5-1-2015

The Impacts of a Smoking Ban on Gaming Volume and Customers' Satisfaction in the Casino Industry in South Korea

Sojeong Lee
University of Nevada, Las Vegas

THE IMPACTS OF A SMOKING BAN ON GAMING VOLUME AND CUSTOMERS' SATISFACTION IN THE CASINO INDUSTRY IN SOUTH KOREA

By

Sojeong Lee

Bachelor of Tourism in College of Social Sciences

Hanyang University

Seoul, Korea

1999

A thesis submitted in partial fulfillment

of the requirements for the

Master of Science - Hotel Administration

William F. Harrah College of Hotel Administration

The Graduate College

University of Nevada, Las Vegas

May 2015

UNLV | GRADUATE COLLEGE

We recommend the thesis prepared under our supervision by

Sojeong Lee

entitled

"The Impacts of a Smoking Ban on Gaming Volume and Customers' Satisfaction in the Casino Industry in South Korea"

is approved in partial fulfillment of the requirements for the degree of

Master of Science - Hotel Administration

William F. Harrah College of Hotel Administration

Toni Repetti, Ph.D., Committee Chair

Bo Bernhard, Ph.D., Committee Member

Ashok K. Singh, Ph.D., Committee Member

Bradley S. Wimmer, Ph.D., Graduate College Representative

Kathryn Hausbeck Korgan, Ph.D., Interim Dean of the Graduate College

May 2015

ABSTRACT

The Impacts of a Smoking Ban on Gaming Volume and Customers' Satisfaction in the Casino Industry in South Korea

by

Sojeong Lee

Dr. Toni Repetti, Examination Committee Chair
Assistant Professor of Hotel Administration
University of Nevada, Las Vegas

This thesis examined a smoking ban impacts on gaming volume and customers' satisfaction in the casino industry in South Korea. Aggregate monthly data is obtained from Kangwonland casino from April 2003 to May 2013. This thesis employed multiple regression models with the autoregressive integrated moving average [ARIMA] models. Two models are run to account for the economic impact; table games drop and slot machine coin-in. In addition, to examine the customers' satisfaction toward the smoking ban, another secondary data set is adopted from Kangwonland. Hypotheses associated with gaming volume and customers' satisfaction were tested by using R programming at a .05 alpha level.

The findings show that a smoking ban does not significantly impact on both table games drop and slot coin-in and that both smokers and non-smokers are satisfied with the smoke-free gaming environment. This thesis uses long-term time period frame unlike previous literature, providing new insights in understanding gamblers satisfaction toward smoke-free gaming environment. Additionally, this thesis adds valuable empirical results to the limited literature base associated with the impact of a smoking ban in Asian casino. The findings of this study suggest that future research continue to investigate on casino properties under competitive environments using diverse research approaches.

ACKNOWLEDGEMENTS

For the last two years, the journey of my studies in UNLV was unforgettable moment in my life. I would like to truly acknowledge my committee members, my company, friends, and family. Without their persistent support and encouragement I would never have been able to complete this thesis.

The deepest appreciation goes to my committee chair, Dr. Toni Repetti, for her sincere advice and invaluable guidance throughout the thesis process. I thank Dr. Ashok K. Singh for his statistical guidance on the data analyses and to Dr. Bradley Wimmer for insightful comments for research.

I gratefully acknowledge colleagues from Table Game team and HRD team in Kangwonland Inc. for consideration that enabled me to conduct my thesis. A special word of gratitude is to my company, Kangwonland Inc., for giving me once-in-a-lifetime opportunity to study and financial support.

Finally, my heartfelt thanks go to my family. With gratitude, I acknowledge the love and support that I have received from my family. My parents, Sanghyun Lee and Kyungja Yong, always have a faith in me. My brothers and sister-in-law, Kwonhyung Lee, Daehyung Lee, and Miju Song, supported me by taking good card of my parents. My precious niece and nephew, Minseo Lee and Junyeong Lee, always make me smile. I expand my thanks to my best friends, Soyoung Yun and Bokhee Woo, who never stopped challenging and helping me develop my ideas.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

The reduction in smoking rates among adults is a worldwide trend (Organization for Economic Cooperation and Development [OECD] Factbook, 2014). Globally, prevalence of smoking has declined from 42% in 1965 to 18% in 2012 (Surgeon General, 2014). A growing number of countries have legislated smoke-free policies in enclosed public areas and have extended the policies to hospitality facilities (World Health Organization [WHO], 2009). However, some states and countries exempt gaming areas from the smoking law fully or partially. In Nevada, smoking is prohibited in most public places and indoor places of employment but the Nevada Clean Indoor Air Act does not apply to gaming areas in casinos (Nevada Clean Indoor Air Act, 2006). Likewise, casinos in Atlantic City (New Jersey Smoke-Free Air Act, 2006), Pennsylvania (Pennsylvania Clean Indoor Air Act, 2008), and Indian casinos in Arizona (Smoke Free Arizona Act, 2007) are exempt from smoke-free laws fully or partially. Not only inside of the United States but also outside of the country, gaming venues are often exempt from many smoking laws. In Singapore, smoking prohibition was first introduced in 1970 and has been progressively extended to cover virtually all indoor places and areas where the public congregate (Smoking Act Singapore, 1992). However, Marina Bay Sands casino and Resorts World Singapore casino are exempt from the smoking ban policy, so patrons can smoke inside of the gaming area while gambling (Choong, 2013). In South Korea, Kangwonland casino has been the only casino, which fully banned smoking in the public gaming area out of 17 legalized casinos since 2005 (Kangwonland, 2006).

