-0.073	-0.055	-0.047	-0.039
08083	Montezuma County	CO	-0.378	-0.343	-0.327	-0.311	0.353	0.429	0.465	0.498	-0.324	-0.324	-0.324	-0.324	0.524	0.536	0.542	0.548	0.476	0.494	0.503	0.511
08097	Pitkin County	CO	1.760	1.795	1.811	1.826	2.819	2.895	2.930	2.964	2.139	2.139	2.139	2.139	-0.382	-0.370	-0.364	-0.359	0.935	0.953	0.961	0.969
08101	Pueblo County	CO	-0.687	-0.653	-0.636	-0.621	-0.264	-0.188	-0.153	-0.119	-0.136	-0.136	-0.136	-0.136	0.619	0.631	0.637	0.643	0.700	0.718	0.726	0.734
08107	Routt County	CO	1.414	1.449	1.465	1.481	1.974	2.049	2.085	2.118	2.899	2.899	2.899	2.899	0.418	0.431	0.437	0.442	0.752	0.770	0.778	0.786
08117	Summit County	CO	1.348	1.383	1.399	1.414	2.075	2.151	2.186	2.220	1.991	1.991	1.991	1.991	-1.669	-1.657	-1.651	-1.645	0.907	0.925	0.934	0.942
08119	Teller County	CO	0.801	0.835	0.852	0.867	1.423	1.499	1.534	1.568	0.466	0.466	0.466	0.466	1.533	1.546	1.551	1.557	-0.528	-0.510	-0.502	-0.494
08123	Weld County	CO	0.407	0.442	0.458	0.473	0.318	0.394	0.429	0.463	0.669	0.669	0.669	0.669	0.254	0.267	0.272	0.278	0.278	0.296	0.305	0.313
09001	Fairfield County	CT	1.547	1.582	1.598	1.614	1.524	1.600	1.635	1.669	-0.005	-0.005	-0.005	-0.005	0.357	0.369	0.375	0.381	-0.262	-0.244	-0.236	-0.228
09003	Hartford County	CT	0.673	0.707	0.724	0.739	0.876	0.952	0.987	1.021	-0.524	-0.524	-0.524	-0.524	-0.037	-0.025	-0.019	-0.013	0.053	0.071	0.079	0.087
09005	Litchfield County	CT	1.268	1.302	1.319	1.334	1.264	1.340	1.375	1.409	-0.958	-0.958	-0.958	-0.958	-0.455	-0.443	-0.437	-0.432	0.598	0.616	0.624	0.632
09007	Middlesex County	CT	1.546	1.581	1.597	1.613	1.419	1.495	1.530	1.564	-0.857	-0.857	-0.857	-0.857	0.878	0.891	0.897	0.902	0.515	0.533	0.542	0.550

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
09009	New Haven County	CT	0.509	0.544	0.560	0.576	0.644	0.720	0.755	0.789	-0.742	-0.742	-0.742	-0.742	-0.359	-0.347	-0.341	-0.335	-0.429	-0.411	-0.403	-0.394
09011	New London County	CT	1.139	1.174	1.190	1.206	0.716	0.792	0.827	0.861	0.561	0.561	0.561	0.561	0.977	0.989	0.995	1.001	0.086	0.104	0.112	0.120
09013	Tolland County	CT	1.469	1.504	1.520	1.536	1.396	1.471	1.507	1.541	-0.234	-0.234	-0.234	-0.234	1.624	1.636	1.642	1.647	0.498	0.516	0.524	0.533
10001	Kent County	DE	0.548	0.583	0.599	0.615	-0.611	-0.536	-0.500	-0.466	-0.073	-0.073	-0.073	-0.073	-0.491	-0.479	-0.473	-0.468	-0.118	-0.100	-0.091	-0.083
10003	New Castle County	DE	0.911	0.946	0.962	0.977	0.576	0.651	0.687	0.721	0.665	0.665	0.665	0.665	-0.769	-0.756	-0.751	-0.745	-1.190	-1.172	-1.164	-1.156
10005	Sussex County	DE	0.120	0.155	0.171	0.187	0.078	0.154	0.189	0.223	0.675	0.675	0.675	0.675	-0.175	-0.163	-0.157	-0.152	-0.325	-0.307	-0.299	-0.291
11001	District of Columbia	DC	-0.120	-0.086	-0.069	-0.054	0.338	0.413	0.449	0.483	-0.277	-0.277	-0.277	-0.277	-2.473	-2.461	-2.455	-2.450	-0.825	-0.807	-0.798	-0.790
12001	Alachua County	FL	-0.620	-0.585	-0.569	-0.553	0.961	1.036	1.072	1.106	0.773	0.773	0.773	0.773	-1.217	-1.205	-1.199	-1.194	0.768	0.786	0.794	0.802
12005	Bay County	FL	-0.047	-0.012	0.004	0.020	-0.153	-0.078	-0.042	-0.009	1.708	1.708	1.708	1.708	-0.660	-0.648	-0.642	-0.636	0.452	0.470	0.478	0.486
12009	Brevard County	FL	0.039	0.074	0.090	0.105	0.701	0.777	0.812	0.846	-0.496	-0.496	-0.496	-0.496	-0.257	-0.244	-0.239	-0.233	0.353	0.371	0.379	0.387
12011	Broward County	FL	0.212	0.247	0.263	0.278	0.475	0.551	0.586	0.620	-0.457	-0.457	-0.457	-0.457	-0.953	-0.941	-0.935	-0.929	0.123	0.141	0.150	0.158
12017	Citrus County	FL	-1.145	-1.111	-1.094	-1.079	-0.271	-0.195	-0.160	-0.126	-0.058	-0.058	-0.058	-0.058	0.884	0.897	0.903	0.908	0.606	0.624	0.632	0.640
12021	Collier County	FL	0.448	0.483	0.499	0.514	1.428	1.504	1.539	1.573	0.633	0.633	0.633	0.633	0.662	0.674	0.680	0.686	0.531	0.549	0.557	0.565
12023	Columbia County	FL	-0.862	-0.827	-0.811	-0.795	-1.568	-1.492	-1.457	-1.423	-0.013	-0.013	-0.013	-0.013	-0.489	-0.476	-0.471	-0.465	-0.522	-0.504	-0.495	-0.487
12031	Duval County	FL	0.049	0.083	0.100	0.115	-0.306	-0.231	-0.195	-0.161	0.089	0.089	0.089	0.089	-2.088	-2.076	-2.070	-2.065	-0.172	-0.154	-0.145	-0.137
12033	Escambia County	FL	-0.638	-0.603	-0.587	-0.572	-0.083	-0.008	0.028	0.062	1.003	1.003	1.003	1.003	-0.824	-0.812	-0.806	-0.800	-0.633	-0.615	-0.606	-0.598
12055	Highlands County	FL	-1.315	-1.281	-1.264	-1.249	-0.295	-0.219	-0.184	-0.150	0.723	0.723	0.723	0.723	0.399	0.411	0.417	0.423	0.852	0.870	0.879	0.887
12057	Hillsborough County	FL	-0.162	-0.127	-0.111	-0.095	0.107	0.183	0.218	0.252	0.635	0.635	0.635	0.635	-0.993	-0.981	-0.975	-0.969	-0.529	-0.511	-0.502	-0.494
12069	Lake County	FL	-0.084	-0.049	-0.033	-0.017	0.475	0.550	0.586	0.620	1.473	1.473	1.473	1.473	0.359	0.371	0.377	0.382	0.371	0.389	0.397	0.405
12071	Lee County	FL	-0.172	-0.137	-0.121	-0.105	0.499	0.574	0.610	0.644	0.420	0.420	0.420	0.420	-0.312	-0.300	-0.294	-0.288	0.791	0.809	0.817	0.825
12073	Leon County	FL	-0.340	-0.305	-0.289	-0.273	1.340	1.416	1.451	1.485	0.789	0.789	0.789	0.789	-1.129	-1.116	-1.111	-1.105	-1.078	-1.060	-1.052	-1.044
12081	Manatee County	FL	-0.267	-0.232	-0.216	-0.200	0.630	0.706	0.741	0.775	0.798	0.798	0.798	0.798	-1.166	-1.154	-1.148	-1.143	0.600	0.618	0.626	0.634
12083	Marion County	FL	-1.017	-0.982	-0.966	-0.950	-0.285	-0.209	-0.174	-0.140	-0.008	-0.008	-0.008	-0.008	0.392	0.405	0.410	0.416	0.334	0.352	0.361	0.369
12086	Miami-Dade County	FL	-0.606	-0.571	-0.555	-0.539	0.166	0.242	0.277	0.311	-0.498	-0.498	-0.498	-0.498	-2.016	-2.004	-1.998	-1.993	-0.052	-0.034	-0.026	-0.017
12089	Nassau County	FL	0.737	0.771	0.787	0.803	0.246	0.322	0.357	0.391	-0.322	-0.322	-0.322	-0.322	0.045	0.057	0.063	0.069	0.731	0.749	0.757	0.765
12091	Okaloosa County	FL	0.703	0.738	0.754	0.770	0.564	0.640	0.675	0.709	0.372	0.372	0.372	0.372	0.082	0.095	0.101	0.106	0.957	0.975	0.983	0.991
12095	Orange County	FL	-0.024	0.011	0.027	0.042	0.302	0.378	0.413	0.447	0.373	0.373	0.373	0.373	-2.150	-2.137	-2.131	-2.126	0.173	0.191	0.199	0.207

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
12099	Palm Beach County	FL	0.096	0.131	0.147	0.162	1.052	1.128	1.164	1.197	0.748	0.748	0.748	0.748	-0.943	-0.930	-0.925	-0.919	0.639	0.657	0.665	0.673
12101	Pasco County	FL	-0.621	-0.586	-0.570	-0.554	-0.285	-0.209	-0.174	-0.140	0.022	0.022	0.022	0.022	-0.325	-0.313	-0.307	-0.302	0.736	0.754	0.762	0.770
12103	Pinellas County	FL	-0.112	-0.077	-0.061	-0.046	0.465	0.540	0.576	0.610	-0.198	-0.198	-0.198	-0.198	-1.026	-1.014	-1.008	-1.003	-0.194	-0.176	-0.168	-0.160
12105	Polk County	FL	-0.575	-0.540	-0.524	-0.508	-0.525	-0.449	-0.414	-0.380	0.055	0.055	0.055	0.055	-0.623	-0.611	-0.605	-0.600	0.288	0.306	0.314	0.322
12107	Putnam County	FL	-1.820	-1.785	-1.769	-1.753	-1.480	-1.404	-1.369	-1.335	-0.696	-0.696	-0.696	-0.696	-1.652	-1.639	-1.634	-1.628	0.883	0.901	0.909	0.917
12111	St. Lucie County	FL	-0.712	-0.677	-0.661	-0.645	-0.045	0.031	0.066	0.100	0.222	0.222	0.222	0.222	-0.048	-0.036	-0.030	-0.025	0.306	0.325	0.333	0.341
12113	Santa Rosa County	FL	0.384	0.419	0.435	0.451	0.290	0.366	0.401	0.435	-0.635	-0.635	-0.635	-0.635	1.087	1.099	1.105	1.111	0.123	0.141	0.150	0.158
12115	Sarasota County	FL	-0.023	0.012	0.028	0.044	1.384	1.459	1.495	1.529	0.758	0.758	0.758	0.758	-0.288	-0.276	-0.270	-0.265	0.521	0.539	0.548	0.556
12117	Seminole County	FL	0.627	0.661	0.678	0.693	1.042	1.118	1.154	1.187	1.307	1.307	1.307	1.307	-0.058	-0.046	-0.040	-0.034	0.752	0.770	0.778	0.786
12127	Volusia County	FL	-0.302	-0.268	-0.251	-0.236	-0.018	0.058	0.093	0.127	-0.364	-0.364	-0.364	-0.364	-0.473	-0.460	-0.455	-0.449	0.343	0.362	0.370	0.378
13021	Bibb County	GA	-1.273	-1.238	-1.222	-1.207	-1.079	-1.003	-0.968	-0.934	-0.279	-0.279	-0.279	-0.279	-2.670	-2.658	-2.652	-2.647	-1.273	-1.255	-1.247	-1.238
13051	Chatham County	GA	-0.506	-0.472	-0.455	-0.440	-0.216	-0.140	-0.105	-0.071	0.152	0.152	0.152	0.152	-1.752	-1.739	-1.734	-1.728	-0.811	-0.793	-0.784	-0.776
13059	Clarke County	GA	-2.079	-2.045	-2.028	-2.013	0.176	0.251	0.287	0.321	-0.248	-0.248	-0.248	-0.248	-2.322	-2.310	-2.304	-2.298	-0.580	-0.562	-0.554	-0.546
13067	Cobb County	GA	1.011	1.046	1.062	1.077	1.145	1.220	1.256	1.290	0.815	0.815	0.815	0.815	-0.135	-0.122	-0.117	-0.111	-0.675	-0.657	-0.649	-0.641
13069	Coffee County	GA	-1.870	-1.835	-1.819	-1.803	-2.264	-2.188	-2.153	-2.119	1.417	1.417	1.417	1.417	-1.612	-1.599	-1.593	-1.588	0.136	0.154	0.163	0.171
13073	Columbia County	GA	1.222	1.257	1.273	1.288	0.705	0.781	0.816	0.850	1.291	1.291	1.291	1.291	0.455	0.467	0.473	0.479	0.438	0.456	0.465	0.473
13077	Coweta County	GA	0.674	0.709	0.725	0.740	-0.128	-0.053	-0.017	0.017	1.740	1.740	1.740	1.740	0.394	0.406	0.412	0.417	-0.533	-0.514	-0.506	-0.498
13089	DeKalb County	GA	-0.120	-0.085	-0.069	-0.054	0.695	0.771	0.806	0.840	-0.001	-0.001	-0.001	-0.001	-2.294	-2.281	-2.275	-2.270	-1.771	-1.753	-1.744	-1.736
13095	Dougherty County	GA	-1.915	-1.880	-1.864	-1.848	-1.337	-1.261	-1.226	-1.192	1.097	1.097	1.097	1.097	-2.217	-2.204	-2.199	-2.193	-1.478	-1.460	-1.452	-1.444
13113	Fayette County	GA	1.728	1.762	1.779	1.794	1.665	1.741	1.776	1.810	1.492	1.492	1.492	1.492	0.874	0.887	0.892	0.898	0.495	0.513	0.522	0.530
13115	Floyd County	GA	0.096	0.131	0.147	0.162	1.052	1.128	1.164	1.197	0.748	0.748	0.748	0.748	-0.943	-0.930	-0.925	-0.919	0.639	0.657	0.665	0.673
13121	Fulton County	GA	-0.621	-0.586	-0.570	-0.554	-0.285	-0.209	-0.174	-0.140	0.022	0.022	0.022	0.022	-0.325	-0.313	-0.307	-0.302	0.736	0.754	0.762	0.770
13135	Gwinnett County	GA	-0.112	-0.077	-0.061	-0.046	0.465	0.540	0.576	0.610	-0.198	-0.198	-0.198	-0.198	-1.026	-1.014	-1.008	-1.003	-0.194	-0.176	-0.168	-0.160
13139	Hall County	GA	-0.575	-0.540	-0.524	-0.508	-0.525	-0.449	-0.414	-0.380	0.055	0.055	0.055	0.055	-0.623	-0.611	-0.605	-0.600	0.288	0.306	0.314	0.322
13151	Henry County	GA	-1.820	-1.785	-1.769	-1.753	-1.480	-1.404	-1.369	-1.335	-0.696	-0.696	-0.696	-0.696	-1.652	-1.639	-1.634	-1.628	0.883	0.901	0.909	0.917
13153	Houston County	GA	-0.712	-0.677	-0.661	-0.645	-0.045	0.031	0.066	0.100	0.222	0.222	0.222	0.222	-0.048	-0.036	-0.030	-0.025	0.306	0.325	0.333	0.341
13213	Murray County	GA	0.384	0.419	0.435	0.451	0.290	0.366	0.401	0.435	-0.635	-0.635	-0.635	-0.635	1.087	1.099	1.105	1.111	0.123	0.141	0.150	0.158

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
13215	Muscogee County	GA	-0.910	-0.875	-0.859	-0.844	-1.366	-1.291	-1.255	-1.221	0.695	0.695	0.695	0.695	-0.520	-0.508	-0.502	-0.497	-1.334	-1.316	-1.307	-1.299
13223	Paulding County	GA	0.196	0.231	0.247	0.263	0.484	0.560	0.595	0.629	-0.072	-0.072	-0.072	-0.072	-2.848	-2.836	-2.830	-2.824	-2.595	-2.577	-2.568	-2.560
13245	Richmond County	GA	0.872	0.906	0.923	0.938	0.320	0.395	0.431	0.465	0.865	0.865	0.865	0.865	-0.355	-0.342	-0.337	-0.331	-0.651	-0.633	-0.624	-0.616
13247	Rockdale County	GA	0.099	0.134	0.150	0.165	-0.826	-0.750	-0.714	-0.681	1.596	1.596	1.596	1.596	0.096	0.108	0.114	0.119	-1.774	-1.756	-1.747	-1.739
13261	Sumter County	GA	0.783	0.817	0.834	0.849	-0.223	-0.147	-0.112	-0.078	0.951	0.951	0.951	0.951	0.001	0.013	0.019	0.024	-0.631	-0.613	-0.605	-0.597
13295	Walker County	GA	0.521	0.556	0.572	0.588	-0.307	-0.231	-0.196	-0.162	1.597	1.597	1.597	1.597	-0.778	-0.765	-0.760	-0.754	-1.330	-1.312	-1.304	-1.296
13297	Walton County	GA	-0.651	-0.616	-0.600	-0.585	-3.036	-2.960	-2.925	-2.891	-2.119	-2.119	-2.119	-2.119	0.528	0.540	0.546	0.552	0.237	0.255	0.264	0.272
13303	Washington County	GA	-0.930	-0.895	-0.879	-0.863	-1.102	-1.027	-0.991	-0.957	-0.101	-0.101	-0.101	-0.101	-3.305	-3.293	-3.287	-3.281	-0.747	-0.729	-0.721	-0.713
15001	Hawaii County	HI	0.891	0.925	0.942	0.957	-0.433	-0.357	-0.322	-0.288	1.104	1.104	1.104	1.104	0.221	0.233	0.239	0.245	-0.466	-0.448	-0.440	-0.432
15003	Honolulu County	HI	-1.704	-1.670	-1.653	-1.638	-1.414	-1.338	-1.302	-1.269	-0.138	-0.138	-0.138	-0.138	-2.813	-2.801	-2.795	-2.789	-1.025	-1.007	-0.998	-0.990
15009	Maui County	HI	0.121	0.155	0.172	0.187	-0.099	-0.023	0.012	0.046	0.180	0.180	0.180	0.180	-0.885	-0.873	-0.867	-0.862	0.434	0.452	0.460	0.468
16001	Ada County	ID	-2.484	-2.449	-2.433	-2.417	-1.454	-1.378	-1.343	-1.309	-1.326	-1.326	-1.326	-1.326	-1.000	-0.987	-0.982	-0.976	0.569	0.587	0.595	0.603
16005	Bannock County	ID	-0.793	-0.758	-0.742	-0.727	-1.888	-1.812	-1.777	-1.743	-0.143	-0.143	-0.143	-0.143	-0.135	-0.123	-0.117	-0.111	-1.809	-1.791	-1.783	-1.775
16017	Bonner County	ID	0.123	0.157	0.174	0.189	-0.489	-0.413	-0.378	-0.344	1.502	1.502	1.502	1.502	0.407	0.419	0.425	0.430	-0.540	-0.522	-0.513	-0.505
16019	Bonneville County	ID	-1.919	-1.885	-1.868	-1.853	-1.912	-1.836	-1.801	-1.767	-0.275	-0.275	-0.275	-0.275	-0.044	-0.032	-0.026	-0.021	-0.275	-0.257	-0.248	-0.240
16027	Canyon County	ID	0.053	0.088	0.104	0.120	0.151	0.227	0.262	0.296	-0.530	-0.530	-0.530	-0.530	-0.197	-0.185	-0.179	-0.174	-14.829	-14.811	-14.803	-14.795
16055	Kootenai County	ID	1.397	1.432	1.448	1.464	0.502	0.578	0.614	0.647	0.031	0.031	0.031	0.031	-0.635	-0.622	-0.616	-0.611	0.875	0.893	0.902	0.910
16057	Latah County	ID	1.016	1.051	1.067	1.083	0.130	0.206	0.242	0.275	0.342	0.342	0.342	0.342	-0.833	-0.820	-0.815	-0.809	0.902	0.920	0.929	0.937
16069	Nez Perce County	ID	0.781	0.816	0.832	0.847	1.033	1.109	1.144	1.178	0.398	0.398	0.398	0.398	0.407	0.420	0.425	0.431	0.073	0.091	0.099	0.107
16083	Twin Falls County	ID	0.045	0.079	0.096	0.111	0.146	0.222	0.258	0.291	-0.316	-0.316	-0.316	-0.316	-0.047	-0.035	-0.029	-0.023	0.023	0.041	0.049	0.057
17001	Adams County	IL	-0.620	-0.585	-0.569	-0.553	0.118	0.194	0.230	0.263	0.415	0.415	0.415	0.415	0.958	0.970	0.976	0.982	0.949	0.967	0.976	0.984
17019	Champaign County	IL	0.655	0.690	0.706	0.721	0.003	0.079	0.114	0.148	0.511	0.511	0.511	0.511	0.135	0.148	0.154	0.159	0.861	0.879	0.888	0.896
17031	Cook County	IL	-0.458	-0.424	-0.407	-0.392	-0.976	-0.900	-0.865	-0.831	0.117	0.117	0.117	0.117	0.224	0.236	0.242	0.248	0.545	0.563	0.571	0.579
17043	DuPage County	IL	0.316	0.351	0.367	0.383	0.336	0.412	0.447	0.481	0.416	0.416	0.416	0.416	0.478	0.490	0.496	0.502	0.493	0.511	0.519	0.527
17049	Effingham County	IL	-0.713	-0.678	-0.662	-0.646	1.334	1.410	1.445	1.479	0.537	0.537	0.537	0.537	0.523	0.535	0.541	0.547	0.885	0.903	0.911	0.919
17077	Jackson County	IL	0.123	0.157	0.174	0.189	0.024	0.100	0.135	0.169	0.026	0.026	0.026	0.026	0.326	0.339	0.344	0.350	0.770	0.789	0.797	0.805
17089	Kane County	IL	-0.125	-0.090	-0.074	-0.058	-0.803	-0.727	-0.692	-0.658	-0.151	-0.151	-0.151	-0.151	0.188	0.200	0.206	0.211	0.679	0.697	0.706	0.714