The harmful effects of second-hand smoke are well known. Smokers are not the only ones affected by toxic chemicals of tobacco, but so are the non-smokers. Casino management has argued against the recommended smoking bans that designating non-smoking areas on the gaming floor or improving filtration systems with high ceilings can avoid the dangerous effects of second-hand smoke for non-smokers without fully banning smoking on the gaming floor (Fellinger, 2014). WHO, however, recommends implementing 100% smoke-free environments. According to WHO (2009), a complete ban on indoor smoking is the only way to reduce exposure to second-hand tobacco smoke in enclosed areas and to provide a safe level of protection. In spite of the health benefits, smoking ban laws stimulate huge debate.

Anti-smoking policy is controversial for a number of reasons, such as smokers' strong opposition, government ordinance, public health, and economic anxiety. Casino management may worry that a smoking ban policy will result in a significant decline of casino revenue because the break for smoking may interfere with continuing play. Several studies have examined the economic impact of smoking bans on casino revenue with different results (Garrett & Pakko, 2010; Lal & Siahpush, 2008; Mandel, Alamar, & Glantz, 2005; Thalheimer & Ali, 2008). In the United States, when Delaware and Illinois banned smoking on the gaming floor, gaming revenue dropped dramatically (Garrett & Pakko, 2010; Thalheimer & Ali, 2008). According to Garrett and Pakko (2010), although a nationwide recession began at the same time as the smoking ban, Illinois casinos experienced losses of more than 20% after a smoking ban implementation. Lal and Siahpush (2008) showed that, in Victoria, Australia, an abrupt decrease in slot machine revenues resulted from the smoke-free policy.

There are alternative studies that showed no statistically significant difference in gaming revenue directly related to the smoke-free laws in Delaware (Mandel et al., 2005). Another study by Harris et al. (2011) found that casino admissions in Illinois did not decline significantly relative to neighboring states, nor did admissions increase in neighboring states where smoking was permitted. Therefore, further analysis should be done to determine if the revenue change was attributed to the smoking ban. The decline might actually be the effect of other factors, such as the financial crisis, alternative gaming options, or inter-state competition. These factors can be a more substantial reason for the decrease in gross gaming revenues (Barrow & Borges, 2014; Repetti, 2011). Also, many of these studies have considered a short time frame. Additional studies with a long-term time frame and examining external factors are needed to evaluate the impacts of smoke-free policies in the casino industry.

Purpose of the Study

The purpose of this study is to determine the effects of a smoking ban on gaming volume and customers' satisfaction. Kangwonland casino allowed smoking in public gambling areas and the members-only gaming rooms when opened in 2000, but fully banned smoking in the public areas in January 2005 for the health of players and employees (Kangwonland, 2006). Smoking on the casino floor is allowed in enclosed airport-style smoking rooms that do not contain any gaming tables or slot machines and in the separate members-only gaming rooms.

By comparing gaming volume (table games drop and slot machine coin-in) before and after the implementation of the smoking ban policy and by analyzing a customers' survey after the implementation, this study can contribute to the literature by adding

knowledge about the economic effects of a smoking ban on gaming volume and provide practical implications. In addition, this study can answer casino management's questions, as well as add new information to the field, as no other studies have examined the economic impact of an Asian casino's smoke-free laws. This study is the first to examine if there is a clear economic impact from a smoking ban policy in the Asian casino industry. Moreover, this study can enhance the understanding of customers' satisfaction related to a smoking ban in a casino.

Statement of the Problem

The goals of this study are to evaluate gaming volume changes before and after the smoking ban policy and to investigate patrons' satisfaction with the smoke-free environment after the smoking ban policy was implemented in Kangwonland casino. Based on the previous research and purposes, two research questions have been formulated. The research questions are as follows:

1. Does a smoking ban policy affect gaming volume in the casino?

In order to investigate the effect of a smoking ban policy on gaming volume, it is necessary to analyze the change in revenue over a long period of time while taking into account other variables which may cause the revenue change, such as regulation change, weather events, or an economic crisis (Barrow & Borges, 2014; Repetti, 2011).

2. Does a customers' smoking status (current smoker/non-smoker) affect their satisfaction to a smoking ban policy?

Smokers and non-smokers have different attitudes toward smoking ban policies. Non-smokers are more likely to support smoking bans than smokers (Ashley et al., 2000). Based on the study by Ashley et al., smokers may patronize casinos less and non-smokers

may patronize more or may not change their patronage if the casino becomes smoke-free. Smokers may continue to patronize the smoke-free casino even though they are not satisfied with the policy for numerous reasons, such as location and driving distance. Smokers may be satisfied with the smoke-free environment if they care more about public health than the freedom of smoking (Bloom, Smoot, Shore, & Shore, 1991).

Justification

A smoking ban in casinos is controversial for a number of reasons and casino management cannot ignore the trend of reduced smoking rates any longer. A number of studies have examined the economic impact of a smoking bans on casino revenue but the results are contradicting and further analyses are needed to determine if the revenue change was attributed to the smoking ban.

Kangwonland is geographically located in the run-down former coal mining area of Kangwon Province and the site is one of the most remote locations in South Korea. In spite of the poor public transportation accessibility, Kangwonland casino does a thriving business all year round. Kangwonland remains a monopoly under a special law until 2025 so external threats such as economic recessions, weather events, and policy changes hardly affect the casino revenue or profit. Given these circumstances, Kangwonland casino will be a good case for analyzing the effects of a smoking ban policy on gaming volume.

According to Kangwonland game regulations, nobody can take the seat while the seat owner leaves to smoke. All seats for table games in Kangwonland are taken and designated as soon as the casino opens at 10 o'clock in the morning. If the seat owner leaves for a meal, smoke, or to take a break, the seat is vacant until the owner comes

back. In the case of slot machines, players can leave for 10 minutes for smoking break, without another player taking their seats.

To analyze gaming volume, the data of table games drop and slot machines coin-in will be collected from Kangwonland casino reflecting the period from April 2003 to May 2013. Additionally, another secondary data set will be used to examine satisfaction with the smoking ban policy. The data is the customers' survey which was collected in 2006. The results of the survey will help in predicting the gamblers' responses to a smoking ban policy. This study will be useful for casinos that attempt to decide whether a smoking ban policy on the gaming floor should be implemented or not.

Definitions of Terms

Meanings of gambling and smoking related words are defined as follows (in alphabetical order).

- Coin-in. The total amount of money wagered in a slot machine. Also known as "handle" or "credits played". (Greenlees, 2008).
- Cotinine. A product formed after the chemical nicotine enters the body. Nicotine is a chemical found in tobacco products, including cigarettes and chewing tobacco. Measuring cotinine in people's blood is the most reliable way to determine exposure to nicotine for both smokers and nonsmokers exposed to environmental tobacco smoke. Measuring cotinine is preferred to measuring nicotine because cotinine remains in the body longer (Centers for Disease Control and Prevention, 2009).
- Drop. For table games, the total amount of currency and chips removed from the drop box along with any credit issued at the table (Kilby, Fox, & Lucas, 2005).

- Casino Revenue. The amount a gaming operation earns before taxes, salaries, and other expenses — the equivalent of "sales," not "profit." (American Gaming Association [AGA], 2013). In other words, it is defined as the amount won by the casino after all wagers have been paid to winning customers (Greenlees, 2008).
- Racino. Also called Racetrack Casino. A hybrid of a pari-mutuel venue, such as horse track, dog track or jai alai court, and a casino. Typically, the casino at a racino offers only slot machine games (AGA, 2013).
- Slot Machine. Any mechanical or electronic device in which outcomes are determined by a random-number generator located inside the terminal (AGA, 2013).

CHAPTER 2

REVIEW OF THE RELATED LITERATURE

Introduction

This chapter begins with a discussion of the current trends of smoking rates and the effects of second-hand smoking. It then goes into the financial impact of smoking ban policies in the hospitality and casino industries. The core of this literature review is focused on the economic impact of a smoking ban and the relationship with smoking and gambling. To broaden the understanding of patrons' attitude to a smoke-free environment, psychological reactance theory is introduced and the different customers' reaction between smokers and non-smokers is discussed. Lastly, current trends of smoking in South Korea and the smoking ban policy in Kangwonland casino are introduced.

Current Trends of a Smoking Ban Policy

In the United States, 15% of adults were current cigarette smokers in 2011 and this rate has declined from 42% in 1965 (Organization for Economic Cooperation and Development [OECD], 2014; Surgeon General, 2014). Worldwide, out of 34 OECD countries in 2011, 15 countries' smoking rates for adults were less than 20% and the rates have decreased by approximately one-fifth over the past ten years (OECD Factbook, 2014).

Exposure to second-hand smoke in the United States has also steadily decreased to 40.1% during 2007-2008 from 52.5% during 1999-2000 (Centers for Disease Control and Prevention [CDC], 2010b). The decreasing smoking prevalence is mainly caused by the increased adoption of smoking restrictions in public places (Arheart et al., 2008;

CDC, 2010b; Eriksen & Chaloupka, 2007; Pirkle, Bernert, Caudill, Sosnoff, & Pechacek, 2006; Surgeon General, 2014). As of the end of October 2014, a total of 69 countries and states have implemented comprehensive smoke-free legislation (American Nonsmokers Rights Foundation, 2014b). The CDC considers a smoke-free law to be comprehensive if it prohibits smoking in all indoor areas of private workplaces, restaurants, and bars. Twenty states in the United States have laws in effect that require all state-regulated gambling to be 100% smoke-free. Smoke-free casinos account for about 21% of all casinos in the United States (American Gaming Association, 2013).

Some countries and states still exempt certain indoor locations like gaming places and bars from the smoking law (Nevada Clean Indoor Air Act, 2006; New Jersey Smoke-Free Air Act, 2006; Pennsylvania Clean Indoor Air Act, 1988; Smoking Act Singapore, 1992). In Nevada, smoking in all public places is banned, but bars, casinos, strip clubs, brothels, retail tobacco stores, and restaurants that do not allow patrons under 21 years of age are exempt (Nevada Clean Indoor Air Act, 2006). Atlantic City, New Jersey, banned smoking in all enclosed workplaces, including bars and restaurants, but allowed smoking on 25% of the gaming floors (New Jersey Smoke-Free Air Act, 2006). Pennsylvania's 1988 Clean Indoor Air Act was modified to ban smoking statewide in all restaurants and other enclosed workplaces, except 25% of a casino gaming floor (Pennsylvania Clean Indoor Air Act, 2008). Indian casinos in Arizona are also exempt (Smoke Free Arizona Act, 2007). Not only inside of the United States but also outside of the country, gaming facilities are exempt from the smoking law. In Singapore, smoking prohibition was first introduced in 1970 and has been progressively extended to cover virtually all indoor places and areas where the public congregate except for casinos (Smoking Act Singapore,

1992). Instead, there are designated smoking area and non-smoking area on the gaming floor (Choong, 2013).