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
17097	Lake County	IL	1.196	1.231	1.247	1.263	1.050	1.126	1.161	1.195	-0.743	-0.743	-0.743	-0.743	0.875	0.888	0.893	0.899	0.655	0.673	0.682	0.690
17099	La Salle County	IL	-0.173	-0.138	-0.122	-0.106	-0.611	-0.535	-0.500	-0.466	-0.262	-0.262	-0.262	-0.262	1.507	1.520	1.525	1.531	-0.491	-0.473	-0.465	-0.457
17111	McHenry County	IL	1.532	1.567	1.583	1.598	0.728	0.804	0.839	0.873	0.107	0.107	0.107	0.107	1.401	1.413	1.419	1.424	0.143	0.161	0.170	0.178
17115	Macon County	IL	-0.425	-0.390	-0.374	-0.358	-0.195	-0.119	-0.083	-0.050	-0.379	-0.379	-0.379	-0.379	-0.382	-0.369	-0.364	-0.358	0.022	0.040	0.048	0.056
17117	Macoupin County	IL	-0.488	-0.453	-0.437	-0.421	-0.548	-0.473	-0.437	-0.403	-3.896	-3.896	-3.896	-3.896	2.119	2.132	2.137	2.143	0.837	0.855	0.864	0.872
17119	Madison County	IL	-0.053	-0.018	-0.002	0.013	-0.058	0.018	0.053	0.087	-0.433	-0.433	-0.433	-0.433	1.676	1.688	1.694	1.699	-1.063	-1.045	-1.036	-1.028
17143	Peoria County	IL	-0.186	-0.151	-0.135	-0.119	0.120	0.196	0.232	0.265	1.125	1.125	1.125	1.125	0.016	0.029	0.034	0.040	-0.580	-0.562	-0.554	-0.546
17157	Randolph County	IL	-0.462	-0.427	-0.411	-0.395	-1.058	-0.982	-0.947	-0.913	-1.471	-1.471	-1.471	-1.471	2.067	2.079	2.085	2.091	0.688	0.706	0.714	0.722
17161	Rock Island County	IL	-0.073	-0.039	-0.022	-0.007	0.058	0.133	0.169	0.203	-0.016	-0.016	-0.016	-0.016	0.958	0.970	0.976	0.981	0.754	0.772	0.780	0.788
17163	St. Clair County	IL	-0.591	-0.556	-0.540	-0.524	-0.314	-0.239	-0.203	-0.169	1.172	1.172	1.172	1.172	1.306	1.319	1.324	1.330	-0.555	-0.536	-0.528	-0.520
17167	Sangamon County	IL	0.277	0.312	0.328	0.344	0.571	0.647	0.682	0.716	-1.126	-1.126	-1.126	-1.126	-0.674	-0.662	-0.656	-0.651	0.325	0.343	0.351	0.360
17179	Tazewell County	IL	0.692	0.727	0.743	0.759	0.199	0.275	0.310	0.344	1.146	1.146	1.146	1.146	1.145	1.158	1.164	1.169	0.530	0.548	0.556	0.564
17197	Will County	IL	1.307	1.342	1.358	1.374	0.464	0.539	0.575	0.609	-0.485	-0.485	-0.485	-0.485	0.971	0.984	0.989	0.995	0.564	0.582	0.590	0.598
17201	Winnebago County	IL	-0.638	-0.603	-0.587	-0.572	-0.296	-0.220	-0.185	-0.151	-1.489	-1.489	-1.489	-1.489	-0.926	-0.914	-0.908	-0.903	0.623	0.641	0.649	0.657
18003	Allen County	IN	0.065	0.100	0.116	0.132	0.049	0.124	0.160	0.194	-0.374	-0.374	-0.374	-0.374	-0.276	-0.264	-0.258	-0.253	-1.435	-1.417	-1.409	-1.401
18011	Boone County	IN	1.509	1.543	1.560	1.575	0.930	1.006	1.041	1.075	-0.298	-0.298	-0.298	-0.298	1.161	1.173	1.179	1.184	0.463	0.481	0.490	0.498
18019	Clark County	IN	0.197	0.232	0.248	0.264	-0.737	-0.661	-0.626	-0.592	-2.555	-2.555	-2.555	-2.555	-0.153	-0.140	-0.134	-0.129	-1.433	-1.415	-1.406	-1.398
18027	Daviess County	IN	-0.088	-0.053	-0.037	-0.021	-1.501	-1.425	-1.390	-1.356	-0.419	-0.419	-0.419	-0.419	-0.201	-0.189	-0.183	-0.177	0.529	0.547	0.556	0.564
18035	Delaware County	IN	-0.963	-0.928	-0.912	-0.897	-0.498	-0.422	-0.387	-0.353	-0.018	-0.018	-0.018	-0.018	-0.107	-0.095	-0.089	-0.084	0.273	0.291	0.300	0.308
18037	Dubois County	IN	0.900	0.935	0.951	0.967	-0.156	-0.080	-0.045	-0.011	-0.429	-0.429	-0.429	-0.429	1.505	1.518	1.523	1.529	-0.944	-0.926	-0.918	-0.910
18039	Elkhart County	IN	-0.430	-0.395	-0.379	-0.363	-0.834	-0.758	-0.723	-0.689	-0.486	-0.486	-0.486	-0.486	-0.364	-0.352	-0.346	-0.340	-0.078	-0.060	-0.052	-0.043
18051	Gibson County	IN	0.114	0.149	0.165	0.180	-0.709	-0.633	-0.598	-0.564	-1.284	-1.284	-1.284	-1.284	1.718	1.731	1.737	1.742	0.380	0.398	0.406	0.414
18055	Greene County	IN	-0.488	-0.453	-0.437	-0.421	-1.210	-1.134	-1.099	-1.065	-1.065	-1.065	-1.065	-1.065	1.922	1.934	1.940	1.946	0.338	0.356	0.365	0.373
18057	Hamilton County	IN	2.089	2.124	2.140	2.156	1.754	1.830	1.866	1.899	0.502	0.502	0.502	0.502	0.679	0.692	0.697	0.703	0.338	0.356	0.365	0.373
18059	Hancock County	IN	1.243	1.278	1.294	1.310	0.446	0.521	0.557	0.591	0.809	0.809	0.809	0.809	1.357	1.369	1.375	1.380	0.356	0.374	0.383	0.391
18063	Hendricks County	IN	1.444	1.479	1.495	1.510	0.702	0.777	0.813	0.847	2.119	2.119	2.119	2.119	1.035	1.047	1.053	1.059	0.738	0.756	0.764	0.772
18065	Henry County	IN	-0.465	-0.430	-0.414	-0.399	-0.904	-0.828	-0.792	-0.759	1.012	1.012	1.012	1.012	-0.603	-0.591	-0.585	-0.579	-0.356	-0.338	-0.330	-0.322

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
18069	Huntington County	IN	1.138	1.151	1.157	1.162	0.868	0.886	0.895	0.903	1.138	1.151	1.157	1.162	0.868	0.886	0.895	0.903	1.138	1.151	1.157	1.162
18071	Jackson County	IN	-0.332	-0.320	-0.314	-0.308	0.463	0.481	0.490	0.498	-0.332	-0.320	-0.314	-0.308	0.463	0.481	0.490	0.498	-0.332	-0.320	-0.314	-0.308
18073	Jasper County	IN	1.269	1.281	1.287	1.292	0.874	0.892	0.900	0.908	1.269	1.281	1.287	1.292	0.874	0.892	0.900	0.908	1.269	1.281	1.287	1.292
18081	Johnson County	IN	0.050	0.062	0.068	0.074	0.522	0.540	0.549	0.557	0.050	0.062	0.068	0.074	0.522	0.540	0.549	0.557	0.050	0.062	0.068	0.074
18089	Lake County	IN	-0.547	-0.534	-0.529	-0.523	-1.174	-1.156	-1.147	-1.139	-0.547	-0.534	-0.529	-0.523	-1.174	-1.156	-1.147	-1.139	-0.547	-0.534	-0.529	-0.523
18091	LaPorte County	IN	-0.338	-0.325	-0.319	-0.314	0.521	0.539	0.548	0.556	-0.338	-0.325	-0.319	-0.314	0.521	0.539	0.548	0.556	-0.338	-0.325	-0.319	-0.314
18095	Madison County	IN	0.240	0.252	0.258	0.263	-0.492	-0.474	-0.466	-0.458	0.240	0.252	0.258	0.263	-0.492	-0.474	-0.466	-0.458	0.240	0.252	0.258	0.263
18097	Marion County	IN	-2.397	-2.385	-2.379	-2.373	-1.811	-1.793	-1.785	-1.777	-2.397	-2.385	-2.379	-2.373	-1.811	-1.793	-1.785	-1.777	-2.397	-2.385	-2.379	-2.373
18109	Morgan County	IN	0.934	0.946	0.952	0.958	0.150	0.168	0.177	0.185	0.934	0.946	0.952	0.958	0.150	0.168	0.177	0.185	0.934	0.946	0.952	0.958
18123	Perry County	IN	1.612	1.624	1.630	1.635	0.479	0.497	0.506	0.514	1.612	1.624	1.630	1.635	0.479	0.497	0.506	0.514	1.612	1.624	1.630	1.635
18127	Porter County	IN	0.455	0.468	0.473	0.479	-0.755	-0.737	-0.728	-0.720	0.455	0.468	0.473	0.479	-0.755	-0.737	-0.728	-0.720	0.455	0.468	0.473	0.479
18129	Posey County	IN	2.161	2.173	2.179	2.184	0.705	0.723	0.731	0.739	2.161	2.173	2.179	2.184	0.705	0.723	0.731	0.739	2.161	2.173	2.179	2.184
18141	St. Joseph County	IN	-1.142	-1.130	-1.124	-1.118	0.113	0.131	0.140	0.148	-1.142	-1.130	-1.124	-1.118	0.113	0.131	0.140	0.148	-1.142	-1.130	-1.124	-1.118
18145	Shelby County	IN	1.400	1.413	1.419	1.424	0.410	0.428	0.437	0.445	1.400	1.413	1.419	1.424	0.410	0.428	0.437	0.445	1.400	1.413	1.419	1.424
18157	Tippecanoe County	IN	-0.304	-0.291	-0.286	-0.280	-0.534	-0.516	-0.508	-0.500	-0.304	-0.291	-0.286	-0.280	-0.534	-0.516	-0.508	-0.500	-0.304	-0.291	-0.286	-0.280
18163	Vanderburgh County	IN	-0.503	-0.491	-0.485	-0.479	-0.853	-0.835	-0.827	-0.819	-0.503	-0.491	-0.485	-0.479	-0.853	-0.835	-0.827	-0.819	-0.503	-0.491	-0.485	-0.479
18167	Vigo County	IN	-1.173	-1.161	-1.155	-1.150	-1.538	-1.520	-1.512	-1.503	-1.173	-1.161	-1.155	-1.150	-1.538	-1.520	-1.512	-1.503	-1.173	-1.161	-1.155	-1.150
18173	Warrick County	IN	0.931	0.943	0.949	0.954	0.538	0.556	0.565	0.573	0.931	0.943	0.949	0.954	0.538	0.556	0.565	0.573	0.931	0.943	0.949	0.954
18177	Wayne County	IN	0.251	0.264	0.270	0.275	0.250	0.268	0.276	0.284	0.251	0.264	0.270	0.275	0.250	0.268	0.276	0.284	0.251	0.264	0.270	0.275
19013	Black Hawk County	IA	-0.004	0.009	0.014	0.020	0.181	0.199	0.207	0.215	-0.004	0.009	0.014	0.020	0.181	0.199	0.207	0.215	-0.004	0.009	0.014	0.020
19017	Bremer County	IA	1.497	1.509	1.515	1.520	0.855	0.873	0.882	0.890	1.497	1.509	1.515	1.520	0.855	0.873	0.882	0.890	1.497	1.509	1.515	1.520
19033	Cerro Gordo County	IA	0.937	0.949	0.955	0.960	0.631	0.649	0.657	0.665	0.937	0.949	0.955	0.960	0.631	0.649	0.657	0.665	0.937	0.949	0.955	0.960
19045	Clinton County	IA	0.430	0.442	0.448	0.454	-0.686	-0.668	-0.660	-0.652	0.430	0.442	0.448	0.454	-0.686	-0.668	-0.660	-0.652	0.430	0.442	0.448	0.454
19103	Johnson County	IA	0.430	0.443	0.448	0.454	-0.105	-0.087	-0.078	-0.070	0.430	0.443	0.448	0.454	-0.105	-0.087	-0.078	-0.070	0.430	0.443	0.448	0.454
19111	Lee County	IA	0.284	0.297	0.302	0.308	-0.402	-0.384	-0.375	-0.367	0.284	0.297	0.302	0.308	-0.402	-0.384	-0.375	-0.367	0.284	0.297	0.302	0.308
19113	Linn County	IA	0.040	0.053	0.059	0.064	-0.529	-0.511	-0.502	-0.494	0.040	0.053	0.059	0.064	-0.529	-0.511	-0.502	-0.494	0.040	0.053	0.059	0.064
19139	Muscatine County	IA	0.610	0.622	0.628	0.633	-0.623	-0.605	-0.596	-0.588	0.610	0.622	0.628	0.633	-0.623	-0.605	-0.596	-0.588	0.610	0.622	0.628	0.633

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
19153	Polk County	IA	0.824	0.859	0.875	0.890	0.905	0.980	1.016	1.050	0.586	0.586	0.586	0.586	-0.358	-0.345	-0.339	-0.334	-0.205	-0.187	-0.179	-0.171
19155	Pottawattamie County	IA	0.388	0.423	0.439	0.455	-0.277	-0.201	-0.166	-0.132	-0.112	-0.112	-0.112	-0.112	-1.316	-1.304	-1.298	-1.292	0.423	0.441	0.449	0.457
19163	Scott County	IA	0.469	0.504	0.520	0.535	0.848	0.923	0.959	0.992	0.234	0.234	0.234	0.234	-0.591	-0.579	-0.573	-0.568	-1.223	-1.205	-1.197	-1.188
19169	Story County	IA	0.081	0.116	0.132	0.147	1.825	1.901	1.936	1.970	0.497	0.497	0.497	0.497	0.193	0.206	0.212	0.217	0.919	0.937	0.946	0.954
19193	Woodbury County	IA	-0.018	0.017	0.033	0.049	-0.165	-0.089	-0.054	-0.020	-0.451	-0.451	-0.451	-0.451	0.168	0.180	0.186	0.191	0.137	0.155	0.163	0.171
20091	Johnson County	KS	1.720	1.755	1.771	1.787	1.906	1.982	2.017	2.051	0.894	0.894	0.894	0.894	0.348	0.361	0.366	0.372	0.712	0.730	0.738	0.747
20103	Leavenworth County	KS	0.788	0.823	0.839	0.854	0.021	0.097	0.132	0.166	0.950	0.950	0.950	0.950	-0.161	-0.149	-0.143	-0.137	0.890	0.908	0.917	0.925
20125	Montgomery County	KS	-0.226	-0.191	-0.175	-0.159	-0.925	-0.849	-0.814	-0.780	0.182	0.182	0.182	0.182	-0.189	-0.177	-0.171	-0.166	0.918	0.936	0.944	0.952
20173	Sedgwick County	KS	0.289	0.324	0.340	0.356	-0.189	-0.113	-0.077	-0.044	0.214	0.214	0.214	0.214	-1.412	-1.399	-1.394	-1.388	0.530	0.548	0.556	0.564
20177	Shawnee County	KS	0.164	0.199	0.215	0.231	0.321	0.396	0.432	0.466	-0.029	-0.029	-0.029	-0.029	-1.388	-1.376	-1.370	-1.365	0.598	0.616	0.624	0.632
20191	Sumner County	KS	0.194	0.229	0.245	0.261	-0.401	-0.326	-0.290	-0.256	-0.182	-0.182	-0.182	-0.182	0.251	0.264	0.269	0.275	0.581	0.599	0.607	0.615
20209	Wyandotte County	KS	-1.316	-1.281	-1.265	-1.250	-1.705	-1.629	-1.594	-1.560	-1.062	-1.062	-1.062	-1.062	-1.083	-1.071	-1.065	-1.060	-0.504	-0.486	-0.477	-0.469
21015	Boone County	KY	1.123	1.158	1.174	1.190	0.103	0.179	0.214	0.248	1.393	1.393	1.393	1.393	1.132	1.144	1.150	1.156	0.811	0.829	0.837	0.845
21029	Bullitt County	KY	0.185	0.220	0.236	0.252	-0.960	-0.884	-0.849	-0.815	-2.232	-2.232	-2.232	-2.232	0.989	1.001	1.007	1.012	0.027	0.045	0.053	0.061
21037	Campbell County	KY	0.074	0.108	0.125	0.140	-0.083	-0.007	0.028	0.062	-0.807	-0.807	-0.807	-0.807	0.049	0.062	0.067	0.073	-0.368	-0.350	-0.342	-0.334
21043	Carter County	KY	-1.897	-1.862	-1.846	-1.830	-2.457	-2.381	-2.346	-2.312	-0.825	-0.825	-0.825	-0.825	1.103	1.115	1.121	1.126	0.237	0.255	0.264	0.272
21059	Daviess County	KY	-0.364	-0.330	-0.313	-0.298	-0.381	-0.305	-0.270	-0.236	-0.391	-0.391	-0.391	-0.391	0.908	0.920	0.926	0.932	-0.409	-0.391	-0.383	-0.375
21067	Fayette County	KY	-0.040	-0.005	0.011	0.026	0.680	0.756	0.791	0.825	0.484	0.484	0.484	0.484	-0.854	-0.842	-0.836	-0.830	-0.209	-0.191	-0.183	-0.175
21089	Greenup County	KY	-0.898	-0.863	-0.847	-0.831	-1.028	-0.952	-0.916	-0.883	0.255	0.255	0.255	0.255	1.348	1.360	1.366	1.372	0.688	0.706	0.714	0.722
21093	Hardin County	KY	-0.071	-0.037	-0.020	-0.005	-0.451	-0.376	-0.340	-0.306	0.383	0.383	0.383	0.383	0.540	0.552	0.558	0.564	-0.051	-0.033	-0.024	-0.016
21111	Jefferson County	KY	-0.378	-0.343	-0.327	-0.312	0.129	0.204	0.240	0.274	-0.187	-0.187	-0.187	-0.187	-1.147	-1.134	-1.128	-1.123	-1.938	-1.920	-1.911	-1.903
21113	Jessamine County	KY	0.153	0.188	0.204	0.219	-0.097	-0.022	0.014	0.048	-0.917	-0.917	-0.917	-0.917	-0.283	-0.270	-0.265	-0.259	0.443	0.461	0.469	0.477
21151	Madison County	KY	-0.523	-0.489	-0.472	-0.457	-0.396	-0.320	-0.285	-0.251	1.084	1.084	1.084	1.084	-0.423	-0.410	-0.404	-0.399	0.025	0.043	0.052	0.060
21183	Ohio County	KY	-1.296	-1.261	-1.245	-1.229	-1.778	-1.702	-1.667	-1.633	-0.299	-0.299	-0.299	-0.299	1.890	1.902	1.908	1.913	0.145	0.163	0.172	0.180
21185	Oldham County	KY	1.619	1.653	1.670	1.685	1.128	1.203	1.239	1.273	1.057	1.057	1.057	1.057	1.107	1.120	1.126	1.131	0.379	0.397	0.406	0.414
21193	Perry County	KY	-2.577	-2.542	-2.526	-2.510	-2.390	-2.315	-2.279	-2.245	-0.843	-0.843	-0.843	-0.843	1.108	1.120	1.126	1.131	0.469	0.487	0.496	0.504
21195	Pike County	KY	-2.015	-1.980	-1.964	-1.949	-2.553	-2.478	-2.442	-2.408	-0.872	-0.872	-0.872	-0.872	1.217	1.229	1.235	1.241	0.149	0.167	0.176	0.184

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
21199	Pulaski County	KY	-1.664	-1.644	-1.634	-1.625	-1.169	-1.134	-1.118	-1.102	-1.081	-1.081	-1.081	-1.081	1.435	1.387	1.365	1.344	0.941	0.973	0.988	1.003
21213	Simpson County	KY	-0.492	-0.466	-0.453	-0.441	-1.038	-1.000	-0.983	-0.966	0.693	0.693	0.693	0.693	1.262	1.215	1.193	1.172	0.243	0.271	0.284	0.296
21221	Trigg County	KY	-0.619	-0.594	-0.582	-0.570	-0.715	-0.673	-0.653	-0.634	0.084	0.084	0.084	0.084	1.422	1.374	1.352	1.331	0.408	0.437	0.451	0.463
21227	Warren County	KY	-0.676	-0.650	-0.638	-0.627	0.009	0.063	0.088	0.113	0.540	0.540	0.540	0.540	-0.636	-0.675	-0.694	-0.711	-0.112	-0.086	-0.075	-0.063
22005	Ascension Parish	LA	0.817	0.850	0.866	0.881	-0.205	-0.155	-0.131	-0.108	1.985	1.985	1.985	1.985	0.094	0.052	0.032	0.013	0.971	1.003	1.018	1.033
22015	Bossier Parish	LA	-0.111	-0.083	-0.069	-0.057	-0.344	-0.296	-0.273	-0.251	1.281	1.281	1.281	1.281	-0.259	-0.300	-0.319	-0.337	-0.062	-0.036	-0.024	-0.013
22017	Caddo Parish	LA	-1.230	-1.208	-1.198	-1.187	-0.447	-0.401	-0.379	-0.358	0.968	0.968	0.968	0.968	-0.156	-0.197	-0.216	-0.235	0.377	0.405	0.419	0.431
22019	Calcasieu Parish	LA	-0.481	-0.454	-0.442	-0.430	-0.598	-0.554	-0.534	-0.514	0.963	0.963	0.963	0.963	0.398	0.354	0.334	0.315	-0.592	-0.569	-0.559	-0.549
22033	East Baton Rouge Parish	LA	-0.438	-0.411	-0.398	-0.386	0.606	0.670	0.699	0.728	0.996	0.996	0.996	0.996	-1.153	-1.190	-1.207	-1.224	-1.106	-1.087	-1.078	-1.070
22047	Iberville Parish	LA	-1.166	-1.143	-1.132	-1.122	-1.200	-1.165	-1.149	-1.134	-1.975	-1.975	-1.975	-1.975	2.286	2.235	2.211	2.188	0.059	0.085	0.097	0.109
22051	Jefferson Parish	LA	-0.236	-0.208	-0.195	-0.182	-0.364	-0.317	-0.294	-0.272	-0.163	-0.163	-0.163	-0.163	-0.315	-0.356	-0.374	-0.392	-0.198	-0.173	-0.161	-0.150
22055	Lafayette Parish	LA	-0.212	-0.184	-0.171	-0.159	0.164	0.220	0.246	0.272	2.214	2.214	2.214	2.214	-0.533	-0.573	-0.591	-0.609	0.543	0.573	0.587	0.600
22057	Lafourche Parish	LA	-0.192	-0.164	-0.151	-0.138	-1.091	-1.055	-1.038	-1.021	0.392	0.392	0.392	0.392	1.196	1.150	1.128	1.107	-0.103	-0.078	-0.066	-0.054
22063	Livingston Parish	LA	0.235	0.266	0.280	0.294	-0.809	-0.768	-0.749	-0.730	0.184	0.184	0.184	0.184	0.658	0.613	0.593	0.573	-0.272	-0.248	-0.237	-0.226
22071	Orleans Parish	LA	-1.304	-1.282	-1.272	-1.262	0.540	0.602	0.631	0.659	-0.139	-0.139	-0.139	-0.139	-1.069	-1.107	-1.124	-1.141	-0.067	-0.041	-0.029	-0.018
22073	Ouachita Parish	LA	-1.120	-1.097	-1.086	-1.076	-0.313	-0.264	-0.241	-0.219	0.545	0.545	0.545	0.545	-0.219	-0.260	-0.279	-0.297	1.086	1.119	1.134	1.149
22077	Pointe Coupee Parish	LA	-1.069	-1.045	-1.034	-1.024	-0.819	-0.778	-0.759	-0.741	0.160	0.160	0.160	0.160	2.269	2.219	2.195	2.172	1.009	1.042	1.057	1.072
22079	Rapides Parish	LA	-0.826	-0.802	-0.790	-0.779	-0.753	-0.711	-0.692	-0.673	0.818	0.818	0.818	0.818	0.419	0.376	0.356	0.336	0.336	0.364	0.377	0.390
22087	St. Bernard Parish	LA	-1.046	-1.023	-1.012	-1.002	-1.599	-1.571	-1.558	-1.545	-0.164	-0.164	-0.164	-0.164	1.476	1.428	1.406	1.385	-1.581	-1.565	-1.558	-1.551
22089	St. Charles Parish	LA	0.454	0.485	0.500	0.514	-0.390	-0.342	-0.320	-0.299	-0.330	-0.330	-0.330	-0.330	0.764	0.719	0.698	0.678	1.271	1.305	1.321	1.337
22095	St. John the Baptist	LA	-0.179	-0.151	-0.137	-0.125	-0.988	-0.950	-0.932	-0.915	-0.584	-0.584	-0.584	-0.584	1.290	1.243	1.221	1.200	1.187	1.220	1.236	1.251
22103	St. Tammany Parish	LA	0.554	0.586	0.601	0.615	0.429	0.489	0.518	0.545	1.430	1.430	1.430	1.430	-0.426	-0.466	-0.484	-0.502	-0.541	-0.518	-0.508	-0.497
22105	Tangipahoa Parish	LA	-1.102	-1.079	-1.068	-1.057	-0.754	-0.712	-0.693	-0.674	0.511	0.511	0.511	0.511	-0.211	-0.252	-0.271	-0.289	-0.365	-0.341	-0.330	-0.319
22109	Terrebonne Parish	LA	-0.153	-0.125	-0.112	-0.099	-1.316	-1.283	-1.268	-1.253	0.306	0.306	0.306	0.306	0.959	0.914	0.892	0.872	0.394	0.423	0.436	0.449
22121	West Baton Rouge	LA	-0.493	-0.466	-0.454	-0.442	-0.671	-0.628	-0.607	-0.588	1.610	1.610	1.610	1.610	1.410	1.362	1.340	1.319	-1.379	-1.362	-1.354	-1.346
22127	Winn Parish	LA	-1.747	-1.727	-1.718	-1.709	-1.374	-1.342	-1.328	-1.313	0.370	0.370	0.370	0.370	2.160	2.110	2.086	2.064	0.833	0.864	0.879	0.893
23003	Aroostook County	ME	-1.147	-1.124	-1.113	-1.103	-0.679	-0.636	-0.616	-0.596	-0.558	-0.558	-0.558	-0.558	1.543	1.495	1.473	1.451	0.664	0.695	0.709	0.723

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
23005	Cumberland County	ME	-1.976	-1.941	-1.925	-1.910	-1.226	-1.150	-1.115	-1.081	-0.741	-0.741	-0.741	-0.741	0.341	0.354	0.359	0.365	0.682	0.700	0.709	0.717
23009	Hancock County	ME	-0.451	-0.416	-0.400	-0.384	-0.979	-0.903	-0.868	-0.834	1.077	1.077	1.077	1.077	0.368	0.380	0.386	0.391	0.280	0.298	0.306	0.314
23011	Kennebec County	ME	-0.719	-0.684	-0.668	-0.652	-0.594	-0.519	-0.483	-0.449	0.816	0.816	0.816	0.816	1.332	1.344	1.350	1.355	0.381	0.399	0.407	0.415
23017	Oxford County	ME	-0.562	-0.527	-0.511	-0.496	-0.123	-0.047	-0.012	0.022	0.438	0.438	0.438	0.438	-0.489	-0.477	-0.471	-0.466	0.050	0.068	0.076	0.084
23019	Penobscot County	ME	0.974	1.009	1.025	1.041	-0.305	-0.229	-0.194	-0.160	2.296	2.296	2.296	2.296	0.028	0.040	0.046	0.052	0.698	0.716	0.725	0.733
23023	Sagadahoc County	ME	0.230	0.265	0.281	0.297	-0.462	-0.386	-0.351	-0.317	1.524	1.524	1.524	1.524	-0.763	-0.751	-0.745	-0.740	0.083	0.101	0.110	0.118
23031	York County	ME	-1.068	-1.033	-1.017	-1.002	-0.947	-0.872	-0.836	-0.802	1.118	1.118	1.118	1.118	-1.345	-1.333	-1.327	-1.321	0.362	0.380	0.388	0.396
24003	Anne Arundel County	MD	-0.107	-0.072	-0.056	-0.040	-0.975	-0.899	-0.863	-0.830	1.333	1.333	1.333	1.333	-0.294	-0.282	-0.276	-0.271	-0.297	-0.279	-0.271	-0.263
24005	Baltimore County	MD	-0.208	-0.173	-0.157	-0.141	-0.058	0.017	0.053	0.087	0.806	0.806	0.806	0.806	-1.786	-1.774	-1.768	-1.763	-0.727	-0.709	-0.701	-0.693
24013	Carroll County	MD	-1.291	-1.256	-1.240	-1.224	-1.554	-1.478	-1.442	-1.409	-1.368	-1.368	-1.368	-1.368	0.354	0.366	0.372	0.377	0.163	0.181	0.189	0.197
24015	Cecil County	MD	0.189	0.224	0.240	0.256	-0.568	-0.492	-0.457	-0.423	-0.199	-0.199	-0.199	-0.199	-1.102	-1.090	-1.084	-1.078	-0.009	0.009	0.017	0.025
24017	Charles County	MD	0.242	0.277	0.293	0.308	-0.106	-0.030	0.006	0.039	2.310	2.310	2.310	2.310	-1.135	-1.123	-1.117	-1.111	0.460	0.478	0.487	0.495
24021	Frederick County	MD	0.174	0.209	0.225	0.241	-0.994	-0.918	-0.883	-0.849	1.041	1.041	1.041	1.041	0.584	0.597	0.603	0.608	0.055	0.073	0.082	0.090
24023	Garrett County	MD	0.572	0.607	0.623	0.639	-1.010	-0.934	-0.898	-0.865	0.477	0.477	0.477	0.477	0.108	0.120	0.126	0.131	-0.062	-0.044	-0.035	-0.027
24025	Harford County	MD	-1.356	-1.321	-1.305	-1.289	-0.510	-0.434	-0.399	-0.365	-0.369	-0.369	-0.369	-0.369	-1.797	-1.784	-1.778	-1.773	0.080	0.098	0.106	0.114
24029	Kent County	MD	-1.044	-1.009	-0.993	-0.977	-0.677	-0.601	-0.566	-0.532	0.607	0.607	0.607	0.607	-1.776	-1.764	-1.758	-1.752	0.759	0.777	0.785	0.793
24031	Montgomery County	MD	-0.966	-0.932	-0.915	-0.900	-0.798	-0.722	-0.686	-0.653	0.937	0.937	0.937	0.937	1.481	1.494	1.500	1.505	0.719	0.737	0.745	0.753
24033	Prince George's County	MD	-0.523	-0.488	-0.472	-0.456	-1.000	-0.924	-0.889	-0.855	1.182	1.182	1.182	1.182	-1.117	-1.105	-1.099	-1.093	0.337	0.355	0.363	0.371
24043	Washington County	MD	-0.788	-0.753	-0.737	-0.721	-2.153	-2.077	-2.042	-2.008	0.215	0.215	0.215	0.215	-0.416	-0.404	-0.398	-0.393	-1.197	-1.179	-1.170	-1.162
24047	Worcester County	MD	0.642	0.677	0.693	0.709	-0.273	-0.197	-0.162	-0.128	0.048	0.048	0.048	0.048	0.381	0.394	0.399	0.405	0.853	0.871	0.880	0.888
24510	Baltimore city	MD	-0.099	-0.064	-0.048	-0.032	-1.278	-1.202	-1.167	-1.133	0.300	0.300	0.300	0.300	-0.194	-0.182	-0.176	-0.171	0.810	0.829	0.837	0.845
25001	Barnstable County	MA	0.871	0.906	0.922	0.938	0.170	0.246	0.281	0.315	1.450	1.450	1.450	1.450	0.293	0.305	0.311	0.317	-0.258	-0.240	-0.232	-0.224
25003	Berkshire County	MA	-1.108	-1.074	-1.057	-1.042	-1.442	-1.367	-1.331	-1.297	0.782	0.782	0.782	0.782	-3.282	-3.270	-3.264	-3.259	-0.128	-0.110	-0.101	-0.093
25005	Bristol County	MA	0.174	0.209	0.225	0.241	-1.522	-1.446	-1.411	-1.377	0.982	0.982	0.982	0.982	-0.777	-0.765	-0.759	-0.753	0.372	0.390	0.399	0.407
25009	Essex County	MA	-0.214	-0.179	-0.163	-0.147	-0.801	-0.725	-0.690	-0.656	2.243	2.243	2.243	2.243	0.043	0.056	0.061	0.067	-0.987	-0.969	-0.961	-0.953
25013	Hampden County	MA	-1.750	-1.715	-1.699	-1.683	-1.743	-1.667	-1.632	-1.598	1.357	1.357	1.357	1.357	0.916	0.929	0.935	0.940	0.624	0.642	0.650	0.658
25015	Hampshire County	MA	-1.020	-0.986	-0.969	-0.954	-0.267	-0.192	-0.156	-0.122	-0.009	-0.009	-0.009	-0.009	1.212	1.224	1.230	1.235	0.530	0.548	0.556	0.564

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
25017	Middlesex County	MA	1.515	1.550	1.566	1.582	1.738	1.814	1.849	1.883	0.003	0.003	0.003	0.003	0.397	0.409	0.415	0.421	0.712	0.730	0.738	0.747
25021	Norfolk County	MA	1.685	1.720	1.736	1.752	1.783	1.859	1.895	1.928	0.825	0.825	0.825	0.825	0.825	0.837	0.843	0.848	0.259	0.277	0.286	0.294
25023	Plymouth County	MA	1.232	1.267	1.283	1.299	0.888	0.963	0.999	1.033	0.218	0.218	0.218	0.218	0.551	0.563	0.569	0.575	0.253	0.271	0.279	0.287
25025	Suffolk County	MA	-0.266	-0.231	-0.215	-0.199	0.445	0.521	0.556	0.590	-0.665	-0.665	-0.665	-0.665	-1.375	-1.363	-1.357	-1.351	-1.174	-1.156	-1.147	-1.139
25027	Worcester County	MA	0.929	0.964	0.980	0.995	0.702	0.778	0.813	0.847	0.007	0.007	0.007	0.007	0.345	0.357	0.363	0.369	0.022	0.040	0.048	0.056
26005	Allegan County	MI	-0.163	-0.128	-0.112	-0.097	0.146	0.221	0.257	0.291	1.053	1.053	1.053	1.053	1.042	1.055	1.060	1.066	0.116	0.134	0.143	0.151
26017	Bay County	MI	-0.472	-0.437	-0.421	-0.405	0.064	0.139	0.175	0.209	0.051	0.051	0.051	0.051	0.621	0.634	0.640	0.645	0.076	0.094	0.102	0.110
26027	Cass County	MI	-0.370	-0.335	-0.319	-0.304	-0.516	-0.440	-0.404	-0.371	-0.349	-0.349	-0.349	-0.349	0.513	0.525	0.531	0.537	0.374	0.393	0.401	0.409
26033	Chippewa County	MI	-1.448	-1.413	-1.397	-1.382	-0.376	-0.300	-0.265	-0.231	0.105	0.105	0.105	0.105	0.737	0.750	0.756	0.761	-0.683	-0.665	-0.656	-0.648
26049	Genesee County	MI	-1.267	-1.232	-1.216	-1.200	-0.434	-0.358	-0.322	-0.289	-0.674	-0.674	-0.674	-0.674	-0.380	-0.368	-0.362	-0.356	0.195	0.213	0.221	0.229
26063	Huron County	MI	-0.946	-0.911	-0.895	-0.879	-0.250	-0.174	-0.139	-0.105	1.275	1.275	1.275	1.275	1.413	1.426	1.431	1.437	0.792	0.810	0.818	0.826
26065	Ingham County	MI	-0.779	-0.745	-0.728	-0.713	0.896	0.971	1.007	1.041	-0.613	-0.613	-0.613	-0.613	-0.252	-0.239	-0.233	-0.228	0.242	0.260	0.268	0.276
26077	Kalamazoo County	MI	-0.421	-0.386	-0.370	-0.354	0.892	0.968	1.003	1.037	-0.140	-0.140	-0.140	-0.140	-0.555	-0.543	-0.537	-0.532	0.077	0.095	0.103	0.111
26081	Kent County	MI	-0.245	-0.210	-0.194	-0.178	0.769	0.845	0.880	0.914	0.407	0.407	0.407	0.407	-0.151	-0.139	-0.133	-0.127	-0.300	-0.282	-0.274	-0.266
26089	Leelanau County	MI	0.526	0.561	0.577	0.592	2.058	2.134	2.169	2.203	-2.386	-2.386	-2.386	-2.386	1.648	1.660	1.666	1.671	0.776	0.794	0.803	0.811
26091	Lenawee County	MI	-0.662	-0.627	-0.611	-0.595	-0.097	-0.021	0.015	0.048	0.283	0.283	0.283	0.283	1.034	1.047	1.052	1.058	0.214	0.232	0.240	0.248
26099	Macomb County	MI	-0.003	0.031	0.048	0.063	0.215	0.291	0.326	0.360	-0.563	-0.563	-0.563	-0.563	0.490	0.503	0.508	0.514	0.017	0.035	0.043	0.051
26101	Manistee County	MI	-1.114	-1.080	-1.063	-1.048	0.068	0.144	0.179	0.213	-2.397	-2.397	-2.397	-2.397	0.941	0.953	0.959	0.965	0.526	0.544	0.552	0.560
26105	Mason County	MI	-1.067	-1.032	-1.016	-1.000	0.157	0.233	0.268	0.302	-1.017	-1.017	-1.017	-1.017	0.212	0.225	0.230	0.236	0.566	0.584	0.593	0.601
26115	Monroe County	MI	0.030	0.065	0.081	0.097	-0.203	-0.128	-0.092	-0.058	-1.462	-1.462	-1.462	-1.462	0.630	0.643	0.649	0.654	-0.268	-0.250	-0.242	-0.234
26121	Muskegon County	MI	-1.242	-1.208	-1.191	-1.176	-0.419	-0.343	-0.308	-0.274	-1.315	-1.315	-1.315	-1.315	-0.488	-0.475	-0.469	-0.464	-0.076	-0.058	-0.049	-0.041
26125	Oakland County	MI	0.749	0.783	0.800	0.815	1.492	1.568	1.603	1.637	-0.185	-0.185	-0.185	-0.185	0.392	0.404	0.410	0.416	0.187	0.205	0.214	0.222
26139	Ottawa County	MI	0.424	0.459	0.475	0.491	1.173	1.249	1.285	1.318	0.979	0.979	0.979	0.979	1.014	1.026	1.032	1.038	-0.253	-0.235	-0.227	-0.219
26147	St. Clair County	MI	-0.590	-0.555	-0.539	-0.524	-0.380	-0.305	-0.269	-0.235	0.380	0.380	0.380	0.380	0.553	0.565	0.571	0.577	0.169	0.187	0.195	0.203
26161	Washtenaw County	MI	0.307	0.342	0.358	0.374	1.738	1.814	1.849	1.883	0.339	0.339	0.339	0.339	-0.025	-0.012	-0.007	-0.001	0.202	0.220	0.228	0.236
26163	Wayne County	MI	-1.647	-1.612	-1.596	-1.581	-0.771	-0.695	-0.660	-0.626	-1.549	-1.549	-1.549	-1.549	-1.309	-1.296	-1.291	-1.285	-1.047	-1.029	-1.021	-1.013
27017	Carlton County	MN	-0.001	0.033	0.050	0.065	0.394	0.469	0.505	0.539	-0.293	-0.293	-0.293	-0.293	0.626	0.638	0.644	0.650	0.915	0.933	0.941	0.949