However, these exemptions of the gaming business from the smoke-free laws will not maintain for a long time because the smoking ban is related to public health (Goodman, Agnew, McCaffrey, Paul, & Clancy, 2007). For example, Macau implemented a smoking ban on the public gaming floors in October 2014 for the employees' and patrons' health (Stutz, 2015). Macau is the world's biggest gambling hub and the main target market is the Chinese gambler. According to OECD Factbook (2014), the smoking rate in China is 24.1% and the rate is higher than the average (21.1%) of OECD countries. In other words, if a smoking ban was implemented in Macau, the reaction of Chinese players to the smoke-free policy may be significantly negative and it can affect the casino revenue in negative way. In spite of anxiety about revenue decline and Chinese players' leaving or not caring to the casinos, Macau implemented a smoking ban for the public's health. Chinese players may move to other countries where they can smoke while gambling, such as the Philippines, Cambodia, Singapore, or South Korea.

Eriksen and Chaloupka (2007) predicted that clean indoor air laws will continue to spread throughout the United States and around the globe, where smoke-free environments will be the typical standard and smoking in indoor public areas including casinos and bars will be the rare exception.

Health Effects of Second-hand Smoke

In tobacco smoke, there are more than seven thousand chemicals; at least two hundred fifty chemicals that are known to be toxic and about seventy of which can cause

cancer (CDC, 2010a). Technically, second-hand smoke is formed from the sidestream smoke which goes into the air directly from the burning end of cigarettes or other tobacco products and from the mainstream smoke exhaled by the smoker (World Health Organization International Agency for Research on Cancer [WHO-IARC], 2004). Inhaled fresh sidestream cigarette smoke is approximately four times more toxic than mainstream cigarette smoke, so sidestream smoke is the major contributor to second-hand smoke (Schick & Glantz, 2005). Invernizzi et al.'s (2004) study showed that pollution levels of indoor places where smoking is allowed are higher than those of crowded roadways, enclosed parking garages, and during firestorms.

Second-hand smoke has been linked to a number of illnesses, lung cancer, respiratory problems, heart disease, stroke, pneumonia, and reproductive health issues (Surgeon General, 2014). Non-smokers who have never smoked are exposed to second-hand smoke at home or at work increase their risk of developing lung cancer by 20–30%. Second-hand smoke causes more than 7,300 lung cancer deaths among U.S. non-smokers each year. Non-smokers who are exposed to second-hand smoke are inhaling many of the same cancer-causing substances and poisons as smokers.

Second-hand smoke exposure is estimated to have caused 603,000 premature deaths and the loss of 10.9 million disability-adjusted life years (Öberg, Jaakkola, Woodward, Peruga, & Prüss-Ustün, 2011). The largest number of premature deaths because of second-hand smoke exposure in adults was caused by heart disease (370,000 deaths), followed by lower respiratory infections (165,000 deaths), asthma (36,900 deaths), and lung cancer (21,400 deaths) (Öberg et al., 2011). According to World Health Organization [WHO] (2014), tobacco kills approximately six million people each

year. More than five million deaths are the results of direct smokers while more than 600,000 deaths are the results of non-smokers being exposed to second-hand smoking. If urgent action is not activated, the annual death toll could rise to more than eight million by 2030 (WHO, 2014).

The exposure to second-hand smoke has steadily decreased in the United States over time (CDC, 2010b). From 1999 to 2000, 52.5% of non-smokers were found to have considerable levels of cotinine and during 2007 to 2008, 40.1% of non-smokers were measured having significant levels of cotinine. A recent finding indicated that during 2011 to 2012, 25.3% of non-smokers had measurable levels of cotinine. According to the CDC (2015), the decrease in exposure to second-hand smoke is due to several reasons, such as the growing number of state's smoking ban policies, voluntary smoke-free home rules, decline in smoking rates, and the fact that smoking has become less sociably acceptable. However, approximately 58 million non-smokers in the United States are still exposed to second-hand smoke in spite of the decline. The CDC provides some recommendations to protect non-smokers and their family from second-hand smoke exposure. People can reduce second-hand smoke exposure by not allowing anyone to smoke anywhere in them, by seeking out public areas that do not allow smoking, and by teaching their family to stay away from second-hand smoke.

Economic Costs of Tobacco Smoke

Smoking imposes a huge economic burden on society. It can cause illness in both smokers and non-smokers by exposing them to second-hand smoke. Comprehending the economic burden of smoking both in terms of monetary costs and lost time and lives can be helpful for determining how to reduce the impact on society.

Smoking exposure imposes economic burdens for the costs of direct health care and for indirect costs from reduced productivity (Adhikari, Kahende, Malarcher, Pechacek, & Tong, 2008; Behan, Eriksen, & Lin, 2005). According to WHO (2011), economic cost of smoking is defined as the cost of healthcare that occurs due to smoking and the cost that would have occurred had there been no smoking. The costs of smoking are based on an excess cost approach. Based on the conventional costs of illness approach, the economic costs of smoking classify between direct and indirect costs. Direct costs represent the monetary value of goods and services consumed as a result of smoking and smoking-attributable illness. Healthcare costs include hospitalizations, physician services, nursing home care, home healthcare, medications, and services of other healthcare providers due to the treatment of smoking-related diseases. Non-healthcare costs include those for transportation to health providers, property losses from fires that occurred because of smoking, laundry expenses, cleaning air of smoke, personnel expenses to hire and train replacements for sick workers due to smoking, and insurance premiums for fire and accident insurance. Indirect costs are losses for which no money exchanges hands, but nonetheless involve a loss of lives. Indirect costs of smoking include the value of time lost from activities due to disease and disability, and the value of lives lost from smoking-attributable illnesses (WHO, 2011).