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
27021	Cass County	MN	-0.963	-0.928	-0.912	-0.896	0.437	0.513	0.548	0.582	1.085	1.085	1.085	1.085	1.438	1.451	1.456	1.462	0.840	0.858	0.867	0.875
27035	Crow Wing County	MN	-0.221	-0.186	-0.170	-0.154	0.816	0.892	0.927	0.961	1.709	1.709	1.709	1.709	1.014	1.026	1.032	1.037	0.438	0.456	0.464	0.473
27037	Dakota County	MN	1.520	1.554	1.571	1.586	1.697	1.773	1.809	1.842	0.973	0.973	0.973	0.973	0.507	0.520	0.525	0.531	0.133	0.151	0.160	0.168
27049	Goodhue County	MN	0.677	0.712	0.728	0.744	0.904	0.980	1.015	1.049	-2.264	-2.264	-2.264	-2.264	1.187	1.199	1.205	1.211	0.834	0.852	0.861	0.869
27053	Hennepin County	MN	0.755	0.790	0.806	0.822	1.840	1.916	1.952	1.985	0.188	0.188	0.188	0.188	-0.487	-0.475	-0.469	-0.464	-0.228	-0.210	-0.202	-0.194
27083	Lyon County	MN	0.259	0.294	0.310	0.325	0.752	0.828	0.863	0.897	1.140	1.140	1.140	1.140	0.758	0.770	0.776	0.781	0.070	0.088	0.097	0.105
27095	Mille Lacs County	MN	-0.654	-0.619	-0.603	-0.587	-0.338	-0.262	-0.227	-0.193	0.280	0.280	0.280	0.280	0.835	0.848	0.853	0.859	0.746	0.764	0.773	0.781
27109	Olmsted County	MN	1.241	1.276	1.292	1.307	1.740	1.816	1.851	1.885	0.888	0.888	0.888	0.888	0.581	0.593	0.599	0.604	-0.509	-0.491	-0.482	-0.474
27123	Ramsey County	MN	0.175	0.210	0.226	0.241	1.534	1.610	1.645	1.679	0.820	0.820	0.820	0.820	-0.506	-0.493	-0.488	-0.482	-0.063	-0.045	-0.036	-0.028
27137	St. Louis County	MN	-0.454	-0.419	-0.403	-0.387	0.887	0.962	0.998	1.032	0.055	0.055	0.055	0.055	0.211	0.223	0.229	0.234	0.202	0.220	0.228	0.236
27139	Scott County	MN	1.770	1.805	1.821	1.837	1.474	1.550	1.585	1.619	1.879	1.879	1.879	1.879	0.720	0.732	0.738	0.744	0.543	0.561	0.569	0.577
27145	Stearns County	MN	0.357	0.391	0.408	0.423	1.216	1.292	1.327	1.361	-0.459	-0.459	-0.459	-0.459	0.646	0.658	0.664	0.670	0.297	0.315	0.324	0.332
27163	Washington County	MN	1.717	1.751	1.768	1.783	1.762	1.838	1.873	1.907	0.879	0.879	0.879	0.879	0.579	0.592	0.598	0.603	0.791	0.809	0.817	0.825
27169	Winona County	MN	-0.091	-0.056	-0.040	-0.024	1.030	1.106	1.142	1.175	0.422	0.422	0.422	0.422	1.263	1.276	1.281	1.287	0.415	0.433	0.442	0.450
27171	Wright County	MN	1.095	1.129	1.146	1.161	1.068	1.144	1.179	1.213	1.389	1.389	1.389	1.389	1.004	1.016	1.022	1.027	0.085	0.103	0.112	0.120
28001	Adams County	MS	-2.359	-2.324	-2.308	-2.293	-0.915	-0.839	-0.804	-0.770	-1.037	-1.037	-1.037	-1.037	-0.639	-0.626	-0.620	-0.615	0.415	0.433	0.441	0.449
28035	Forrest County	MS	-1.741	-1.706	-1.690	-1.674	-1.183	-1.108	-1.072	-1.038	0.675	0.675	0.675	0.675	-0.586	-0.573	-0.567	-0.562	-0.766	-0.748	-0.740	-0.732
28047	Harrison County	MS	-0.455	-0.420	-0.404	-0.389	-1.381	-1.305	-1.270	-1.236	0.305	0.305	0.305	0.305	-0.564	-0.552	-0.546	-0.540	-0.396	-0.378	-0.369	-0.361
28049	Hinds County	MS	-1.396	-1.361	-1.345	-1.330	-0.473	-0.398	-0.362	-0.328	-0.374	-0.374	-0.374	-0.374	-2.069	-2.057	-2.051	-2.046	-0.380	-0.362	-0.353	-0.345
28059	Jackson County	MS	0.005	0.039	0.056	0.071	-1.018	-0.942	-0.907	-0.873	-0.429	-0.429	-0.429	-0.429	-0.320	-0.307	-0.302	-0.296	-0.567	-0.549	-0.540	-0.532
28067	Jones County	MS	-1.358	-1.323	-1.307	-1.291	-1.189	-1.113	-1.078	-1.044	1.221	1.221	1.221	1.221	-0.124	-0.112	-0.106	-0.100	-1.010	-0.992	-0.983	-0.975
28075	Lauderdale County	MS	-1.442	-1.407	-1.391	-1.375	-1.346	-1.271	-1.235	-1.201	-0.081	-0.081	-0.081	-0.081	-0.195	-0.183	-0.177	-0.172	-0.424	-0.406	-0.398	-0.390
28087	Lowndes County	MS	-1.794	-1.759	-1.743	-1.727	-0.629	-0.553	-0.517	-0.484	-0.293	-0.293	-0.293	-0.293	0.376	0.389	0.394	0.400	-0.488	-0.470	-0.462	-0.454
29037	Cass County	MO	0.884	0.919	0.935	0.951	0.093	0.169	0.204	0.238	1.996	1.996	1.996	1.996	0.809	0.821	0.827	0.833	0.505	0.523	0.532	0.540
29047	Clay County	MO	0.889	0.924	0.940	0.956	0.649	0.724	0.760	0.794	-0.342	-0.342	-0.342	-0.342	-0.802	-0.789	-0.783	-0.778	-0.084	-0.066	-0.058	-0.050
29049	Clinton County	MO	0.273	0.308	0.324	0.340	-0.295	-0.220	-0.184	-0.150	-1.281	-1.281	-1.281	-1.281	1.355	1.367	1.373	1.378	0.709	0.727	0.736	0.744
29077	Greene County	MO	-0.312	-0.277	-0.261	-0.245	0.455	0.531	0.566	0.600	-0.536	-0.536	-0.536	-0.536	-1.891	-1.878	-1.873	-1.867	-0.620	-0.602	-0.593	-0.585

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
29095	Jackson County	MO	-0.373	-0.338	-0.322	-0.307	-1.175	-1.099	-1.064	-1.030	-0.495	-0.495	-0.495	-0.495	-2.415	-2.403	-2.397	-2.392	-0.941	-0.923	-0.915	-0.907
29097	Jasper County	MO	-0.808	-0.773	-0.757	-0.742	-0.861	-0.786	-0.750	-0.716	-0.272	-0.272	-0.272	-0.272	-1.192	-1.179	-1.174	-1.168	0.852	0.870	0.879	0.887
29099	Jefferson County	MO	0.529	0.563	0.580	0.595	-0.546	-0.470	-0.435	-0.401	0.062	0.062	0.062	0.062	0.404	0.416	0.422	0.427	-1.711	-1.693	-1.684	-1.676
29113	Lincoln County	MO	0.072	0.106	0.123	0.138	-1.165	-1.089	-1.054	-1.020	-5.171	-5.171	-5.171	-5.171	1.143	1.155	1.161	1.167	0.569	0.587	0.596	0.604
29157	Perry County	MO	-0.074	-0.039	-0.023	-0.007	-0.656	-0.580	-0.544	-0.511	-0.197	-0.197	-0.197	-0.197	1.403	1.416	1.421	1.427	0.452	0.470	0.478	0.486
29163	Pike County	MO	-0.809	-0.774	-0.758	-0.742	-1.318	-1.242	-1.206	-1.173	-0.612	-0.612	-0.612	-0.612	1.313	1.325	1.331	1.337	0.806	0.824	0.832	0.840
29183	St. Charles County	MO	1.437	1.471	1.488	1.503	1.230	1.306	1.342	1.375	0.514	0.514	0.514	0.514	0.611	0.623	0.629	0.634	0.435	0.453	0.462	0.470
29186	Ste. Genevieve County	MO	0.248	0.283	0.299	0.315	-0.692	-0.616	-0.581	-0.547	-6.734	-6.734	-6.734	-6.734	1.609	1.622	1.627	1.633	0.325	0.343	0.351	0.360
29189	St. Louis County	MO	0.601	0.636	0.652	0.668	1.253	1.329	1.364	1.398	-0.414	-0.414	-0.414	-0.414	-0.290	-0.277	-0.272	-0.266	-1.126	-1.108	-1.099	-1.091
29207	Stoddard County	MO	-1.296	-1.261	-1.245	-1.230	-1.428	-1.352	-1.317	-1.283	-5.585	-5.585	-5.585	-5.585	1.122	1.134	1.140	1.145	0.013	0.031	0.040	0.048
29510	St. Louis city	MO	-1.942	-1.907	-1.891	-1.875	-0.645	-0.569	-0.534	-0.500	-2.099	-2.099	-2.099	-2.099	-4.801	-4.789	-4.783	-4.778	-1.981	-1.963	-1.955	-1.947
30013	Cascade County	MT	-0.089	-0.054	-0.038	-0.022	0.060	0.136	0.171	0.205	-0.247	-0.247	-0.247	-0.247	-0.401	-0.389	-0.383	-0.377	0.806	0.824	0.832	0.841
30029	Flathead County	MT	-0.221	-0.186	-0.170	-0.155	0.552	0.628	0.663	0.697	0.063	0.063	0.063	0.063	-0.337	-0.325	-0.319	-0.313	0.202	0.220	0.228	0.236
30031	Gallatin County	MT	0.658	0.693	0.709	0.725	1.648	1.724	1.759	1.793	0.338	0.338	0.338	0.338	0.223	0.236	0.241	0.247	0.598	0.616	0.624	0.632
30047	Lake County	MT	-1.359	-1.324	-1.308	-1.292	0.415	0.491	0.527	0.560	0.058	0.058	0.058	0.058	0.507	0.519	0.525	0.531	0.917	0.935	0.944	0.952
30049	Lewis and Clark County	MT	0.529	0.564	0.580	0.595	1.078	1.153	1.189	1.223	0.281	0.281	0.281	0.281	0.452	0.464	0.470	0.475	0.637	0.655	0.664	0.672
30063	Missoula County	MT	-0.375	-0.340	-0.324	-0.308	1.258	1.334	1.369	1.403	0.378	0.378	0.378	0.378	-0.003	0.010	0.015	0.021	0.520	0.538	0.547	0.555
30081	Ravalli County	MT	-0.330	-0.295	-0.279	-0.263	0.775	0.851	0.887	0.920	0.735	0.735	0.735	0.735	1.182	1.195	1.201	1.206	0.495	0.513	0.521	0.529
30111	Yellowstone County	MT	0.545	0.580	0.596	0.612	0.595	0.671	0.706	0.740	-0.202	-0.202	-0.202	-0.202	-0.221	-0.209	-0.203	-0.198	-0.194	-0.176	-0.168	-0.160
31025	Cass County	NE	1.300	1.335	1.351	1.367	0.367	0.442	0.478	0.511	-0.059	-0.059	-0.059	-0.059	0.950	0.963	0.969	0.974	0.675	0.693	0.701	0.709
31047	Dawson County	NE	0.054	0.088	0.105	0.120	-1.103	-1.027	-0.992	-0.958	-0.423	-0.423	-0.423	-0.423	0.255	0.268	0.273	0.279	0.863	0.881	0.889	0.897
31055	Douglas County	NE	0.521	0.556	0.572	0.588	0.583	0.658	0.694	0.728	0.169	0.169	0.169	0.169	-0.943	-0.930	-0.924	-0.919	-4.532	-4.514	-4.506	-4.498
31079	Hall County	NE	0.338	0.372	0.389	0.404	-0.692	-0.616	-0.581	-0.547	-0.316	-0.316	-0.316	-0.316	-0.762	-0.749	-0.743	-0.738	0.474	0.492	0.500	0.509
31109	Lancaster County	NE	0.742	0.777	0.793	0.809	1.013	1.089	1.124	1.158	0.559	0.559	0.559	0.559	-0.692	-0.680	-0.674	-0.669	0.799	0.817	0.825	0.833
31153	Sarpy County	NE	1.532	1.567	1.583	1.598	0.852	0.928	0.963	0.997	0.677	0.677	0.677	0.677	0.590	0.602	0.608	0.613	0.204	0.222	0.231	0.239
31157	Scotts Bluff County	NE	-0.074	-0.039	-0.023	-0.007	-0.388	-0.312	-0.277	-0.243	-0.787	-0.787	-0.787	-0.787	-0.073	-0.061	-0.055	-0.050	0.632	0.650	0.659	0.667
31177	Washington County	NE	1.378	1.413	1.429	1.445	0.835	0.911	0.947	0.980	1.087	1.087	1.087	1.087	1.392	1.404	1.410	1.415	0.474	0.492	0.501	0.509

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
32003	Clark County	NV	0.201	0.236	0.252	0.267	-0.801	-0.725	-0.690	-0.656	-0.692	-0.692	-0.692	-0.692	-1.008	-0.996	-0.990	-0.985	-1.411	-1.393	-1.385	-1.377
32005	Douglas County	NV	0.448	0.483	0.499	0.515	1.302	1.377	1.413	1.447	0.585	0.585	0.585	0.585	1.295	1.308	1.314	1.319	0.957	0.975	0.983	0.991
32019	Lyon County	NV	-0.604	-0.569	-0.553	-0.538	-0.946	-0.870	-0.835	-0.801	-0.225	-0.225	-0.225	-0.225	0.982	0.994	1.000	1.006	0.649	0.667	0.676	0.684
32023	Nye County	NV	-1.283	-1.248	-1.232	-1.216	-1.662	-1.586	-1.551	-1.517	-1.774	-1.774	-1.774	-1.774	0.719	0.731	0.737	0.742	0.811	0.829	0.838	0.846
32031	Washoe County	NV	0.106	0.141	0.157	0.173	0.120	0.195	0.231	0.265	-0.196	-0.196	-0.196	-0.196	-0.624	-0.611	-0.606	-0.600	0.173	0.191	0.199	0.207
32510	Carson City	NV	-0.097	-0.062	-0.046	-0.030	-0.421	-0.345	-0.309	-0.276	-0.540	-0.540	-0.540	-0.540	0.332	0.344	0.350	0.356	0.708	0.726	0.734	0.742
33001	Belknap County	NH	0.679	0.714	0.730	0.745	0.903	0.979	1.014	1.048	-0.014	-0.014	-0.014	-0.014	0.412	0.424	0.430	0.436	0.802	0.820	0.829	0.837
33005	Cheshire County	NH	0.687	0.722	0.738	0.754	1.096	1.172	1.208	1.241	0.287	0.287	0.287	0.287	1.144	1.156	1.162	1.168	0.278	0.296	0.304	0.313
33007	Coos County	NH	-0.213	-0.178	-0.162	-0.147	-0.218	-0.142	-0.106	-0.073	-1.058	-1.058	-1.058	-1.058	1.374	1.387	1.392	1.398	0.371	0.389	0.398	0.406
33009	Grafton County	NH	0.734	0.769	0.785	0.801	1.609	1.685	1.720	1.754	0.473	0.473	0.473	0.473	0.798	0.810	0.816	0.821	0.786	0.804	0.812	0.820
33011	Hillsborough County	NH	1.416	1.451	1.467	1.483	1.088	1.164	1.199	1.233	0.280	0.280	0.280	0.280	0.514	0.526	0.532	0.538	0.389	0.407	0.415	0.424
33013	Merrimack County	NH	1.218	1.253	1.269	1.285	1.166	1.242	1.278	1.311	0.130	0.130	0.130	0.130	1.042	1.054	1.060	1.066	-0.240	-0.221	-0.213	-0.205
33015	Rockingham County	NH	1.701	1.735	1.752	1.767	1.453	1.529	1.564	1.598	0.400	0.400	0.400	0.400	1.119	1.132	1.138	1.143	0.606	0.624	0.632	0.640
34001	Atlantic County	NJ	0.041	0.075	0.092	0.107	-0.231	-0.155	-0.120	-0.086	-0.192	-0.192	-0.192	-0.192	-0.426	-0.413	-0.407	-0.402	0.092	0.110	0.119	0.127
34003	Bergen County	NJ	1.806	1.840	1.857	1.872	1.612	1.688	1.723	1.757	0.173	0.173	0.173	0.173	0.824	0.837	0.842	0.848	-1.174	-1.156	-1.147	-1.139
34005	Burlington County	NJ	1.580	1.615	1.631	1.646	0.940	1.016	1.052	1.085	0.844	0.844	0.844	0.844	0.765	0.777	0.783	0.788	0.942	0.960	0.969	0.977
34007	Camden County	NJ	0.504	0.539	0.555	0.571	0.106	0.182	0.217	0.251	-0.074	-0.074	-0.074	-0.074	-0.573	-0.561	-0.555	-0.550	-0.344	-0.326	-0.318	-0.310
34011	Cumberland County	NJ	-0.433	-0.398	-0.382	-0.367	-1.522	-1.446	-1.411	-1.377	-0.028	-0.028	-0.028	-0.028	-0.604	-0.592	-0.586	-0.581	-0.225	-0.207	-0.198	-0.190
34013	Essex County	NJ	-0.067	-0.032	-0.016	-0.001	-0.032	0.044	0.079	0.113	-0.564	-0.564	-0.564	-0.564	-0.612	-0.600	-0.594	-0.588	0.636	0.654	0.663	0.671
34015	Gloucester County	NJ	1.222	1.257	1.273	1.288	0.301	0.377	0.413	0.446	0.457	0.457	0.457	0.457	0.147	0.159	0.165	0.171	0.259	0.277	0.286	0.294
34019	Hunterdon County	NJ	2.481	2.516	2.532	2.548	1.977	2.053	2.088	2.122	0.970	0.970	0.970	0.970	1.316	1.329	1.334	1.340	-0.020	-0.002	0.006	0.014
34021	Mercer County	NJ	1.226	1.261	1.277	1.293	0.727	0.803	0.838	0.872	-0.008	-0.008	-0.008	-0.008	0.128	0.140	0.146	0.151	-0.217	-0.199	-0.190	-0.182
34023	Middlesex County	NJ	1.461	1.496	1.512	1.528	0.918	0.994	1.029	1.063	0.135	0.135	0.135	0.135	0.291	0.303	0.309	0.314	-0.128	-0.110	-0.101	-0.093
34025	Monmouth County	NJ	1.705	1.740	1.756	1.771	1.199	1.275	1.310	1.344	0.214	0.214	0.214	0.214	0.450	0.462	0.468	0.474	0.664	0.682	0.690	0.698
34027	Morris County	NJ	2.367	2.402	2.418	2.433	1.810	1.886	1.921	1.955	0.928	0.928	0.928	0.928	1.044	1.056	1.062	1.067	0.389	0.407	0.415	0.424
34029	Ocean County	NJ	0.647	0.681	0.698	0.713	0.499	0.575	0.610	0.644	0.333	0.333	0.333	0.333	0.751	0.763	0.769	0.774	-0.051	-0.033	-0.025	-0.017
34031	Passaic County	NJ	0.014	0.049	0.065	0.080	-0.014	0.062	0.097	0.131	-0.405	-0.405	-0.405	-0.405	0.024	0.036	0.042	0.048	0.285	0.303	0.311	0.319

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
34039	Union County	NJ	0.922	0.957	0.973	0.988	0.522	0.597	0.633	0.666	-0.436	-0.436	-0.436	-0.436	-0.102	-0.090	-0.084	-0.078	-1.126	-1.108	-1.099	-1.091
34041	Warren County	NJ	1.429	1.463	1.480	1.495	0.479	0.555	0.590	0.624	0.317	0.317	0.317	0.317	0.922	0.934	0.940	0.945	-0.225	-0.207	-0.198	-0.190
35001	Bernalillo County	NM	0.010	0.045	0.061	0.076	0.405	0.481	0.516	0.550	-0.157	-0.157	-0.157	-0.157	-2.004	-1.992	-1.986	-1.981	-1.206	-1.188	-1.180	-1.172
35005	Chaves County	NM	-1.178	-1.144	-1.127	-1.112	-1.229	-1.153	-1.118	-1.084	-1.136	-1.136	-1.136	-1.136	-1.691	-1.679	-1.673	-1.667	0.804	0.822	0.830	0.838
35013	Dona Ana County	NM	-1.328	-1.294	-1.277	-1.262	-0.294	-0.218	-0.183	-0.149	-0.926	-0.926	-0.926	-0.926	-0.525	-0.512	-0.506	-0.501	-1.538	-1.520	-1.512	-1.503
35015	Eddy County	NM	0.002	0.037	0.053	0.068	-0.920	-0.844	-0.808	-0.775	0.306	0.306	0.306	0.306	-0.715	-0.703	-0.697	-0.692	0.362	0.380	0.388	0.396
35017	Grant County	NM	-1.001	-0.966	-0.950	-0.934	0.024	0.100	0.135	0.169	-0.449	-0.449	-0.449	-0.449	0.408	0.420	0.426	0.432	0.890	0.908	0.917	0.925
35025	Lea County	NM	0.111	0.146	0.162	0.178	-1.708	-1.632	-1.597	-1.563	0.254	0.254	0.254	0.254	-0.941	-0.928	-0.923	-0.917	0.553	0.571	0.579	0.588
35027	Lincoln County	NM	-0.168	-0.134	-0.117	-0.102	0.465	0.541	0.576	0.610	-0.564	-0.564	-0.564	-0.564	0.237	0.249	0.255	0.260	0.864	0.882	0.890	0.898
35029	Luna County	NM	-3.580	-3.545	-3.529	-3.513	-1.794	-1.719	-1.683	-1.649	-0.778	-0.778	-0.778	-0.778	-0.071	-0.059	-0.053	-0.047	0.504	0.522	0.530	0.538
35039	Rio Arriba County	NM	-0.809	-0.774	-0.758	-0.742	-1.157	-1.082	-1.046	-1.012	-0.176	-0.176	-0.176	-0.176	0.921	0.934	0.939	0.945	0.957	0.975	0.983	0.991
35043	Sandoval County	NM	0.489	0.524	0.540	0.556	0.504	0.580	0.616	0.649	0.762	0.762	0.762	0.762	0.516	0.528	0.534	0.539	-0.454	-0.436	-0.427	-0.419
35045	San Juan County	NM	0.024	0.059	0.075	0.090	-0.970	-0.894	-0.859	-0.825	-0.600	-0.600	-0.600	-0.600	0.110	0.123	0.128	0.134	0.202	0.220	0.228	0.236
35049	Santa Fe County	NM	0.586	0.621	0.637	0.653	1.471	1.547	1.583	1.616	-0.101	-0.101	-0.101	-0.101	-0.670	-0.657	-0.651	-0.646	0.760	0.778	0.786	0.794
35061	Valencia County	NM	-0.401	-0.366	-0.350	-0.334	-0.982	-0.906	-0.871	-0.837	-0.975	-0.975	-0.975	-0.975	-0.248	-0.235	-0.229	-0.224	0.890	0.908	0.917	0.925
36001	Albany County	NY	0.554	0.589	0.605	0.621	0.928	1.004	1.039	1.073	-0.449	-0.449	-0.449	-0.449	-0.257	-0.245	-0.239	-0.234	0.011	0.029	0.038	0.046
36005	Bronx County	NY	-2.203	-2.168	-2.152	-2.136	-1.488	-1.413	-1.377	-1.343	-0.697	-0.697	-0.697	-0.697	1.370	1.382	1.388	1.394	-1.206	-1.188	-1.180	-1.172
36013	Chautauqua County	NY	-0.785	-0.750	-0.734	-0.718	-0.217	-0.141	-0.106	-0.072	0.287	0.287	0.287	0.287	0.414	0.426	0.432	0.438	0.443	0.461	0.469	0.477
36015	Chemung County	NY	-0.568	-0.533	-0.517	-0.501	-0.245	-0.169	-0.133	-0.100	-2.495	-2.495	-2.495	-2.495	0.416	0.428	0.434	0.439	0.852	0.870	0.879	0.887
36027	Dutchess County	NY	1.096	1.131	1.147	1.162	0.772	0.847	0.883	0.917	-0.826	-0.826	-0.826	-0.826	0.533	0.546	0.552	0.557	0.750	0.768	0.776	0.785
36029	Erie County	NY	-0.084	-0.049	-0.033	-0.017	0.453	0.529	0.564	0.598	-0.377	-0.377	-0.377	-0.377	-0.225	-0.213	-0.207	-0.201	-0.912	-0.894	-0.885	-0.877
36031	Essex County	NY	-0.393	-0.358	-0.342	-0.327	0.310	0.386	0.421	0.455	0.827	0.827	0.827	0.827	1.277	1.289	1.295	1.301	0.530	0.548	0.556	0.564
36033	Franklin County	NY	-0.859	-0.824	-0.808	-0.793	-0.926	-0.850	-0.815	-0.781	0.077	0.077	0.077	0.077	0.497	0.510	0.516	0.521	0.806	0.824	0.833	0.841
36043	Herkimer County	NY	-0.575	-0.540	-0.524	-0.509	-0.259	-0.184	-0.148	-0.114	0.045	0.045	0.045	0.045	0.820	0.833	0.838	0.844	0.883	0.901	0.909	0.917
36045	Jefferson County	NY	-0.541	-0.506	-0.490	-0.474	-0.711	-0.636	-0.600	-0.566	2.293	2.293	2.293	2.293	0.488	0.500	0.506	0.511	0.787	0.805	0.814	0.822
36047	Kings County	NY	-0.973	-0.938	-0.922	-0.906	-0.204	-0.128	-0.093	-0.059	-1.826	-1.826	-1.826	-1.826	-3.204	-3.191	-3.186	-3.180	-0.529	-0.511	-0.502	-0.494
36053	Madison County	NY	0.053	0.088	0.104	0.119	0.024	0.100	0.135	0.169	1.220	1.220	1.220	1.220	0.766	0.778	0.784	0.789	0.791	0.809	0.817	0.825

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
36055	Monroe County	NY	0.118	0.153	0.169	0.185	0.943	1.019	1.055	1.088	-0.836	-0.836	-0.836	-0.836	-0.109	-0.097	-0.091	-0.085	0.153	0.171	0.179	0.188
36059	Nassau County	NY	2.094	2.129	2.145	2.161	1.523	1.598	1.634	1.668	-0.472	-0.472	-0.472	-0.472	0.900	0.912	0.918	0.923	-0.262	-0.244	-0.236	-0.228
36061	New York County	NY	0.500	0.535	0.551	0.567	1.575	1.651	1.686	1.720	-1.281	-1.281	-1.281	-1.281	1.336	1.348	1.354	1.359	-1.981	-1.963	-1.955	-1.947
36063	Niagara County	NY	-0.271	-0.236	-0.220	-0.204	-0.168	-0.093	-0.057	-0.023	-0.350	-0.350	-0.350	-0.350	0.059	0.071	0.077	0.083	-0.150	-0.132	-0.123	-0.115
36065	Oneida County	NY	-0.227	-0.192	-0.176	-0.160	-0.193	-0.117	-0.082	-0.048	-0.652	-0.652	-0.652	-0.652	0.024	0.036	0.042	0.047	-0.052	-0.034	-0.026	-0.017
36067	Onondaga County	NY	0.228	0.263	0.279	0.295	0.743	0.819	0.854	0.888	-0.277	-0.277	-0.277	-0.277	0.173	0.186	0.191	0.197	0.720	0.738	0.746	0.755
36071	Orange County	NY	1.018	1.053	1.069	1.084	0.195	0.270	0.306	0.340	0.354	0.354	0.354	0.354	0.301	0.314	0.319	0.325	0.063	0.081	0.089	0.097
36075	Oswego County	NY	-0.761	-0.727	-0.710	-0.695	-0.733	-0.657	-0.622	-0.588	0.773	0.773	0.773	0.773	0.786	0.798	0.804	0.809	0.711	0.729	0.738	0.746
36079	Putnam County	NY	2.013	2.047	2.064	2.079	1.326	1.402	1.437	1.471	0.125	0.125	0.125	0.125	1.235	1.248	1.253	1.259	0.760	0.778	0.786	0.794
36081	Queens County	NY	0.425	0.460	0.476	0.492	0.034	0.110	0.145	0.179	-1.930	-1.930	-1.930	-1.930	1.252	1.265	1.270	1.276	-0.783	-0.765	-0.756	-0.748
36083	Rensselaer County	NY	0.484	0.519	0.535	0.550	0.415	0.491	0.526	0.560	-1.689	-1.689	-1.689	-1.689	0.136	0.149	0.155	0.160	0.814	0.832	0.840	0.848
36089	St. Lawrence County	NY	-0.958	-0.923	-0.907	-0.892	-0.740	-0.664	-0.628	-0.595	-0.831	-0.831	-0.831	-0.831	0.635	0.647	0.653	0.658	0.897	0.915	0.923	0.931
36091	Saratoga County	NY	1.125	1.160	1.176	1.192	1.316	1.391	1.427	1.461	0.882	0.882	0.882	0.882	1.087	1.099	1.105	1.111	0.782	0.800	0.809	0.817
36093	Schenectady County	NY	0.363	0.398	0.414	0.430	0.517	0.593	0.628	0.662	1.251	1.251	1.251	1.251	-0.232	-0.220	-0.214	-0.209	0.890	0.908	0.917	0.925
36101	Steuben County	NY	-0.367	-0.332	-0.316	-0.301	-0.192	-0.116	-0.080	-0.047	-1.719	-1.719	-1.719	-1.719	1.062	1.074	1.080	1.085	0.269	0.287	0.295	0.303
36103	Suffolk County	NY	1.773	1.807	1.824	1.839	0.759	0.835	0.871	0.904	-0.213	-0.213	-0.213	-0.213	0.492	0.505	0.510	0.516	0.231	0.249	0.257	0.265
36111	Ulster County	NY	0.295	0.329	0.346	0.361	0.720	0.795	0.831	0.865	0.069	0.069	0.069	0.069	0.802	0.815	0.821	0.826	0.845	0.863	0.871	0.879
36117	Wayne County	NY	0.401	0.436	0.452	0.468	-0.066	0.010	0.045	0.079	0.836	0.836	0.836	0.836	0.767	0.779	0.785	0.791	0.672	0.690	0.699	0.707
36119	Westchester County	NY	1.456	1.491	1.507	1.523	1.446	1.521	1.557	1.591	0.300	0.300	0.300	0.300	0.632	0.645	0.651	0.656	0.103	0.121	0.130	0.138
37001	Alamance County	NC	-0.625	-0.590	-0.574	-0.558	-0.437	-0.361	-0.326	-0.292	0.078	0.078	0.078	0.078	-0.655	-0.643	-0.637	-0.632	-0.759	-0.741	-0.733	-0.725
37011	Avery County	NC	-1.003	-0.968	-0.952	-0.936	-0.423	-0.347	-0.312	-0.278	0.135	0.135	0.135	0.135	1.053	1.065	1.071	1.076	0.600	0.618	0.626	0.634
37021	Buncombe County	NC	-0.168	-0.134	-0.117	-0.102	0.742	0.818	0.853	0.887	0.158	0.158	0.158	0.158	-0.008	0.004	0.010	0.016	-0.366	-0.348	-0.339	-0.331
37027	Caldwell County	NC	-0.968	-0.933	-0.917	-0.902	-1.264	-1.188	-1.153	-1.119	-0.187	-0.187	-0.187	-0.187	0.053	0.065	0.071	0.076	0.452	0.470	0.478	0.486
37035	Catawba County	NC	-0.588	-0.553	-0.537	-0.521	-0.460	-0.384	-0.349	-0.315	0.192	0.192	0.192	0.192	-0.516	-0.504	-0.498	-0.493	-1.351	-1.333	-1.325	-1.317
37037	Chatham County	NC	0.618	0.653	0.669	0.685	0.896	0.972	1.007	1.041	1.409	1.409	1.409	1.409	0.757	0.769	0.775	0.781	0.547	0.565	0.573	0.581
37051	Cumberland County	NC	-0.533	-0.498	-0.482	-0.466	-0.756	-0.680	-0.645	-0.611	-0.857	-0.857	-0.857	-0.857	-2.444	-2.432	-2.426	-2.421	-0.803	-0.785	-0.776	-0.768
37057	Davidson County	NC	-0.624	-0.589	-0.573	-0.558	-0.847	-0.771	-0.736	-0.702	-0.213	-0.213	-0.213	-0.213	0.035	0.047	0.053	0.058	-0.943	-0.925	-0.916	-0.908

Table C-1Table C-: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
37059	Davie County	NC	0.200	0.235	0.251	0.266	0.189	0.265	0.300	0.334	-1.992	-1.992	-1.992	-1.992	0.603	0.615	0.621	0.626	0.116	0.134	0.142	0.150
37061	Duplin County	NC	-1.271	-1.236	-1.220	-1.204	-1.991	-1.915	-1.880	-1.846	0.202	0.202	0.202	0.202	0.146	0.158	0.164	0.170	-0.305	-0.287	-0.279	-0.271
37063	Durham County	NC	0.144	0.179	0.195	0.211	0.951	1.026	1.062	1.096	-0.129	-0.129	-0.129	-0.129	-1.799	-1.786	-1.781	-1.775	-0.694	-0.676	-0.668	-0.660
37065	Edgecombe County	NC	-2.409	-2.374	-2.358	-2.343	-2.126	-2.051	-2.015	-1.981	-1.564	-1.564	-1.564	-1.564	0.033	0.045	0.051	0.057	0.053	0.071	0.079	0.087
37067	Forsyth County	NC	-0.258	-0.223	-0.207	-0.192	0.378	0.454	0.489	0.523	0.331	0.331	0.331	0.331	-1.831	-1.819	-1.813	-1.807	-1.256	-1.238	-1.230	-1.222
37069	Franklin County	NC	-0.346	-0.311	-0.295	-0.280	-0.975	-0.900	-0.864	-0.831	0.178	0.178	0.178	0.178	0.764	0.776	0.782	0.787	0.297	0.315	0.323	0.332
37071	Gaston County	NC	-0.662	-0.627	-0.611	-0.595	-1.209	-1.134	-1.098	-1.064	-0.696	-0.696	-0.696	-0.696	-0.774	-0.761	-0.756	-0.750	-0.889	-0.871	-0.863	-0.855
37077	Granville County	NC	-0.302	-0.267	-0.251	-0.235	-1.215	-1.139	-1.104	-1.070	-0.685	-0.685	-0.685	-0.685	-0.194	-0.182	-0.176	-0.171	0.064	0.082	0.091	0.099
37081	Guilford County	NC	-0.202	-0.167	-0.151	-0.135	0.673	0.749	0.784	0.818	0.156	0.156	0.156	0.156	-1.452	-1.440	-1.434	-1.428	-0.956	-0.938	-0.930	-0.922
37089	Henderson County	NC	0.010	0.045	0.061	0.077	0.505	0.580	0.616	0.650	0.362	0.362	0.362	0.362	0.442	0.454	0.460	0.465	0.957	0.975	0.983	0.991
37099	Jackson County	NC	-0.585	-0.550	-0.534	-0.518	0.109	0.185	0.220	0.254	-0.399	-0.399	-0.399	-0.399	0.033	0.045	0.051	0.056	-0.140	-0.122	-0.114	-0.106
37101	Johnston County	NC	0.124	0.158	0.175	0.190	-0.593	-0.517	-0.482	-0.448	0.424	0.424	0.424	0.424	0.021	0.033	0.039	0.044	0.391	0.409	0.417	0.425
37107	Lenoir County	NC	-2.019	-1.984	-1.968	-1.952	-1.259	-1.183	-1.147	-1.114	0.219	0.219	0.219	0.219	-1.327	-1.314	-1.309	-1.303	0.135	0.153	0.161	0.169
37109	Lincoln County	NC	-0.234	-0.199	-0.183	-0.167	-0.494	-0.419	-0.383	-0.350	0.948	0.948	0.948	0.948	-0.135	-0.123	-0.117	-0.111	0.167	0.185	0.193	0.201
37111	McDowell County	NC	-1.160	-1.125	-1.109	-1.094	-1.149	-1.073	-1.037	-1.004	0.562	0.562	0.562	0.562	0.427	0.439	0.445	0.450	-0.824	-0.806	-0.798	-0.790
37119	Mecklenburg County	NC	0.374	0.409	0.425	0.440	0.836	0.912	0.948	0.981	0.752	0.752	0.752	0.752	-2.140	-2.128	-2.122	-2.117	-1.652	-1.634	-1.625	-1.617
37121	Mitchell County	NC	-1.475	-1.440	-1.424	-1.408	-0.669	-0.594	-0.558	-0.524	1.027	1.027	1.027	1.027	2.159	2.172	2.178	2.183	0.025	0.043	0.052	0.060
37123	Montgomery County	NC	-1.579	-1.544	-1.528	-1.513	-1.324	-1.248	-1.213	-1.179	0.651	0.651	0.651	0.651	-0.202	-0.190	-0.184	-0.179	-0.195	-0.177	-0.169	-0.161
37129	New Hanover County	NC	0.054	0.088	0.105	0.120	0.931	1.007	1.042	1.076	0.607	0.607	0.607	0.607	-1.047	-1.035	-1.029	-1.023	-0.091	-0.073	-0.065	-0.057
37135	Orange County	NC	0.431	0.466	0.482	0.498	2.033	2.109	2.144	2.178	0.323	0.323	0.323	0.323	-0.196	-0.184	-0.178	-0.173	-0.669	-0.651	-0.643	-0.635
37145	Person County	NC	-0.556	-0.521	-0.505	-0.489	-0.949	-0.873	-0.838	-0.804	-2.787	-2.787	-2.787	-2.787	0.066	0.079	0.085	0.090	0.395	0.413	0.421	0.429
37147	Pitt County	NC	-1.304	-1.269	-1.253	-1.238	-0.138	-0.062	-0.027	0.007	0.390	0.390	0.390	0.390	-1.554	-1.542	-1.536	-1.531	-0.082	-0.064	-0.055	-0.047
37157	Rockingham County	NC	-1.119	-1.085	-1.068	-1.053	-1.332	-1.256	-1.220	-1.187	-0.270	-0.270	-0.270	-0.270	-0.452	-0.440	-0.434	-0.429	0.099	0.117	0.125	0.133
37159	Rowan County	NC	-0.709	-0.674	-0.658	-0.642	-0.766	-0.690	-0.654	-0.621	-0.989	-0.989	-0.989	-0.989	-0.140	-0.128	-0.122	-0.117	-1.240	-1.221	-1.213	-1.205
37179	Union County	NC	0.824	0.859	0.875	0.891	0.222	0.298	0.333	0.367	1.174	1.174	1.174	1.174	0.121	0.133	0.139	0.144	0.265	0.283	0.291	0.300
37183	Wake County	NC	1.027	1.061	1.078	1.093	1.576	1.652	1.687	1.721	0.567	0.567	0.567	0.567	0.093	0.105	0.111	0.116	-0.825	-0.807	-0.798	-0.790
37189	Watauga County	NC	-0.800	-0.766	-0.749	-0.734	1.547	1.623	1.659	1.692	-0.551	-0.551	-0.551	-0.551	0.595	0.607	0.613	0.619	0.209	0.227	0.235	0.244

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
37191	Wayne County	NC	-0.896	-0.861	-0.845	-0.830	-1.180	-1.104	-1.069	-1.035	-0.089	-0.089	-0.089	-0.089	-0.983	-0.971	-0.965	-0.959	-0.493	-0.475	-0.466	-0.458
37199	Yancey County	NC	-1.457	-1.423	-1.406	-1.391	-0.317	-0.241	-0.206	-0.172	0.662	0.662	0.662	0.662	1.575	1.588	1.593	1.599	0.230	0.248	0.257	0.265
38017	Cass County	ND	0.619	0.654	0.670	0.686	1.303	1.379	1.414	1.448	0.644	0.644	0.644	0.644	0.248	0.260	0.266	0.272	0.752	0.770	0.778	0.786
38105	Williams County	ND	0.930	0.965	0.981	0.997	0.203	0.279	0.314	0.348	0.556	0.556	0.556	0.556	1.172	1.185	1.190	1.196	0.775	0.793	0.802	0.810
39003	Allen County	OH	-0.630	-0.595	-0.579	-0.563	-0.449	-0.373	-0.338	-0.304	-0.829	-0.829	-0.829	-0.829	-0.599	-0.587	-0.581	-0.576	0.768	0.786	0.794	0.802
39007	Ashtabula County	OH	-0.938	-0.904	-0.887	-0.872	-1.041	-0.965	-0.930	-0.896	-0.460	-0.460	-0.460	-0.460	1.869	1.881	1.887	1.892	0.614	0.632	0.641	0.649
39013	Belmont County	OH	-0.855	-0.820	-0.804	-0.789	-0.804	-0.728	-0.693	-0.659	0.314	0.314	0.314	0.314	1.588	1.600	1.606	1.612	0.469	0.487	0.496	0.504
39017	Butler County	OH	0.184	0.219	0.235	0.251	0.128	0.204	0.239	0.273	-0.987	-0.987	-0.987	-0.987	-0.509	-0.497	-0.491	-0.485	-0.041	-0.023	-0.015	-0.007
39023	Clark County	OH	-0.388	-0.353	-0.337	-0.322	-0.638	-0.562	-0.527	-0.493	-1.713	-1.713	-1.713	-1.713	-0.582	-0.569	-0.564	-0.558	0.250	0.268	0.276	0.284
39025	Clermont County	OH	0.701	0.736	0.752	0.767	0.156	0.232	0.267	0.301	-0.161	-0.161	-0.161	-0.161	0.653	0.666	0.671	0.677	0.067	0.085	0.094	0.102
39027	Clinton County	OH	0.107	0.142	0.158	0.174	-0.724	-0.648	-0.613	-0.579	-3.460	-3.460	-3.460	-3.460	0.892	0.904	0.910	0.916	0.221	0.239	0.247	0.255
39035	Cuyahoga County	OH	-0.676	-0.641	-0.625	-0.609	0.304	0.380	0.415	0.449	-0.582	-0.582	-0.582	-0.582	-0.023	-0.010	-0.005	0.001	-0.868	-0.850	-0.841	-0.833
39041	Delaware County	OH	1.973	2.008	2.024	2.039	1.781	1.856	1.892	1.926	1.339	1.339	1.339	1.339	0.993	1.006	1.011	1.017	0.437	0.455	0.463	0.471
39049	Franklin County	OH	-0.061	-0.026	-0.010	0.006	0.403	0.479	0.514	0.548	0.065	0.065	0.065	0.065	-1.643	-1.630	-1.624	-1.619	0.083	0.101	0.110	0.118
39057	Greene County	OH	0.419	0.454	0.470	0.486	0.881	0.957	0.992	1.026	-0.557	-0.557	-0.557	-0.557	0.200	0.213	0.218	0.224	0.081	0.099	0.107	0.115
39061	Hamilton County	OH	0.002	0.037	0.053	0.068	0.376	0.451	0.487	0.521	-0.171	-0.171	-0.171	-0.171	-0.890	-0.877	-0.872	-0.866	-0.713	-0.695	-0.687	-0.679
39063	Hancock County	OH	0.303	0.338	0.354	0.370	0.501	0.577	0.612	0.646	-0.235	-0.235	-0.235	-0.235	0.403	0.416	0.421	0.427	0.957	0.975	0.983	0.991
39083	Knox County	OH	-0.295	-0.261	-0.244	-0.229	-0.166	-0.090	-0.055	-0.021	0.660	0.660	0.660	0.660	1.933	1.946	1.952	1.957	0.467	0.485	0.493	0.501
39085	Lake County	OH	0.620	0.655	0.671	0.687	0.520	0.596	0.631	0.665	0.114	0.114	0.114	0.114	1.251	1.263	1.269	1.275	-0.713	-0.695	-0.687	-0.679
39087	Lawrence County	OH	-0.999	-0.964	-0.948	-0.932	-1.316	-1.241	-1.205	-1.171	-0.053	-0.053	-0.053	-0.053	1.619	1.631	1.637	1.642	-0.010	0.008	0.017	0.025
39089	Licking County	OH	0.235	0.270	0.286	0.301	0.124	0.200	0.235	0.269	0.696	0.696	0.696	0.696	0.385	0.397	0.403	0.408	0.375	0.394	0.402	0.410
39093	Lorain County	OH	-0.067	-0.032	-0.016	-0.001	0.071	0.147	0.183	0.216	-0.775	-0.775	-0.775	-0.775	0.608	0.621	0.626	0.632	0.251	0.269	0.277	0.286
39095	Lucas County	OH	-1.247	-1.212	-1.196	-1.181	-0.141	-0.066	-0.030	0.004	-1.389	-1.389	-1.389	-1.389	-1.434	-1.422	-1.416	-1.411	-0.741	-0.723	-0.714	-0.706
39099	Mahoning County	OH	-0.941	-0.906	-0.890	-0.874	-0.072	0.004	0.039	0.073	-0.680	-0.680	-0.680	-0.680	-0.297	-0.285	-0.279	-0.273	-0.811	-0.793	-0.784	-0.776
39103	Medina County	OH	1.060	1.095	1.111	1.127	0.974	1.049	1.085	1.119	0.551	0.551	0.551	0.551	1.779	1.792	1.797	1.803	0.086	0.104	0.112	0.120
39109	Miami County	OH	0.394	0.429	0.445	0.461	0.169	0.245	0.281	0.314	-2.349	-2.349	-2.349	-2.349	1.063	1.076	1.082	1.087	0.598	0.616	0.624	0.632
39113	Montgomery County	OH	-0.631	-0.596	-0.580	-0.564	0.038	0.114	0.149	0.183	-0.347	-0.347	-0.347	-0.347	-0.409	-0.397	-0.391	-0.386	-0.897	-0.879	-0.871	-0.863