The costs of smoking have been estimated in a number of developed western countries, such as the United States (Adhikari et al., 2008; Congressional Budget Office [CBO], 2012; Surgeon General, 2014), Canada (Kaiserman, 1997), Australia (Collins & Lapsley, 2008), and Germany (Neubauer, Welte, Beiche, Koenig, Buesch, & Leidl, 2006). Even though the smoking prevalence of adults reduced in the United States, smoking-

related health care expenditures account for about 7% of the nation's total annual health care spending (CBO, 2012). In other words, if no adults smoke, total annual health care spending would be 7% lower. Between 2000 and 2004, estimated annual direct health care expenditures and productivity losses, which were caused by smoking, were about $97 billion in the United States (Adhikari et al., 2008). Between 2009 and 2012, annual smoking-attributable economic costs in the United States estimated were between $289 and $332 billion (Surgeon General, 2014).

Other countries have conducted the economic burden of cigarette smoking. It was found that annual smoking-attributable healthcare expenses account for 6-15% of national healthcare expenditures in the high-income countries (WHO, 2011). According to WHO (2011), the total economic costs of smoking are a significant loss for the whole economy, reaching 2.1-3.4% of gross domestic product [GDP] in Australia, 1.3-2.2% of GDP in Canada, and 1.4-1.6% of GDP in the United States.

In Asian countries, a number of studies about smoking-related costs have been conducted as well, such as China (Sung, Wang, Jin, Hu, & Jiang, 2006), India (John, Sung, & Max, 2009), Vietnam (Ross, Trung, & Phu, 2007), Hong Kong (McGhee et al., 2006), South Korea (Kang, Kim, Park, Jee, Nam, & Park, 2003), and Taiwan (Sung, Chang, Wen, & Tsai, 2014). In China, researchers estimated that the smoking-attributable healthcare expense accounted for 3.1% of national health expenditures, and that the total economic cost of smoking was approximately 0.5% of GDP in 2000 (Sung et al., 2006). In India, direct medical costs of tobacco related diseases amounted to $1.2 billion and indirect costs of smoking, including the cost of caregivers and value of work loss due to illness, amounted to $502 million (John et al., 2009). In Vietnam, it was

estimated that the healthcare cost for smoking-related diseases represented 4.3% of Vietnam's total health expenditures and 0.2% of GDP in 2005 (Ross et al., 2007). In Hong Kong, it was found that the total annual costs of tobacco-related disease including direct medical costs and indirect costs are $9.4 billion including the value of lost lives in 1998 (McGhee et al., 2006). In South Korea, the estimated costs attributable to smoking ranged from $5 million to $6 million. This amount of costs was equivalent to 0.6% to 0.8% of GDP in 1998 (Kang et al., 2003). In Taiwan, total direct and indirect costs of smoking-related disease were about $1.7 billion which representing 0.4% of Taiwan's GDP and averaging about $720 per one adult smoker in 2010 (Sung et al., 2014).

Low- and middle-income countries' economic costs of smoking are lower than the costs in high-income countries (Surgeon General, 2014). However, the economic growth in many developing countries such as China and India will improve the quality of healthcare services and increase their healthcare expenses. Thus, developing countries will be confronted by a considerably higher economic burden of healthcare expenditures attributable to tobacco use in the near future if they do not adopt tobacco control policies (WHO, 2011).

The Impact of a Smoking Ban Policy

The reduced smoking prevalence is attributed to graphic warning signs, mass media campaigns, raised taxes on tobacco, less exposure to smoking in movies, and public policies like smoke-free air laws (Egan, 2013; WHO, 2013). A number of studies have found that adoptions of clean indoor air laws were increased in many countries and that increase decreased the exposure to second-hand smoke in public places (Arheart et al., 2008; CDC, 2010b; Eriksen & Chaloupka, 2007; Pirkle et al., 2006; Surgeon General,

2014). Arheart et al. (2008) investigated the cotinine levels of the United States workers exposed to second-hand smoke after adoption of clean indoor laws and found that all worker groups experienced reductions in second-hand smoke exposure between 1988 and 2002. Eriksen and Chaloupka (2007) concluded that clean indoor air laws create smoke-free environments rapidly with low costs in safe and effective ways and are well accepted by the public.

The actual evidence in adopting clean indoor air laws has confirmed the expected public health benefit in many countries. Levy, Nikolayev, and Mumford (2005) estimated that state clean indoor air laws which were implemented between 1993 and 2002 attributed to 9% of the reduced smoking prevalence. In England, a nationwide smoking ban took effect in July 2007 and attributed to the biggest fall in smoking rates (Hairon, 2008). Hairon interviewed 32,454 people before and after the ban and found that the ban had a significant effect on smoking prevalence, with a 5.5% decline in smoking in the nine months after the ban implementation, compared with a 1.6% decline in the previous nine months. Based on that result, the researchers estimated 400,000 people quit smoking as a result of the ban and 40,000 deaths were prevented over the next 10 years (Cancer Research UK, 2008). In Italy, a comprehensive national smoke-free law, banning smoking in indoor public places, went into effect in January 2005 (Martinez-Sanchez et al., 2011). The researchers confirmed that second-hand smoke exposure substantially decreased in Italy after the smoke-free legislation, as it has been observed in a number of studies in the United States, Mexico, and some European countries (WHO-IARC, 2009; Pickett, Schober, Brody, Curtin, & Giovino, 2006; Thrasher, Perez-Hernandez, Swayampakala, Arillo-Santillán, & Bottai, 2010; Thyrian et

al., 2010).

Many studies showed that comprehensive smoke-free laws, which prohibit smoking in all indoor areas of worksites and public places, including bars and restaurants, improved air quality and reduced exposure to second-hand smoke (CDC, 2014). Table 1 describes a list of peer-reviewed studies that shows the result of smoke-free laws in terms of air quality improvement. As shown in Table 1, numerous states and countries found that air quality improved. Particulate Matter [PM] 2.5 level represent the specific type of respirable suspended particulates that are assessed is 2.5 microns or less in diameter. These particles are easily inhaled deep into the lungs. They are released in large amounts when tobacco products are burned. In many states and countries, average $PM_{2.5}$ levels were reduced since the national smoke-free law implemented. In the United States, approximately an 87% reduction in $PM_{2.5}$ levels was found on average. In Canada, nearly an 85% reduction was found in Toronto and Windsor. In Europe, close to an 84% reduction in $PM_{2.5}$ levels was found (CDC, 2014).

Table 1

Reduction of PM2.5 Levels

Place	Law	Result
Delaware, U.S. (2004)	Statewide smoke-free law	91% reduction in 1 casino, 6 bars, and 1 pool hall studied in Wilmington
Hawaii, U.S. (2008)	Statewide smoke-free law	90% reduction in 15 bars and restaurants on different islands
Minnesota, U.S.(2010)	Statewide smoke-free law	76% to 95% reduction in 62 bars and restaurants studied in the Minneapolis/St. Paul
New York, U.S. (2004)	Statewide smoke-free law	84% reduction in 20 bars, restaurants, and bowling alleys studied in Western NY
Puerto Rico (2011)	Territorywide smoke-free law	88% reduction in 10 casinos studied in the San Juan metropolitan area
Puerto Rico (2010)	Territorywide smoke-free law	84% reduction in 32 restaurants and 96% reduction in 23 pubs and discos
Ontario, Canada (2010)	Provincewide smoke-free law	83% to 87% reduction in 23 coffee shops and 24 bars in Toronto and Windsor
England (2008)	National smoke-free law	96% reduction in 35 bars, nightclubs, and betting shops in 6 regions
Greece (2012)	National smoke-free law	81% reduction in 43 bars, restaurants, and cafes in 5 regions
Ireland (2007)	National smoke-free law	83% reduction in 42 pubs studied in Dublin
Ireland (2005)	National smoke-free law	75% to 96% reduction in 9 pubs studied in Galway
Italy (2005)	National smoke-free law	64% reduction in 14 bars, 6 fast food restaurants, 8 restaurants, 6 video game parlors, and 6 pubs
Scotland (2007)	National smoke-free law	86% reduction in 41 pubs
Spain (2010)	National smoke-free law	92% reduction in 178 hospitality settings in 3 regions

Note. PM = particulate matter. Adapted from "Smoke-Free Policies Improve Air Quality in Hospitality Settings," by Centers for Disease Control and Prevention, 2014. Copyright 2014 by the American Psychological Association.

Effectiveness of a Smoking Ban Policy

The earliest smoking ban policies in the United States were the 1973 law in Arizona that limited smoking in public places, the 1974 Connecticut law prohibiting smoking in restaurants, and the 1975 Minnesota law that was the first comprehensive clean indoor air law that included restrictions on smoking in private workplaces (United States Department of Health and Human Services [USDHHS], 2006). In 1995, California was the first state to adopt statewide smoke-free policies for all restaurants and this extended to bars in 1998 (Barringer, Martin, & Susman, 2006; Cowling & Bond, 2005). Local clean indoor air ordinances are spread throughout the nation (Eriksen & Chaloupka, 2007). Worldwide, in March 2004, Ireland became the first country to implement laws prohibiting smoking in enclosed workplaces, including bars and restaurants (Koh, Joossens, & Connolly, 2007). Since Ireland enacted the smoke-free policy, many countries have followed, like New Zealand, Australia, Canada, Hong Kong, and Finland (Koh et al., 2007).

The implementation of clean indoor air laws has had a positive effect on public health by reducing the proportion of non-smokers exposed to second-hand smoke from 88% in 1988-1991 down to 43% in 2001-2002 (USDHHS, 2006). To investigate the relationship between exposure to second-hand smoke and the extensiveness of the clean indoor air law, researchers analyzed the National Health and Nutrition Examination Survey data in 57 locations and compared serum cotinine levels (Pickett et al., 2006). One of the key findings of the study was that among non-smoking adults who are living in counties with smoke-free laws, 12.5% were exposed to second-hand smoke, compared with 35.1% in counties with limited smoke-free laws which exempt some places such as

bars and casinos, and 45.9% with no smoke-free laws. The New York State Department of Health also surveyed and measured levels of cotinine among non-smoking respondents before and after implementation of the 2003 New York state smoking ban in workplaces and public places, from June 26, 2003, to June 30, 2004 (CDC, 2007). The researchers found that the percentages of respondents exposed to second-hand smoke in restaurants and bars decreased significantly after the law took effect, from 19.8% to 3.1% in restaurants, and from 52.4% to 13.4% in bars.

Smoking ban policies protect non-smokers' health by decreasing exposure to second-hand smoke (Haw & Gruer, 2007). Not only do these policies achieve the goal of protecting the health of non-smokers by decreasing exposure to second-hand smoke, they also affect smoking behavior, which is related to the expected health benefits (Pierce & León, 2008). In particular, smoke-free policies affect youth and young adults by decreasing opportunities to develop a high level of nicotine addiction in people who are in the early stages of dependence (Pierce & León, 2008). Clean indoor air law implementations have had positive effects on improving public health by protecting non-smokers and workers from exposure to second-hand smoke, and by decreasing the direct costs such as medical expenses and the indirect costs such as paid holidays (Eriksen & Chaloupka, 2007).

The Impact of a Smoking Ban Policy in the Hospitality Industry

The earliest statewide comprehensive smoking ban policies in the hospitality industry took effect in California in 1995 (USDHHS, 2006). These bans expanded to Colorado and Massachusetts over the next two decades and are being applied to bars, restaurants, and other hospitality venues. According to the American Nonsmokers'

Rights Foundation [ANRF] (2014a), as of October 2012, only 15 states have laws requiring 100% smoke-free in all four types of venues (workplaces, restaurants, bars, and gaming facilities) and 36 states have laws in effect that require one of four venue types to be 100% smoke free. The exceptions of smoke-free indoors air laws are due to a fear of revenue decreases in the hospitality industry (Eriksen & Chaloupka, 2007; Glantz, 2007; WHO, 2009).