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
39115	Morgan County	OH	-2.223	-2.188	-2.172	-2.156	-1.497	-1.421	-1.386	-1.352	-1.149	-1.149	-1.149	-1.149	1.559	1.571	1.577	1.582	0.202	0.220	0.228	0.236
39133	Portage County	OH	0.136	0.171	0.187	0.203	0.294	0.370	0.405	0.439	0.114	0.114	0.114	0.114	0.646	0.658	0.664	0.670	0.344	0.362	0.371	0.379
39135	Preble County	OH	0.133	0.167	0.184	0.199	-0.655	-0.580	-0.544	-0.510	-2.857	-2.857	-2.857	-2.857	1.144	1.156	1.162	1.168	0.001	0.019	0.028	0.036
39145	Scioto County	OH	-1.677	-1.642	-1.626	-1.610	-1.507	-1.431	-1.396	-1.362	-1.951	-1.951	-1.951	-1.951	-1.235	-1.222	-1.217	-1.211	-0.542	-0.524	-0.515	-0.507
39151	Stark County	OH	-0.333	-0.298	-0.282	-0.266	0.098	0.174	0.209	0.243	-0.322	-0.322	-0.322	-0.322	0.162	0.174	0.180	0.186	0.136	0.154	0.163	0.171
39153	Summit County	OH	-0.028	0.006	0.023	0.038	0.456	0.532	0.567	0.601	-0.254	-0.254	-0.254	-0.254	-0.215	-0.203	-0.197	-0.192	0.022	0.040	0.048	0.056
39155	Trumbull County	OH	-0.867	-0.833	-0.816	-0.801	-0.441	-0.365	-0.330	-0.296	-1.564	-1.564	-1.564	-1.564	0.264	0.277	0.282	0.288	0.009	0.027	0.035	0.043
39165	Warren County	OH	1.252	1.286	1.303	1.318	1.000	1.076	1.111	1.145	1.292	1.292	1.292	1.292	1.170	1.183	1.189	1.194	-0.185	-0.167	-0.159	-0.151
39167	Washington County	OH	-0.621	-0.586	-0.570	-0.554	-0.464	-0.388	-0.353	-0.319	-0.465	-0.465	-0.465	-0.465	1.277	1.290	1.295	1.301	0.406	0.424	0.433	0.441
39173	Wood County	OH	0.260	0.294	0.311	0.326	0.853	0.929	0.965	0.998	0.258	0.258	0.258	0.258	0.604	0.616	0.622	0.628	0.569	0.587	0.596	0.604
40017	Canadian County	OK	1.156	1.191	1.207	1.223	0.140	0.216	0.251	0.285	0.312	0.312	0.312	0.312	-0.518	-0.506	-0.500	-0.495	0.728	0.746	0.754	0.763
40019	Carter County	OK	-0.320	-0.285	-0.269	-0.253	-1.453	-1.377	-1.342	-1.308	-0.536	-0.536	-0.536	-0.536	-0.729	-0.716	-0.711	-0.705	0.434	0.452	0.460	0.469
40021	Cherokee County	OK	-1.582	-1.547	-1.531	-1.515	-0.894	-0.818	-0.782	-0.749	0.483	0.483	0.483	0.483	-0.113	-0.100	-0.095	-0.089	0.744	0.762	0.770	0.778
40027	Cleveland County	OK	0.682	0.717	0.733	0.748	0.135	0.211	0.247	0.280	0.190	0.190	0.190	0.190	-0.774	-0.762	-0.756	-0.751	0.821	0.839	0.848	0.856
40037	Creek County	OK	-0.016	0.019	0.035	0.050	-1.289	-1.214	-1.178	-1.144	-0.722	-0.722	-0.722	-0.722	0.547	0.560	0.566	0.571	0.704	0.722	0.730	0.739
40071	Kay County	OK	-0.379	-0.344	-0.328	-0.312	-0.878	-0.803	-0.767	-0.733	0.331	0.331	0.331	0.331	-0.505	-0.493	-0.487	-0.482	0.343	0.362	0.370	0.378
40101	Muskogee County	OK	-1.096	-1.061	-1.045	-1.029	-1.480	-1.405	-1.369	-1.335	-1.062	-1.062	-1.062	-1.062	-0.416	-0.404	-0.398	-0.392	0.380	0.398	0.406	0.414
40109	Oklahoma County	OK	-0.178	-0.143	-0.127	-0.111	-0.472	-0.396	-0.360	-0.327	-0.426	-0.426	-0.426	-0.426	-1.801	-1.789	-1.783	-1.778	0.163	0.181	0.189	0.197
40143	Tulsa County	OK	0.192	0.227	0.243	0.258	-0.323	-0.247	-0.212	-0.178	-0.214	-0.214	-0.214	-0.214	-1.588	-1.576	-1.570	-1.564	-1.465	-1.447	-1.438	-1.430
41001	Baker County	OR	-1.126	-1.091	-1.075	-1.059	0.289	0.365	0.400	0.434	-2.331	-2.331	-2.331	-2.331	1.739	1.752	1.757	1.763	0.343	0.362	0.370	0.378
41003	Benton County	OR	0.127	0.162	0.178	0.194	1.946	2.021	2.057	2.091	1.323	1.323	1.323	1.323	0.461	0.473	0.479	0.484	0.631	0.649	0.657	0.665
41005	Clackamas County	OR	0.870	0.905	0.921	0.937	1.020	1.096	1.131	1.165	1.130	1.130	1.130	1.130	0.447	0.460	0.465	0.471	0.833	0.851	0.859	0.867
41013	Crook County	OR	-0.932	-0.897	-0.881	-0.866	-0.558	-0.483	-0.447	-0.414	0.390	0.390	0.390	0.390	0.926	0.939	0.944	0.950	-2.592	-2.574	-2.565	-2.557
41017	Deschutes County	OR	-0.133	-0.098	-0.082	-0.067	1.014	1.090	1.125	1.159	0.218	0.218	0.218	0.218	0.203	0.215	0.221	0.226	0.712	0.730	0.738	0.747
41019	Douglas County	OR	-1.283	-1.248	-1.232	-1.217	-0.387	-0.311	-0.275	-0.242	0.256	0.256	0.256	0.256	0.997	1.009	1.015	1.020	0.490	0.508	0.516	0.524
41029	Jackson County	OR	-0.947	-0.912	-0.896	-0.880	0.454	0.530	0.566	0.599	0.767	0.767	0.767	0.767	0.381	0.394	0.400	0.405	-0.161	-0.143	-0.134	-0.126
41031	Jefferson County	OR	-1.263	-1.228	-1.212	-1.196	-0.914	-0.839	-0.803	-0.770	-0.912	-0.912	-0.912	-0.912	0.353	0.365	0.371	0.377	-0.467	-0.449	-0.440	-0.432

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
41033	Josephine County	OR	-1.828	-1.794	-1.777	-1.762	-0.309	-0.233	-0.198	-0.164	0.672	0.672	0.672	0.672	0.872	0.884	0.890	0.895	0.103	0.121	0.130	0.138
41035	Klamath County	OR	-1.282	-1.248	-1.231	-1.216	-0.571	-0.496	-0.460	-0.427	-0.304	-0.304	-0.304	-0.304	0.785	0.797	0.803	0.809	-1.159	-1.141	-1.133	-1.125
41039	Lane County	OR	-0.641	-0.606	-0.590	-0.575	0.748	0.824	0.860	0.893	0.332	0.332	0.332	0.332	-0.824	-0.812	-0.806	-0.800	-0.454	-0.436	-0.427	-0.419
41043	Linn County	OR	-0.577	-0.542	-0.526	-0.510	-0.417	-0.341	-0.306	-0.272	-0.342	-0.342	-0.342	-0.342	0.259	0.272	0.277	0.283	-0.286	-0.268	-0.259	-0.251
41047	Marion County	OR	-0.459	-0.425	-0.408	-0.393	-0.356	-0.280	-0.245	-0.211	0.174	0.174	0.174	0.174	-0.384	-0.371	-0.365	-0.360	0.517	0.535	0.543	0.551
41051	Multnomah County	OR	-0.044	-0.010	0.007	0.022	0.857	0.933	0.969	1.002	0.273	0.273	0.273	0.273	-1.370	-1.358	-1.352	-1.347	0.143	0.161	0.170	0.178
41059	Umatilla County	OR	-0.507	-0.473	-0.456	-0.441	-1.112	-1.037	-1.001	-0.967	-0.527	-0.527	-0.527	-0.527	-0.081	-0.069	-0.063	-0.058	0.207	0.225	0.233	0.241
41065	Wasco County	OR	-0.784	-0.749	-0.733	-0.717	0.097	0.173	0.208	0.242	-0.369	-0.369	-0.369	-0.369	0.332	0.344	0.350	0.355	0.587	0.605	0.613	0.621
41067	Washington County	OR	0.906	0.941	0.957	0.973	1.200	1.276	1.312	1.345	0.650	0.650	0.650	0.650	0.394	0.406	0.412	0.418	0.259	0.277	0.286	0.294
41071	Yamhill County	OR	0.112	0.147	0.163	0.179	0.146	0.222	0.257	0.291	0.883	0.883	0.883	0.883	0.690	0.702	0.708	0.713	0.770	0.788	0.797	0.805
42001	Adams County	PA	0.829	0.864	0.880	0.895	-0.158	-0.082	-0.047	-0.013	0.120	0.120	0.120	0.120	1.247	1.259	1.265	1.271	-0.379	-0.361	-0.353	-0.345
42003	Allegheny County	PA	0.151	0.185	0.202	0.217	0.779	0.855	0.890	0.924	-0.339	-0.339	-0.339	-0.339	0.229	0.241	0.247	0.253	-3.924	-3.906	-3.898	-3.890
42005	Armstrong County	PA	-0.271	-0.237	-0.220	-0.205	-0.754	-0.679	-0.643	-0.609	0.298	0.298	0.298	0.298	1.471	1.484	1.489	1.495	0.281	0.299	0.308	0.316
42011	Berks County	PA	0.377	0.411	0.428	0.443	0.166	0.242	0.278	0.311	-0.308	-0.308	-0.308	-0.308	0.354	0.366	0.372	0.378	0.153	0.171	0.179	0.188
42013	Blair County	PA	-0.445	-0.410	-0.394	-0.379	-0.686	-0.610	-0.575	-0.541	-0.101	-0.101	-0.101	-0.101	0.654	0.667	0.672	0.678	0.494	0.512	0.520	0.528
42017	Bucks County	PA	1.603	1.638	1.654	1.670	1.201	1.277	1.312	1.346	0.133	0.133	0.133	0.133	0.660	0.672	0.678	0.683	0.250	0.268	0.276	0.284
42021	Cambria County	PA	-0.825	-0.790	-0.774	-0.758	-0.436	-0.360	-0.325	-0.291	-2.659	-2.659	-2.659	-2.659	0.876	0.888	0.894	0.899	0.001	0.019	0.027	0.035
42027	Centre County	PA	0.024	0.059	0.075	0.090	1.325	1.401	1.436	1.470	0.405	0.405	0.405	0.405	0.820	0.832	0.838	0.843	-0.274	-0.256	-0.248	-0.240
42029	Chester County	PA	1.936	1.971	1.987	2.002	1.632	1.708	1.743	1.777	0.992	0.992	0.992	0.992	0.751	0.763	0.769	0.774	-0.325	-0.307	-0.299	-0.291
42033	Clearfield County	PA	-1.000	-0.965	-0.949	-0.933	-0.989	-0.914	-0.878	-0.844	1.265	1.265	1.265	1.265	0.833	0.845	0.851	0.856	0.341	0.359	0.367	0.375
42041	Cumberland County	PA	1.051	1.086	1.102	1.117	0.877	0.953	0.989	1.022	0.306	0.306	0.306	0.306	0.968	0.981	0.986	0.992	-0.673	-0.655	-0.647	-0.639
42043	Dauphin County	PA	0.442	0.477	0.493	0.509	0.347	0.423	0.458	0.492	0.024	0.024	0.024	0.024	-0.046	-0.034	-0.028	-0.023	-0.839	-0.821	-0.813	-0.805
42045	Delaware County	PA	0.959	0.994	1.010	1.025	0.754	0.829	0.865	0.899	-0.413	-0.413	-0.413	-0.413	0.165	0.177	0.183	0.188	-0.010	0.008	0.017	0.025
42049	Erie County	PA	-0.366	-0.331	-0.315	-0.299	0.046	0.122	0.157	0.191	-1.033	-1.033	-1.033	-1.033	0.326	0.339	0.344	0.350	-0.217	-0.199	-0.190	-0.182
42055	Franklin County	PA	0.740	0.775	0.791	0.807	-0.010	0.066	0.101	0.135	0.082	0.082	0.082	0.082	0.960	0.972	0.978	0.984	0.603	0.621	0.630	0.638
42059	Greene County	PA	-0.707	-0.672	-0.656	-0.641	-0.923	-0.847	-0.811	-0.778	-2.360	-2.360	-2.360	-2.360	0.868	0.880	0.886	0.892	0.341	0.359	0.367	0.375
42063	Indiana County	PA	-0.552	-0.517	-0.501	-0.486	-0.053	0.023	0.058	0.092	-0.192	-0.192	-0.192	-0.192	0.738	0.751	0.757	0.762	0.200	0.218	0.226	0.234

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
42069	Lackawanna County	PA	-0.383	-0.348	-0.332	-0.316	0.169	0.245	0.280	0.314	-0.495	-0.495	-0.495	-0.495	0.627	0.639	0.645	0.650	-0.084	-0.066	-0.058	-0.050
42071	Lancaster County	PA	0.768	0.803	0.819	0.834	0.284	0.360	0.396	0.429	0.344	0.344	0.344	0.344	0.714	0.726	0.732	0.737	-0.020	-0.002	0.006	0.014
42073	Lawrence County	PA	-0.479	-0.444	-0.428	-0.412	-0.190	-0.114	-0.079	-0.045	0.468	0.468	0.468	0.468	0.291	0.304	0.309	0.315	0.371	0.389	0.397	0.405
42077	Lehigh County	PA	0.387	0.422	0.438	0.453	0.459	0.535	0.570	0.604	-0.114	-0.114	-0.114	-0.114	-0.133	-0.120	-0.115	-0.109	0.521	0.539	0.548	0.556
42079	Luzerne County	PA	-0.533	-0.498	-0.482	-0.467	-0.514	-0.439	-0.403	-0.370	-0.947	-0.947	-0.947	-0.947	0.355	0.367	0.373	0.378	0.744	0.762	0.770	0.778
42081	Lycoming County	PA	-0.431	-0.396	-0.380	-0.365	-0.393	-0.317	-0.282	-0.248	1.243	1.243	1.243	1.243	0.730	0.743	0.749	0.754	0.728	0.746	0.754	0.763
42085	Mercer County	PA	-0.655	-0.620	-0.604	-0.588	-0.261	-0.185	-0.150	-0.116	-0.062	-0.062	-0.062	-0.062	0.516	0.528	0.534	0.540	-0.392	-0.374	-0.366	-0.358
42089	Monroe County	PA	0.452	0.487	0.503	0.519	-0.148	-0.072	-0.037	-0.003	-1.548	-1.548	-1.548	-1.548	0.114	0.127	0.132	0.138	0.610	0.628	0.637	0.645
42091	Montgomery County	PA	1.652	1.687	1.703	1.719	1.628	1.704	1.740	1.773	0.411	0.411	0.411	0.411	0.542	0.554	0.560	0.565	0.183	0.201	0.209	0.217
42095	Northampton County	PA	0.743	0.778	0.794	0.810	0.479	0.555	0.590	0.624	-0.607	-0.607	-0.607	-0.607	0.535	0.547	0.553	0.558	-0.686	-0.668	-0.660	-0.652
42101	Philadelphia County	PA	-1.722	-1.687	-1.671	-1.655	-0.690	-0.614	-0.579	-0.545	-2.496	-2.496	-2.496	-2.496	-1.470	-1.457	-1.451	-1.446	-1.853	-1.835	-1.827	-1.818
42117	Tioga County	PA	-0.799	-0.764	-0.748	-0.732	-0.280	-0.204	-0.169	-0.135	-0.598	-0.598	-0.598	-0.598	1.449	1.462	1.467	1.473	0.662	0.680	0.688	0.696
42123	Warren County	PA	-0.168	-0.133	-0.117	-0.101	-0.374	-0.298	-0.262	-0.229	1.542	1.542	1.542	1.542	0.897	0.909	0.915	0.921	0.221	0.239	0.248	0.256
42125	Washington County	PA	0.326	0.361	0.377	0.392	0.165	0.240	0.276	0.310	-0.009	-0.009	-0.009	-0.009	0.651	0.663	0.669	0.675	-0.941	-0.923	-0.915	-0.907
42129	Westmoreland County	PA	0.190	0.225	0.241	0.256	0.367	0.443	0.478	0.512	0.239	0.239	0.239	0.239	0.994	1.006	1.012	1.017	0.113	0.131	0.140	0.148
42133	York County	PA	0.827	0.862	0.878	0.893	0.137	0.213	0.248	0.282	-0.597	-0.597	-0.597	-0.597	0.586	0.598	0.604	0.609	-0.077	-0.059	-0.050	-0.042
44007	Providence County	RI	-0.677	-0.642	-0.626	-0.610	0.008	0.084	0.119	0.153	-0.860	-0.860	-0.860	-0.860	-0.268	-0.256	-0.250	-0.245	0.042	0.060	0.069	0.077
44009	Washington County	RI	0.963	0.998	1.014	1.030	1.515	1.591	1.626	1.660	0.352	0.352	0.352	0.352	0.699	0.711	0.717	0.722	0.566	0.584	0.593	0.601
45003	Aiken County	SC	-0.523	-0.489	-0.472	-0.457	-0.272	-0.196	-0.161	-0.127	0.114	0.114	0.114	0.114	-0.677	-0.664	-0.659	-0.653	0.342	0.360	0.369	0.377
45007	Anderson County	SC	-0.478	-0.443	-0.427	-0.411	-0.989	-0.913	-0.878	-0.844	0.788	0.788	0.788	0.788	-1.473	-1.460	-1.455	-1.449	0.621	0.639	0.648	0.656
45011	Barnwell County	SC	-2.303	-2.268	-2.252	-2.237	-1.873	-1.797	-1.762	-1.728	-0.307	-0.307	-0.307	-0.307	-1.171	-1.159	-1.153	-1.147	0.957	0.975	0.983	0.991
45015	Berkeley County	SC	-0.150	-0.115	-0.099	-0.083	-0.734	-0.658	-0.622	-0.589	0.084	0.084	0.084	0.084	-0.537	-0.524	-0.519	-0.513	0.800	0.818	0.826	0.835
45019	Charleston County	SC	-0.093	-0.058	-0.042	-0.026	0.427	0.502	0.538	0.572	-0.290	-0.290	-0.290	-0.290	-1.485	-1.473	-1.467	-1.462	-0.529	-0.511	-0.502	-0.494
45021	Cherokee County	SC	-1.504	-1.469	-1.453	-1.437	-2.011	-1.935	-1.900	-1.866	-0.827	-0.827	-0.827	-0.827	-0.835	-0.822	-0.817	-0.811	0.495	0.513	0.522	0.530
45025	Chesterfield County	SC	-1.904	-1.869	-1.853	-1.837	-2.165	-2.089	-2.054	-2.020	0.323	0.323	0.323	0.323	-0.536	-0.523	-0.518	-0.512	0.371	0.389	0.397	0.405
45041	Florence County	SC	-1.022	-0.987	-0.971	-0.955	-1.013	-0.938	-0.902	-0.868	-0.240	-0.240	-0.240	-0.240	-1.776	-1.764	-1.758	-1.753	-0.653	-0.635	-0.626	-0.618
45043	Georgetown County	SC	-0.739	-0.704	-0.688	-0.672	-0.108	-0.032	0.003	0.037	0.144	0.144	0.144	0.144	-1.046	-1.033	-1.027	-1.022	0.852	0.870	0.879	0.887