The first comprehensive study on the economic impact of a smoke-free law examined taxable sales data to determine the economic impact of smoke-free restaurant sales for a 7-year period between 1985 and 1992 in 15 California and Colorado communities (Glantz & Smith, 1994). The authors found that there was no sales increase in communities that did not have a smoke-free policy and no negative economic impact on the restaurants in communities that had banned smoking in restaurants. In a follow-up study, the authors examined the impact of smoke-free bars with full liquor licenses in five cities and two counties in California and again found that there was no significant economic impact of the local ordinances on bars (Glantz & Smith, 1997). Other numerous economic impact studies and analyses of smoke-free indoor air policies in the United States have found no negative changes for restaurants, bars, and other hospitality industries (Eriksen & Chaloupka, 2007; Glantz & Smith, 1994; WHO-IARC, 2011; Kayani et al., 2012; Levy, 2012; Pierce & León, 2008; Pyles & Hahn, 2011; Scollo, Lal, Hyland, & Glantz, 2003). Scollo and Lal (2008) collected all studies that intended to predict or assess the economic impact of smoke-free policies in the hospitality industry from 1988 to February 2008 and found that 111 of the 165 studies indicated no negative economic impact from the implementation of smoke-free policies in restaurants and bars.

Some studies though have found positive economic impacts of smoke-free laws (Boles, Dilley, Maher, Boysun, & Reid, 2010; Cowling & Bond, 2005; Glantz & Charlesworth, 1999; Hyland, Puli, Cummings, & Sciandra, 2003). In Washington, a smoke-free law was implemented in December 2005 and a study was conducted to investigate the changes in sales revenue in bars and taverns from 2002 to 2007 (Boles et al., 2010). The researchers found no immediate change in bar revenue in the first quarter of 2006, but taxable sales grew significantly after that through the fourth quarter of 2007. Sales revenues in Washington were $105.5 million during the two years after implementation of the smoke-free law and were higher than expected for bars and taverns. In California, Cowling and Bond (2005) analyzed the economic impact of the smoking ban by using tax revenue data from 1990 to 2002 and found that the 1995 smoke-free restaurant law is associated with an increase in restaurant revenues, while the 1998 smoke-free bar law is associated with an increase in bar revenues. According to Cowling and Bond (2005), smokers have relatively few opportunities to substitute alternative venues when smoking ban policies are implemented and bars and restaurants increase revenues by attracting more non-smokers. Glantz and Charlesworth (1999) investigated hotel revenues as a share of total retail sales revenues in three states and six cities that had adopted smoke-free restaurant policies and concluded that there was no adverse impact on the hotel, while finding a statistical increase in revenues in several hotels. Hyland et al. (2003) looked at hotel and restaurant revenues and employment of the impact of local smoke-free policies in New York State and showed that sales and employment stayed constant or increased in the year following the implementation of the regulations.

On the other hand, Clower and Weinstein (2004) found that the Dallas smoking ban ordinance contributed to a decline in alcohol sales and restaurants revenue. In Dallas, a smoking ban in restaurants, hotels, bingo halls, and bowling centers took effect in March 2003, so the findings are short-term effects. In New York, Ridgewood Economic Associates (2004) argued that the New York state smoking ban impact was a loss of 2,650 jobs, $50 million in worker earnings, and $71.5 million in gross state product. Similarly, Adda, Berlinske, and Machin (2007) collected a sample of 2,724 pubs and investigated the impact of the smoke-free policy in Scotland, United Kingdom and found that the Scottish smoking ban led to a 10% decrease in reported sales and a 14% decrease in the reported numbers of customers. This studies were done for a short time period after the smoke-free laws were implemented so further research is needed for the long run impact (Adda et al., 2007).

The Impact of a Smoking Ban Policy in the Casino Industry

While smoking bans are being legislated worldwide and throughout the United States, gaming venues continue to be exempt from these laws. These exemptions are allowed because of the possible economic impact of smoking bans on the casino industry and the subsequent economic impact on the community (Pritsos, Pritsos, & Spears, 2008).

Public health advocates argue that smoking bans are essential because non-smokers have the right to be protected from second-hand smoke. Smoking bans employ different effects on different businesses. Some will be unaffected while others will experience losses or gains (Craven & Marlow, 2008). Businesses with a greater proportion of smoking customers can expect that smoking bans will impact a negative economic impact (Craven & Marlow, 2008). Most previous empirical literature shows

that smoking bans do not exert harm in restaurants and bars in the United States. However, casino management has argued that the revenue impact of a smoking ban in casino is quite different from other part of the hospitality industry since casino gamblers tend to smoke more than the general population (Garrett & Pakko, 2010).

Smoke-free policies in casinos are likely to have a greater negative impact on revenue than the bans on restaurants and bars, since customers patronize casinos for a longer time than they do restaurants and bars (Garrett & Pakko, 2010). Most smokers can tolerate smoking for a couple of hours in restaurants and bars. Otherwise, smokers can go outside to smoke and this may not affect visit times. In contrast, gamblers may be very inconvenienced by leaving a casino to smoke and this may cause them to make shorter visits, take business to jurisdictions where smoking is legal, or even stay at home (Barringer et al., 2006).