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
45045	Greenville County	SC	-0.086	-0.051	-0.035	-0.019	0.102	0.177	0.213	0.247	0.146	0.146	0.146	0.146	-0.944	-0.932	-0.926	-0.920	-1.411	-1.393	-1.385	-1.377
45063	Lexington County	SC	0.455	0.490	0.506	0.522	0.086	0.162	0.197	0.231	0.788	0.788	0.788	0.788	-0.123	-0.111	-0.105	-0.100	-0.454	-0.436	-0.427	-0.419
45073	Oconee County	SC	-0.821	-0.786	-0.770	-0.754	-0.371	-0.295	-0.260	-0.226	0.366	0.366	0.366	0.366	-0.072	-0.060	-0.054	-0.048	0.513	0.531	0.539	0.547
45077	Pickens County	SC	-0.684	-0.649	-0.633	-0.617	-0.549	-0.473	-0.438	-0.404	0.650	0.650	0.650	0.650	-0.297	-0.285	-0.279	-0.274	0.209	0.227	0.235	0.244
45079	Richland County	SC	-0.163	-0.129	-0.112	-0.097	0.187	0.262	0.298	0.332	-0.124	-0.124	-0.124	-0.124	-1.836	-1.823	-1.817	-1.812	-0.713	-0.695	-0.687	-0.679
45083	Spartanburg County	SC	-0.460	-0.425	-0.409	-0.393	-1.002	-0.926	-0.891	-0.857	-0.589	-0.589	-0.589	-0.589	-1.177	-1.165	-1.159	-1.153	-0.802	-0.784	-0.775	-0.767
45091	York County	SC	-0.058	-0.024	-0.007	0.008	-0.098	-0.022	0.013	0.047	0.451	0.451	0.451	0.451	-0.581	-0.568	-0.563	-0.557	0.318	0.336	0.344	0.352
46011	Brookings County	SD	0.535	0.570	0.586	0.601	1.059	1.135	1.170	1.204	-0.107	-0.107	-0.107	-0.107	1.044	1.057	1.062	1.068	0.806	0.824	0.833	0.841
46013	Brown County	SD	0.390	0.425	0.441	0.457	0.691	0.767	0.802	0.836	-0.083	-0.083	-0.083	-0.083	1.076	1.089	1.094	1.100	0.530	0.548	0.556	0.564
46029	Codington County	SD	0.462	0.497	0.513	0.529	0.343	0.419	0.454	0.488	0.129	0.129	0.129	0.129	0.578	0.590	0.596	0.602	0.585	0.603	0.611	0.619
46099	Minnehaha County	SD	1.035	1.070	1.086	1.101	0.573	0.649	0.685	0.718	-0.011	-0.011	-0.011	-0.011	0.390	0.402	0.408	0.414	0.663	0.681	0.689	0.697
46103	Pennington County	SD	0.316	0.351	0.367	0.383	0.606	0.682	0.718	0.751	0.266	0.266	0.266	0.266	-0.087	-0.075	-0.069	-0.063	0.501	0.519	0.528	0.536
47009	Blount County	TN	-0.012	0.022	0.039	0.054	-0.459	-0.383	-0.347	-0.314	1.964	1.964	1.964	1.964	0.278	0.290	0.296	0.301	-2.116	-2.098	-2.090	-2.082
47011	Bradley County	TN	-0.559	-0.524	-0.508	-0.493	-0.940	-0.864	-0.829	-0.795	1.008	1.008	1.008	1.008	-0.585	-0.573	-0.567	-0.562	0.530	0.548	0.556	0.564
47037	Davidson County	TN	-0.408	-0.373	-0.357	-0.341	0.013	0.089	0.124	0.158	0.723	0.723	0.723	0.723	-2.379	-2.367	-2.361	-2.355	-1.174	-1.156	-1.147	-1.139
47065	Hamilton County	TN	-0.167	-0.132	-0.116	-0.101	-0.140	-0.065	-0.029	0.005	0.431	0.431	0.431	0.431	-1.775	-1.763	-1.757	-1.752	-0.971	-0.953	-0.945	-0.937
47093	Knox County	TN	-0.137	-0.102	-0.086	-0.071	0.126	0.202	0.238	0.271	0.134	0.134	0.134	0.134	-1.160	-1.147	-1.141	-1.136	-1.290	-1.272	-1.263	-1.255
47113	Madison County	TN	-0.655	-0.620	-0.604	-0.589	-0.424	-0.348	-0.313	-0.279	0.477	0.477	0.477	0.477	-2.001	-1.989	-1.983	-1.978	0.083	0.101	0.110	0.118
47119	Maury County	TN	-0.615	-0.580	-0.564	-0.548	-1.040	-0.964	-0.929	-0.895	1.493	1.493	1.493	1.493	-0.468	-0.455	-0.449	-0.444	-0.242	-0.224	-0.216	-0.208
47125	Montgomery County	TN	-0.200	-0.165	-0.149	-0.134	-0.781	-0.705	-0.670	-0.636	-0.438	-0.438	-0.438	-0.438	-0.886	-0.874	-0.868	-0.862	-0.405	-0.386	-0.378	-0.370
47141	Putnam County	TN	-1.154	-1.119	-1.103	-1.088	-0.795	-0.719	-0.683	-0.650	1.662	1.662	1.662	1.662	-0.746	-0.734	-0.728	-0.722	0.084	0.102	0.110	0.118
47155	Sevier County	TN	-0.669	-0.635	-0.618	-0.603	-1.109	-1.033	-0.998	-0.964	0.471	0.471	0.471	0.471	-1.261	-1.248	-1.243	-1.237	0.022	0.040	0.048	0.056
47157	Shelby County	TN	-0.783	-0.748	-0.732	-0.716	-0.494	-0.418	-0.383	-0.349	0.470	0.470	0.470	0.470	-3.150	-3.137	-3.132	-3.126	-1.501	-1.483	-1.475	-1.467
47163	Sullivan County	TN	-0.397	-0.362	-0.346	-0.331	-0.753	-0.677	-0.642	-0.608	0.481	0.481	0.481	0.481	-0.607	-0.594	-0.589	-0.583	-1.465	-1.447	-1.438	-1.430
47187	Williamson County	TN	2.067	2.102	2.118	2.134	1.781	1.857	1.893	1.926	3.170	3.170	3.170	3.170	0.965	0.977	0.983	0.988	0.469	0.487	0.496	0.504
47189	Wilson County	TN	0.708	0.743	0.759	0.775	0.036	0.112	0.147	0.181	-1.032	-1.032	-1.032	-1.032	0.073	0.085	0.091	0.097	0.238	0.256	0.264	0.272
48029	Bexar County	TX	-0.334	-0.299	-0.283	-0.267	-0.548	-0.472	-0.437	-0.403	-0.085	-0.085	-0.085	-0.085	-2.894	-2.881	-2.876	-2.870	-0.466	-0.448	-0.440	-0.432

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
48037	Bowie County	TX	-0.865	-0.830	-0.814	-0.799	-1.124	-1.048	-1.013	-0.979	0.655	0.655	0.655	0.655	-0.677	-0.664	-0.658	-0.653	-0.240	-0.221	-0.213	-0.205
48039	Brazoria County	TX	0.865	0.900	0.916	0.931	-0.500	-0.424	-0.389	-0.355	1.335	1.335	1.335	1.335	0.082	0.094	0.100	0.106	0.644	0.662	0.670	0.678
48061	Cameron County	TX	-2.958	-2.924	-2.907	-2.892	-1.831	-1.755	-1.720	-1.686	1.245	1.245	1.245	1.245	-1.831	-1.819	-1.813	-1.807	-0.311	-0.293	-0.284	-0.276
48085	Collin County	TX	1.704	1.738	1.755	1.770	1.278	1.354	1.389	1.423	1.516	1.516	1.516	1.516	-0.272	-0.259	-0.253	-0.248	0.487	0.505	0.513	0.521
48113	Dallas County	TX	-0.408	-0.373	-0.357	-0.341	-0.610	-0.535	-0.499	-0.466	-1.259	-1.259	-1.259	-1.259	-1.905	-1.893	-1.887	-1.881	-0.441	-0.423	-0.415	-0.407
48121	Denton County	TX	1.498	1.533	1.549	1.565	0.568	0.643	0.679	0.713	-0.118	-0.118	-0.118	-0.118	-0.126	-0.113	-0.107	-0.102	-0.161	-0.143	-0.134	-0.126
48135	Ector County	TX	0.059	0.094	0.110	0.125	-2.408	-2.332	-2.296	-2.263	0.356	0.356	0.356	0.356	-1.124	-1.112	-1.106	-1.101	0.452	0.470	0.478	0.486
48139	Ellis County	TX	0.852	0.887	0.903	0.919	-0.730	-0.655	-0.619	-0.585	0.877	0.877	0.877	0.877	-0.091	-0.078	-0.073	-0.067	-0.251	-0.233	-0.225	-0.217
48141	El Paso County	TX	-1.742	-1.707	-1.691	-1.675	-1.141	-1.065	-1.029	-0.996	-1.189	-1.189	-1.189	-1.189	-0.741	-0.729	-0.723	-0.718	-2.093	-2.075	-2.067	-2.059
48149	Fayette County	TX	0.264	0.299	0.315	0.330	-0.331	-0.256	-0.220	-0.186	1.317	1.317	1.317	1.317	1.464	1.476	1.482	1.488	0.301	0.319	0.327	0.335
48167	Galveston County	TX	0.389	0.423	0.440	0.455	-0.635	-0.559	-0.524	-0.490	2.538	2.538	2.538	2.538	-0.807	-0.794	-0.789	-0.783	0.414	0.432	0.441	0.449
48183	Gregg County	TX	0.040	0.074	0.091	0.106	-1.202	-1.126	-1.091	-1.057	-0.591	-0.591	-0.591	-0.591	-2.146	-2.134	-2.128	-2.122	0.655	0.673	0.682	0.690
48201	Harris County	TX	0.086	0.120	0.137	0.152	-0.631	-0.555	-0.520	-0.486	0.119	0.119	0.119	0.119	-1.750	-1.738	-1.732	-1.727	-2.886	-2.868	-2.859	-2.851
48203	Harrison County	TX	-0.167	-0.132	-0.116	-0.101	-0.962	-0.887	-0.851	-0.817	-0.929	-0.929	-0.929	-0.929	-0.287	-0.274	-0.268	-0.263	-0.010	0.008	0.017	0.025
48209	Hays County	TX	0.426	0.461	0.477	0.493	0.444	0.520	0.555	0.589	0.703	0.703	0.703	0.703	0.057	0.069	0.075	0.081	0.763	0.781	0.789	0.797
48215	Hidalgo County	TX	-3.206	-3.171	-3.155	-3.140	-1.812	-1.736	-1.701	-1.667	-0.160	-0.160	-0.160	-0.160	-1.755	-1.743	-1.737	-1.731	-0.330	-0.312	-0.303	-0.295
48221	Hood County	TX	0.786	0.821	0.837	0.852	-0.087	-0.011	0.025	0.058	1.160	1.160	1.160	1.160	0.667	0.679	0.685	0.690	0.845	0.863	0.871	0.879
48231	Hunt County	TX	-0.236	-0.201	-0.185	-0.169	-1.353	-1.277	-1.242	-1.208	-0.665	-0.665	-0.665	-0.665	-0.816	-0.804	-0.798	-0.792	0.837	0.855	0.864	0.872
48245	Jefferson County	TX	-0.745	-0.711	-0.694	-0.679	-1.326	-1.250	-1.215	-1.181	-0.461	-0.461	-0.461	-0.461	-1.275	-1.262	-1.256	-1.251	-1.066	-1.048	-1.039	-1.031
48251	Johnson County	TX	0.612	0.647	0.663	0.678	-1.465	-1.389	-1.354	-1.320	0.694	0.694	0.694	0.694	0.152	0.164	0.170	0.175	0.572	0.590	0.599	0.607
48257	Kaufman County	TX	0.627	0.662	0.678	0.693	-1.486	-1.410	-1.374	-1.341	1.373	1.373	1.373	1.373	-0.445	-0.433	-0.427	-0.421	0.063	0.081	0.089	0.097
48303	Lubbock County	TX	-0.118	-0.083	-0.067	-0.051	-0.485	-0.410	-0.374	-0.340	0.718	0.718	0.718	0.718	-1.938	-1.925	-1.920	-1.914	0.679	0.697	0.705	0.713
48309	McLennan County	TX	-0.813	-0.779	-0.762	-0.747	-0.959	-0.883	-0.848	-0.814	0.747	0.747	0.747	0.747	-1.494	-1.482	-1.476	-1.471	0.205	0.223	0.231	0.239
48339	Montgomery County	TX	1.088	1.123	1.139	1.155	-0.077	-0.001	0.034	0.068	0.907	0.907	0.907	0.907	0.004	0.016	0.022	0.027	-0.095	-0.077	-0.068	-0.060
48355	Nueces County	TX	-0.344	-0.309	-0.293	-0.277	-1.013	-0.937	-0.901	-0.868	-0.271	-0.271	-0.271	-0.271	-2.396	-2.384	-2.378	-2.372	0.023	0.041	0.049	0.057
48361	Orange County	TX	-0.222	-0.187	-0.171	-0.155	-2.038	-1.962	-1.927	-1.893	0.341	0.341	0.341	0.341	-0.233	-0.221	-0.215	-0.210	0.123	0.141	0.150	0.158
48367	Parker County	TX	0.838	0.873	0.889	0.905	-0.276	-0.200	-0.165	-0.131	1.546	1.546	1.546	1.546	0.610	0.622	0.628	0.633	0.564	0.582	0.590	0.598

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
48375	Potter County	TX	-1.107	-1.072	-1.056	-1.040	-2.524	-2.449	-2.413	-2.379	0.424	0.424	0.424	0.424	-2.068	-2.056	-2.050	-2.045	0.759	0.777	0.785	0.793
48423	Smith County	TX	0.022	0.057	0.073	0.088	-0.204	-0.128	-0.092	-0.059	0.940	0.940	0.940	0.940	-0.477	-0.465	-0.459	-0.453	0.720	0.738	0.746	0.755
48439	Tarrant County	TX	0.465	0.499	0.516	0.531	-0.290	-0.215	-0.179	-0.145	-0.081	-0.081	-0.081	-0.081	-1.399	-1.387	-1.381	-1.375	-0.633	-0.615	-0.606	-0.598
48453	Travis County	TX	0.363	0.398	0.414	0.430	0.871	0.947	0.982	1.016	0.369	0.369	0.369	0.369	-1.695	-1.683	-1.677	-1.671	0.053	0.071	0.079	0.087
48469	Victoria County	TX	-0.033	0.002	0.018	0.034	-1.053	-0.977	-0.942	-0.908	-0.908	-0.908	-0.908	-0.908	-1.184	-1.171	-1.165	-1.160	0.866	0.884	0.893	0.901
48479	Webb County	TX	-1.716	-1.681	-1.665	-1.650	-1.939	-1.863	-1.828	-1.794	-2.022	-2.022	-2.022	-2.022	-2.880	-2.868	-2.862	-2.857	-0.150	-0.132	-0.123	-0.115
48485	Wichita County	TX	-0.175	-0.140	-0.124	-0.108	-1.097	-1.021	-0.986	-0.952	0.442	0.442	0.442	0.442	-2.032	-2.019	-2.014	-2.008	0.686	0.704	0.712	0.720
49005	Cache County	UT	0.629	0.663	0.680	0.695	0.664	0.740	0.775	0.809	2.205	2.205	2.205	2.205	0.502	0.514	0.520	0.525	-0.783	-0.765	-0.756	-0.748
49011	Davis County	UT	1.549	1.583	1.600	1.615	0.473	0.549	0.584	0.618	0.644	0.644	0.644	0.644	0.190	0.202	0.208	0.214	0.022	0.040	0.048	0.056
49035	Salt Lake County	UT	1.098	1.133	1.149	1.165	0.185	0.261	0.296	0.330	0.428	0.428	0.428	0.428	-1.527	-1.515	-1.509	-1.504	-1.290	-1.272	-1.263	-1.255
49047	Uintah County	UT	1.133	1.167	1.184	1.199	-0.971	-0.896	-0.860	-0.826	1.055	1.055	1.055	1.055	0.374	0.387	0.392	0.398	0.130	0.148	0.157	0.165
49049	Utah County	UT	0.874	0.909	0.925	0.941	0.138	0.213	0.249	0.283	1.602	1.602	1.602	1.602	-0.086	-0.074	-0.068	-0.062	-1.047	-1.029	-1.021	-1.013
49053	Washington County	UT	0.513	0.547	0.564	0.579	0.373	0.449	0.485	0.518	1.569	1.569	1.569	1.569	0.300	0.312	0.318	0.324	0.257	0.275	0.284	0.292
49057	Weber County	UT	0.569	0.604	0.620	0.636	-0.632	-0.556	-0.521	-0.487	1.156	1.156	1.156	1.156	-0.529	-0.516	-0.511	-0.505	-0.797	-0.779	-0.770	-0.762
50007	Chittenden County	VT	0.993	1.028	1.044	1.059	1.676	1.752	1.787	1.821	0.627	0.627	0.627	0.627	-0.443	-0.431	-0.425	-0.420	0.425	0.443	0.451	0.459
50021	Rutland County	VT	0.075	0.110	0.126	0.142	0.583	0.659	0.694	0.728	-0.379	-0.379	-0.379	-0.379	0.304	0.316	0.322	0.328	0.083	0.101	0.110	0.118
50025	Windham County	VT	0.336	0.371	0.387	0.403	1.274	1.350	1.385	1.419	-0.365	-0.365	-0.365	-0.365	0.579	0.591	0.597	0.603	0.957	0.975	0.983	0.991
51003	Albemarle County	VA	1.519	1.554	1.570	1.585	1.775	1.851	1.886	1.920	-0.393	-0.393	-0.393	-0.393	0.264	0.277	0.282	0.288	0.402	0.420	0.429	0.437
51033	Caroline County	VA	0.602	0.636	0.653	0.668	-0.756	-0.680	-0.645	-0.611	0.683	0.683	0.683	0.683	0.890	0.903	0.908	0.914	0.569	0.587	0.596	0.604
51041	Chesterfield County	VA	1.615	1.650	1.666	1.682	0.783	0.859	0.894	0.928	0.221	0.221	0.221	0.221	0.378	0.391	0.396	0.402	0.010	0.028	0.037	0.045
51047	Culpeper County	VA	1.020	1.055	1.071	1.087	-0.362	-0.286	-0.251	-0.217	-0.972	-0.972	-0.972	-0.972	0.652	0.665	0.671	0.676	0.957	0.975	0.983	0.991
51059	Fairfax County	VA	2.655	2.690	2.706	2.722	2.369	2.445	2.480	2.514	1.006	1.006	1.006	1.006	0.601	0.614	0.619	0.625	-0.356	-0.338	-0.330	-0.322
51061	Fauquier County	VA	1.928	1.963	1.979	1.994	0.890	0.966	1.001	1.035	0.162	0.162	0.162	0.162	1.092	1.105	1.110	1.116	0.801	0.819	0.827	0.835
51085	Hanover County	VA	1.931	1.965	1.982	1.997	1.098	1.174	1.209	1.243	1.324	1.324	1.324	1.324	1.198	1.210	1.216	1.221	0.313	0.331	0.339	0.347
51087	Henrico County	VA	1.134	1.169	1.185	1.200	1.050	1.126	1.161	1.195	0.167	0.167	0.167	0.167	-0.075	-0.062	-0.057	-0.051	-0.309	-0.291	-0.283	-0.275
51107	Loudoun County	VA	2.866	2.901	2.917	2.933	1.901	1.977	2.012	2.046	1.596	1.596	1.596	1.596	0.728	0.740	0.746	0.752	0.316	0.334	0.342	0.350
51139	Page County	VA	-0.676	-0.641	-0.625	-0.610	-1.251	-1.175	-1.140	-1.106	-1.927	-1.927	-1.927	-1.927	1.112	1.125	1.130	1.136	0.329	0.347	0.356	0.364

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
51153	Prince William County	VA	2.144	2.179	2.195	2.211	0.788	0.863	0.899	0.933	0.380	0.380	0.380	0.380	0.343	0.355	0.361	0.366	0.712	0.730	0.738	0.747
51161	Roanoke County	VA	1.296	1.331	1.347	1.362	0.927	1.003	1.038	1.072	-0.177	-0.177	-0.177	-0.177	0.980	0.993	0.998	1.004	0.679	0.697	0.705	0.714
51165	Rockingham County	VA	0.813	0.847	0.864	0.879	0.162	0.238	0.273	0.307	1.907	1.907	1.907	1.907	1.453	1.465	1.471	1.477	0.478	0.496	0.504	0.512
51179	Stafford County	VA	2.144	2.179	2.195	2.211	0.540	0.615	0.651	0.685	0.847	0.847	0.847	0.847	0.788	0.800	0.806	0.812	0.750	0.768	0.776	0.784
51197	Wythe County	VA	-0.525	-0.490	-0.474	-0.458	-1.139	-1.063	-1.028	-0.994	-2.075	-2.075	-2.075	-2.075	1.070	1.083	1.088	1.094	0.626	0.644	0.653	0.661
51510	Alexandria city	VA	1.900	1.935	1.951	1.967	2.026	2.102	2.138	2.171	-0.498	-0.498	-0.498	-0.498	0.101	0.114	0.119	0.125	0.742	0.760	0.769	0.777
51710	Norfolk city	VA	-0.872	-0.837	-0.821	-0.806	-1.085	-1.009	-0.974	-0.940	-0.745	-0.745	-0.745	-0.745	-2.185	-2.172	-2.166	-2.161	0.469	0.487	0.496	0.504
51800	Suffolk city	VA	0.744	0.779	0.795	0.811	-0.237	-0.161	-0.125	-0.092	0.943	0.943	0.943	0.943	0.126	0.138	0.144	0.150	0.133	0.151	0.159	0.167
51810	Virginia Beach city	VA	1.355	1.390	1.406	1.422	0.706	0.782	0.817	0.851	-0.002	-0.002	-0.002	-0.002	-0.003	0.009	0.015	0.021	-0.191	-0.173	-0.164	-0.156
53007	Chelan County	WA	-0.096	-0.062	-0.045	-0.030	0.493	0.569	0.604	0.638	0.362	0.362	0.362	0.362	0.232	0.244	0.250	0.255	-0.161	-0.143	-0.134	-0.126
53009	Clallam County	WA	-0.368	-0.333	-0.317	-0.301	0.720	0.796	0.831	0.865	0.450	0.450	0.450	0.450	0.545	0.557	0.563	0.569	0.380	0.398	0.406	0.414
53011	Clark County	WA	0.362	0.397	0.413	0.429	0.399	0.474	0.510	0.544	0.270	0.270	0.270	0.270	0.150	0.162	0.168	0.173	0.371	0.389	0.397	0.405
53015	Cowlitz County	WA	-0.639	-0.605	-0.588	-0.573	-0.694	-0.618	-0.583	-0.549	-0.417	-0.417	-0.417	-0.417	-0.185	-0.173	-0.167	-0.161	0.757	0.775	0.783	0.791
53021	Franklin County	WA	-0.555	-0.520	-0.504	-0.488	-1.725	-1.649	-1.613	-1.580	0.405	0.405	0.405	0.405	-0.068	-0.056	-0.050	-0.044	0.696	0.714	0.722	0.730
53025	Grant County	WA	-0.630	-0.595	-0.579	-0.563	-1.274	-1.198	-1.163	-1.129	0.258	0.258	0.258	0.258	-1.231	-1.218	-1.213	-1.207	0.663	0.681	0.689	0.697
53027	Grays Harbor County	WA	-0.933	-0.898	-0.882	-0.867	-1.066	-0.990	-0.954	-0.921	-0.217	-0.217	-0.217	-0.217	-0.028	-0.016	-0.010	-0.004	0.688	0.706	0.714	0.722
53031	Jefferson County	WA	0.102	0.137	0.153	0.169	1.919	1.995	2.030	2.064	-0.157	-0.157	-0.157	-0.157	0.669	0.681	0.687	0.693	0.664	0.682	0.690	0.698
53033	King County	WA	1.215	1.250	1.266	1.282	1.626	1.702	1.737	1.771	0.148	0.148	0.148	0.148	-0.883	-0.871	-0.865	-0.859	0.163	0.181	0.189	0.197
53035	Kitsap County	WA	0.718	0.752	0.769	0.784	0.846	0.922	0.957	0.991	0.217	0.217	0.217	0.217	0.266	0.278	0.284	0.289	0.624	0.642	0.651	0.659
53037	Kittitas County	WA	-0.534	-0.499	-0.483	-0.467	0.761	0.837	0.872	0.906	0.630	0.630	0.630	0.630	-0.996	-0.983	-0.977	-0.972	0.436	0.454	0.463	0.471
53039	Klickitat County	WA	-1.012	-0.978	-0.961	-0.946	0.252	0.328	0.363	0.397	-0.163	-0.163	-0.163	-0.163	1.077	1.089	1.095	1.101	0.822	0.840	0.848	0.856
53041	Lewis County	WA	-0.766	-0.732	-0.715	-0.700	-0.470	-0.394	-0.359	-0.325	0.294	0.294	0.294	0.294	0.041	0.054	0.059	0.065	0.911	0.929	0.937	0.946
53045	Mason County	WA	-0.298	-0.263	-0.247	-0.231	-0.167	-0.091	-0.055	-0.022	-0.105	-0.105	-0.105	-0.105	-0.563	-0.550	-0.545	-0.539	0.712	0.730	0.738	0.747
53047	Okanogan County	WA	-1.213	-1.178	-1.162	-1.146	-0.394	-0.319	-0.283	-0.249	-0.654	-0.654	-0.654	-0.654	0.445	0.457	0.463	0.468	-0.013	0.005	0.014	0.022
53053	Pierce County	WA	0.458	0.493	0.509	0.524	-0.129	-0.053	-0.017	0.016	0.365	0.365	0.365	0.365	-1.030	-1.018	-1.012	-1.007	0.183	0.201	0.209	0.217
53057	Skagit County	WA	0.281	0.316	0.332	0.348	0.385	0.461	0.496	0.530	0.679	0.679	0.679	0.679	-0.664	-0.652	-0.646	-0.640	0.837	0.855	0.864	0.872
53061	Snohomish County	WA	1.069	1.104	1.120	1.136	0.668	0.744	0.779	0.813	-0.143	-0.143	-0.143	-0.143	-0.131	-0.118	-0.113	-0.107	0.143	0.161	0.170	0.178

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
53063	Spokane County	WA	-0.105	-0.070	-0.054	-0.039	0.435	0.511	0.547	0.580	0.327	0.327	0.327	0.327	-0.518	-0.506	-0.500	-0.494	0.221	0.239	0.248	0.256
53067	Thurston County	WA	0.816	0.850	0.867	0.882	1.013	1.089	1.125	1.158	-0.033	-0.033	-0.033	-0.033	-0.078	-0.065	-0.059	-0.054	0.373	0.391	0.399	0.407
53071	Walla Walla County	WA	-0.444	-0.409	-0.393	-0.378	0.234	0.309	0.345	0.379	0.308	0.308	0.308	0.308	-0.203	-0.191	-0.185	-0.179	0.416	0.434	0.442	0.450
53073	Whatcom County	WA	0.002	0.036	0.053	0.068	1.157	1.233	1.268	1.302	0.236	0.236	0.236	0.236	-0.201	-0.188	-0.183	-0.177	0.806	0.824	0.833	0.841
53077	Yakima County	WA	-0.868	-0.833	-0.817	-0.801	-1.145	-1.069	-1.034	-1.000	0.330	0.330	0.330	0.330	-1.395	-1.383	-1.377	-1.372	-0.010	0.008	0.017	0.025
54003	Berkeley County	WV	0.441	0.476	0.492	0.508	-1.069	-0.993	-0.958	-0.924	-0.921	-0.921	-0.921	-0.921	-0.141	-0.128	-0.123	-0.117	-0.082	-0.064	-0.055	-0.047
54025	Greenbrier County	WV	-1.027	-0.992	-0.976	-0.960	-1.205	-1.130	-1.094	-1.061	-0.495	-0.495	-0.495	-0.495	1.134	1.147	1.152	1.158	0.653	0.671	0.679	0.687
54033	Harrison County	WV	-0.605	-0.570	-0.554	-0.538	-0.621	-0.545	-0.510	-0.476	-0.194	-0.194	-0.194	-0.194	0.323	0.335	0.341	0.346	-0.830	-0.812	-0.804	-0.796
54039	Kanawha County	WV	-0.197	-0.163	-0.146	-0.131	-0.696	-0.620	-0.585	-0.551	-0.255	-0.255	-0.255	-0.255	-0.659	-0.647	-0.641	-0.636	-0.217	-0.199	-0.190	-0.182
54049	Marion County	WV	-0.769	-0.734	-0.718	-0.702	-0.706	-0.630	-0.595	-0.561	-0.270	-0.270	-0.270	-0.270	0.838	0.851	0.857	0.862	-1.348	-1.330	-1.322	-1.313
54051	Marshall County	WV	-0.748	-0.713	-0.697	-0.681	-0.931	-0.855	-0.820	-0.786	0.240	0.240	0.240	0.240	0.895	0.908	0.913	0.919	-1.691	-1.673	-1.664	-1.656
54061	Monongalia County	WV	-0.102	-0.068	-0.051	-0.036	0.173	0.248	0.284	0.318	0.177	0.177	0.177	0.177	-0.174	-0.161	-0.155	-0.150	-0.010	0.008	0.017	0.025
54069	Ohio County	WV	-0.466	-0.431	-0.415	-0.399	-0.075	0.001	0.037	0.070	-0.259	-0.259	-0.259	-0.259	0.201	0.213	0.219	0.225	0.010	0.028	0.037	0.045
54081	Raleigh County	WV	-0.962	-0.928	-0.911	-0.896	-1.495	-1.420	-1.384	-1.350	0.200	0.200	0.200	0.200	-0.393	-0.380	-0.375	-0.369	-0.249	-0.231	-0.222	-0.214
54099	Wayne County	WV	-0.914	-0.879	-0.863	-0.848	-1.812	-1.736	-1.701	-1.667	-0.528	-0.528	-0.528	-0.528	0.313	0.325	0.331	0.337	0.806	0.824	0.833	0.841
54107	Wood County	WV	-0.462	-0.427	-0.411	-0.395	-0.651	-0.575	-0.540	-0.506	-0.409	-0.409	-0.409	-0.409	0.230	0.242	0.248	0.254	-0.194	-0.176	-0.168	-0.160
55009	Brown County	WI	0.680	0.715	0.731	0.746	0.793	0.868	0.904	0.938	-0.793	-0.793	-0.793	-0.793	0.546	0.559	0.564	0.570	-0.466	-0.448	-0.440	-0.432
55021	Columbia County	WI	0.830	0.865	0.881	0.896	0.550	0.626	0.661	0.695	0.534	0.534	0.534	0.534	0.912	0.924	0.930	0.935	0.775	0.793	0.802	0.810
55025	Dane County	WI	0.974	1.008	1.025	1.040	1.983	2.058	2.094	2.128	0.633	0.633	0.633	0.633	0.168	0.180	0.186	0.191	-0.365	-0.347	-0.339	-0.331
55027	Dodge County	WI	0.639	0.674	0.690	0.706	-0.147	-0.071	-0.036	-0.002	-0.341	-0.341	-0.341	-0.341	1.335	1.348	1.353	1.359	0.434	0.452	0.460	0.468
55029	Door County	WI	0.375	0.410	0.426	0.441	1.581	1.657	1.692	1.726	1.266	1.266	1.266	1.266	1.557	1.570	1.576	1.581	0.629	0.648	0.656	0.664
55039	Fond du Lac County	WI	0.703	0.738	0.754	0.770	0.312	0.388	0.423	0.457	-0.692	-0.692	-0.692	-0.692	1.109	1.122	1.128	1.133	0.878	0.896	0.905	0.913
55043	Grant County	WI	-0.010	0.024	0.041	0.056	0.118	0.194	0.229	0.263	-0.073	-0.073	-0.073	-0.073	1.330	1.342	1.348	1.353	-0.762	-0.744	-0.736	-0.728
55055	Jefferson County	WI	0.808	0.842	0.859	0.874	0.652	0.728	0.763	0.797	-0.747	-0.747	-0.747	-0.747	1.120	1.133	1.138	1.144	0.765	0.783	0.791	0.799
55059	Kenosha County	WI	0.543	0.578	0.594	0.609	0.126	0.202	0.237	0.271	0.298	0.298	0.298	0.298	0.341	0.353	0.359	0.365	0.139	0.157	0.166	0.174
55063	La Crosse County	WI	0.347	0.382	0.398	0.413	1.160	1.236	1.271	1.305	0.613	0.613	0.613	0.613	0.497	0.509	0.515	0.521	0.490	0.508	0.517	0.525
55071	Manitowoc County	WI	0.494	0.529	0.545	0.560	0.397	0.473	0.508	0.542	0.043	0.043	0.043	0.043	1.454	1.466	1.472	1.477	0.363	0.381	0.389	0.397

Table C-1: Tourism Impacts Simulation results by the U.S. counties (continued)

			Material QOL				Social QOL1				Social QOL2				Social QOL3				Environmental QOL			
			Tourism development scenario: 10% of business establishments increase, 15% increase, and 20% increase.																			
FIPS	County	State	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%	Initial	10%	15%	20%
55073	Marathon County	WI	0.793	0.828	0.844	0.860	0.689	0.765	0.800	0.834	-1.115	-1.115	-1.115	-1.115	1.062	1.075	1.080	1.086	0.831	0.849	0.857	0.865
55079	Milwaukee County	WI	-0.455	-0.420	-0.404	-0.389	0.166	0.242	0.277	0.311	-1.881	-1.881	-1.881	-1.881	-1.614	-1.601	-1.595	-1.590	0.173	0.191	0.199	0.207
55087	Outagamie County	WI	0.848	0.883	0.899	0.915	0.977	1.053	1.088	1.122	1.238	1.238	1.238	1.238	0.538	0.550	0.556	0.562	0.316	0.334	0.342	0.350
55089	Ozaukee County	WI	1.690	1.725	1.741	1.757	2.028	2.104	2.139	2.173	1.012	1.012	1.012	1.012	1.441	1.453	1.459	1.465	0.209	0.227	0.235	0.243
55101	Racine County	WI	0.421	0.456	0.472	0.487	0.331	0.406	0.442	0.476	1.310	1.310	1.310	1.310	0.201	0.213	0.219	0.225	0.749	0.767	0.775	0.783
55105	Rock County	WI	0.129	0.164	0.180	0.196	0.056	0.132	0.168	0.201	-1.146	-1.146	-1.146	-1.146	0.081	0.094	0.099	0.105	0.688	0.706	0.715	0.723
55109	St. Croix County	WI	1.494	1.529	1.545	1.561	1.332	1.407	1.443	1.477	1.274	1.274	1.274	1.274	0.920	0.933	0.938	0.944	0.598	0.616	0.624	0.632
55111	Sauk County	WI	0.604	0.639	0.655	0.671	0.393	0.469	0.504	0.538	1.102	1.102	1.102	1.102	0.416	0.429	0.435	0.440	0.581	0.599	0.607	0.615
55117	Sheboygan County	WI	0.762	0.797	0.813	0.829	0.615	0.691	0.726	0.760	0.547	0.547	0.547	0.547	0.623	0.635	0.641	0.646	0.579	0.597	0.606	0.614
55127	Walworth County	WI	0.580	0.615	0.631	0.647	0.566	0.642	0.677	0.711	-0.281	-0.281	-0.281	-0.281	0.628	0.640	0.646	0.651	0.758	0.776	0.784	0.792
55131	Washington County	WI	1.382	1.417	1.433	1.449	1.241	1.317	1.353	1.386	0.303	0.303	0.303	0.303	1.149	1.161	1.167	1.172	0.885	0.903	0.912	0.920
55133	Waukesha County	WI	1.809	1.844	1.860	1.875	1.881	1.956	1.992	2.026	0.790	0.790	0.790	0.790	1.184	1.197	1.202	1.208	0.407	0.425	0.433	0.442
56001	Albany County	WY	-0.064	-0.029	-0.013	0.003	1.486	1.562	1.597	1.631	0.321	0.321	0.321	0.321	-0.099	-0.087	-0.081	-0.075	0.463	0.481	0.490	0.498
56007	Carbon County	WY	0.831	0.866	0.882	0.897	-0.433	-0.357	-0.322	-0.288	-0.110	-0.110	-0.110	-0.110	0.659	0.671	0.677	0.682	0.679	0.697	0.705	0.713
56009	Converse County	WY	1.132	1.166	1.183	1.198	-0.041	0.035	0.070	0.104	0.565	0.565	0.565	0.565	1.044	1.056	1.062	1.068	0.420	0.438	0.447	0.455
56013	Fremont County	WY	0.050	0.084	0.101	0.116	-0.289	-0.213	-0.178	-0.144	0.859	0.859	0.859	0.859	0.356	0.368	0.374	0.380	0.362	0.380	0.388	0.396
56021	Laramie County	WY	0.756	0.791	0.807	0.823	0.129	0.205	0.240	0.274	0.579	0.579	0.579	0.579	-0.198	-0.186	-0.180	-0.174	0.912	0.930	0.938	0.946
56023	Lincoln County	WY	1.172	1.207	1.223	1.238	0.623	0.699	0.734	0.768	0.285	0.285	0.285	0.285	1.504	1.517	1.523	1.528	0.752	0.770	0.778	0.786
56025	Natrona County	WY	0.880	0.915	0.931	0.947	0.005	0.081	0.116	0.150	0.106	0.106	0.106	0.106	-0.326	-0.313	-0.307	-0.302	0.957	0.975	0.983	0.991
56029	Park County	WY	0.471	0.505	0.522	0.537	0.840	0.916	0.951	0.985	0.661	0.661	0.661	0.661	0.720	0.732	0.738	0.743	0.796	0.814	0.822	0.830
56033	Sheridan County	WY	0.677	0.712	0.728	0.744	0.680	0.755	0.791	0.825	0.848	0.848	0.848	0.848	0.978	0.990	0.996	1.002	0.758	0.776	0.784	0.792
56037	Sweetwater County	WY	1.818	1.853	1.869	1.885	-0.539	-0.463	-0.428	-0.394	0.042	0.042	0.042	0.042	-0.029	-0.017	-0.011	-0.006	0.269	0.287	0.295	0.303
56039	Teton County	WY	1.909	1.944	1.960	1.976	2.544	2.620	2.655	2.689	1.073	1.073	1.073	1.073	0.441	0.453	0.459	0.465	0.783	0.801	0.810	0.818
56041	Uinta County	WY	1.244	1.278	1.295	1.310	-0.428	-0.352	-0.317	-0.283	0.774	0.774	0.774	0.774	0.704	0.717	0.723	0.728	0.837	0.855	0.864	0.872

VITA

VITA

Sangchoul Yi, Ph.D.

EDUCATION:

Ph.D. Hospitality and Tourism Management May 2015
Purdue University, West Lafayette, IN
Dissertation Title: Modeling Impacts of Hospitality and Tourism Enterprises on Community Quality of Life

M.S., Hospitality and Tourism Management Dec. 2008
Purdue University, West Lafayette, IN
Thesis Title: Lodging Demand for Drive Tourism in Rural Areas

Completion of Master Courses in Fisheries Business Administration Feb. 2004
Pukyong National University Busan, South Korea

B.B.A. in Fisheries Business Administration Feb. 2002
Pukyong National University Busan, South Korea

PEER-REVIEWED JOURNAL PUBLICATIONS:

Yi, S. Day J., & Cai, L.A., (2014) Exploring tourist perceived value: An investigation of Asian cruise tourists' travel experience, *Journal of Quality Assurance in Hospitality and Tourism*, 15 (1).

Yi, S. Day J., & Cai, L.A., (2013) Factors influencing self-drive vacation travelers' length of stay, *International Journal of Tourism and Anthropology*, 3 (1).

Yi, S. Day J., & Cai, L.A., (2012) Cohort analysis of tourists' spending on lodging during recreational fishing trips, *Tourism Analysis*, 17 (1).

Yi, S. Day J., & Cai, L.A., (2011). Rural tourism demand: Duration modelling for drive tourists' length of stay in rural areas of the United States. *Journal of Tourism Challenges and Trends*, 4(1).

PEER-REVIEWED CONFERENCE PRESENTATIONS AND ABSTRACTS:

Stand-up presentations

Yi, S. Day J., & Cai, L.A., (2014) Influence of Hospitality and Tourism Businesses on Improving Community Quality of Life. Proceedings of the 19th Annual Graduate Education and Graduate Student Research Conference in Hospitality and Tourism, Houston, TX, January 3-5.

Yi, S. Day J., & Cai, L.A., (2013) Influence of Household Characteristics on Drive Tourism Demand: A Multilevel Modeling Approach. Proceedings of the 32nd Annual International

Society of Travel and Tourism Educators (ISTTE) Conference, Detroit, MI, October 17-19.

Yi, S. Day J., & Cai, L.A., (2013) Does Cruise Destination Image Affect Tourists' Behavioral Intention? Proceedings of the 18th Annual Graduate Education and Graduate Student Research Conference in Hospitality and Tourism, Seattle, WA, January 3-5.

Yi, S. Day J., & Cai, L.A., (2011) Drive Tourists' Lodging Demand Determinants for Highway Hotels and Motels in U.S. Proceedings of the 16th Annual Graduate Education and Graduate Student Research Conference in Hospitality and Tourism, Houston, TX, January 6-8.

Yi, S. Day J., & Cai, L.A., (2011) Exploring Asian Cruise Travelers' Travel Experience and Perceptions. Proceedings of the 16th Annual Graduate Education and Graduate Student Research Conference in Hospitality and Tourism, Houston, TX, January 6-8.

Yi, S., Silkes, C.A. & Cai, L. A. (2010) Place branding extension and brand attitude: From culinary tourists' perception. In L. Lowry (Ed.), Proceedings of the 2010 Annual International Society of Travel and Tourism Educators (ISTTE) Conference, in Long Beach, California, Catalina Island, California and Ensenada, Mexico, October, 18-22.

Yi, S. Day J., & Cai, L.A., (2010) Cohort analysis of lodging expenditure on fishing trips in rural tourism. Proceedings of the 15th Annual Graduate Education and Graduate Student Research Conference in Hospitality and Tourism, Washington D.C., January 7-9.

Yi, S. & Cai, L.A. (2009) Determinants of lodging expenditure for recreational fishing trips in rural tourism. In L. Lowry (Ed.), Proceedings of the 2009 Annual International Society of Travel and Tourism Educators (ISTTE) Conference, in San Antonio, Texas, October 15-17.

Silkes, C.A., **Yi, S**. & Cai, L.A., (2009) The role of trip motivation on customer's satisfaction and behavioral intention: A rural culinary tourism perspective. In L. Lowry (Ed.), Proceedings of the 2009 Annual International Society of Travel and Tourism Educators (ISTTE) Conference, in San Antonio, Texas October 15-17.

Poster presentations

Yi, S. Day J., & Cai, L.A., (2013) Multilevel Analysis of Event Attendees' Quality of Life. The 3rd Health and Human Science Research Day, West Lafayette, IN, Oct 21.

Yi, S. Day J., & Cai, L.A., (2013) Influence of Festivals and Local Events on Residents' Quality of Life. Proceedings of the 2013 TTRA Annual Conference, Kansas City, MO, June 20-22.

Yi, S. Day J., & Cai, L.A., (2013) Effects of a Social Unit on Tourism Demand. Proceedings of the 18th Annual Graduate Education and Graduate Student Research Conference in

Hospitality and Tourism, Seattle, WA, January 3-5.

Yi, S. Day J., & Cai, L.A., (2011) Moderate Effects of Brand Awareness on eWOM Intention: Perspectives in Community-based Festival Tourism. Proceedings of the 16th Annual Graduate Education and Graduate Student Research Conference in Hospitality and Tourism, Houston, TX January 6-8.

Yi, S. Cai, L.A. & Silkes, C.A., (2009) Asian Cruise Travelers' Perceptions of Cruising Experience. Proceedings of the 14th Annual Graduate Education and Graduate Student Research Conference in Hospitality and Tourism, Las Vegas, NV, USA January 4-6.

Yi, S. Silkes, C.A., Ismail, J. & Cai, L.A., (2009) Lodging Demand Determinates for Drive Tourism in Rural Areas. Proceedings of the 14th Annual Graduate Education and Graduate Student Research Conference in Hospitality and Tourism, Las Vegas, NV, USA January 4-6.

RECENT AWARDS:

* Gaza restaurant scholarship (2013)

* Best paper award (2009, OCT, 15), International Society of Travel and Tourism Educator (ISTTE) annual conference