The first statewide ban to gaming facilities was Delaware's Clean Indoor Air Act, which passed on November 27, 2002, and went into effect in racinos in November 2003 (Mandel, Alamar & Glantz, 2005). Mandel et al. conducted a study of the Delaware smoking ban impact on gaming revenue and found that there was no effect on slot machine-like video lottery terminals gaming revenue. However, Pakko (2006) corrected Mandel et al.'s data and methodologies errors like heteroskedasticity and seasonality and found that revenues declined 13% after the implementation of the Delaware smoke-free law.

Thalheimer and Ali (2008) evaluated the slot coin-in at three Delaware racinos after a smoking ban and the monthly coin-in data was analyzed using seemingly unrelated regression and includes seasonal variables. The result showed that the smoking

ban affected gaming volume in a negative way and the decline in coin-in ranged from 12.7% to 17.8%. Garrett and Pakko (2010) used multiple regression analysis and included independent variables for seasonality, general economic conditions, policy changes, and weather to evaluate the impact of a smoking ban in Illinois casinos. Likewise, the results showed the smoking ban was related to a 22% revenue decline. In Victoria, Australia, smoke-free laws commenced in gambling venues in September 2002 and Lal and Siahpush (2008) examined the impact of the smoking ban policy. Lal and Siahpush used interrupted time series analysis and autoregressive integrated moving average modeling. The researchers found that monthly electronic gaming machine revenue decreased 13.8% after the ban. For these reasons, casino management worries that smoking bans would force their smoking customers to leave and reduce the smoking customers' staying time at the gaming area.

Kansas City, Missouri, passed its indoor smoking ban in 2008 and implemented a statewide ban in June 2008 (Kansas City Business Journal, 2008). According to the policy, smoking is not be allowed in any Kansas City bar or restaurant but continues to be allowed on the city's two casino gaming floors until casino smoking is banned in surrounding counties because of casino operators' concerns about potential loss of gaming revenue (Kansas City Business Journal, 2008). The Nevada Clean Indoor Air Act (2006) also exempts gaming facilities. In 1991, the Silver City casino on the Las Vegas Strip, owned by Circus Circus Enterprises, banned smoking to attract non-smoking gamblers and after three years of declining revenues, the Silver City allowed smoking again (Barringer et al., 2006). The Silver City's smoking ban failure on the gaming floor is cited within the industry as the evidence that smoking ban policies are not

economically viable for casinos, and it may cause casinos to be reluctant to adopt the policy (Barringer et al., 2006).

The National Institute of Economic and Industry Research (2000) discovered that there is no difference between the proportion of smokers and non-smokers who play slot machines in Victoria, Australia, but smokers spent $30.29 per capita compared to $13.93 of non-smokers' expenditure. In other words, there is no evidence that smokers are more likely to play slot machines than non-smokers, but if smokers play, they spend twice as much as non-smokers.

If smoking is prohibited in the gaming area, smoking gamblers have to stop playing the game while taking a break to smoke and that breaks a player's concentration (Harper, 2003). Further, while smoking gamblers are taking a break, they may think about the gambling expenditure, think the gambling is a waste of money, and then leave the casino (Harper, 2003). Therefore many casino managers are reluctant to adopt a smoking ban on the gaming floor since the policy may result in decreased revenues.

Meanwhile, numerous gaming venues have adopted smoking restrictions in response to market demand. Non-smoking hotel rooms are common at casino resorts because guests request them (Barringer et al., 2006). Smoking is banned not only in hotel rooms, but also in non-gaming areas, such as restaurants, shopping malls, and movie theaters where families and children are likely to come together. A notably successful experience with casino smoking restrictions is the Bellagio Resort in Las Vegas, which has banned smoking in a high-stakes poker room because poker players demanded it (Barringer et al., 2006). Casino patrons demand for non-smoking gaming environments

will continue to grow as fewer people smoke and public attitudes toward smoking change (Barringer et al., 2006).

Customers' Attitude to a Smoking Ban Policy

Response to a Smoking Ban Policy

In several countries, it is indicated that a smoking ban in workplaces, public transportations, or public places are widely supported by the general people (Borland et al., 2006). Borland et al. examined the prevalence of smoking bans across four different countries, the United States, Canada, the United Kingdom, and Australia. The results revealed the psychosocial and behavioral effects of smoking bans in restaurants and bars. According to Borland et al., a support for bans in both restaurants and bars were related to the existence of bans, beliefs about second-hand smoking being harmful, and lower average cigarette consumption. Among smokers, a support for smoking bans was associated with living in a place where the law prohibits smoking. Smokers adjust and both accept and comply with smoke-free laws. Smokers' support for smoking bans and compliance with those bans are remarkably similar across countries given the notably different levels of smoke-free policies. Across the four countries, smoke-free restaurants were much more common than smoke-free bars, so support for smoke-free bars was far lower, even where bans are in place. Borland et al.'s study concluded that comprehensive smoke-free policies, once implemented, would attract support from smokers and compliance would be high.

There are numerous studies showing that smokers tend to be supportive of smoking restrictions in public places. In the United Kingdom, a study was conducted to investigate the public attitudes to the 2006-2007 smoking bans in enclosed public areas

and workplaces. It was found that 79.1% were supportive of the ban, 14.6% opposed the ban, and 6.2% were unsure (Dockrell, Delacy, Morrison, Buchanan, & Lewis, 2010). An opinion poll in New South Wales, Australia, indicated that 89% of respondents were supportive of the smoke-free policy for children's playground, 77% for sports facilities, 72% for bars, 69% for outdoor dining, 55% for beaches, and 55% for cars carrying children (Walsh, Paul, Tzelepis, Stojanovski, & Tang, 2008). In the country of Georgia, 84.9% of participants supported smoking restrictions (Bakhturidze, Mittelmark, Aarø, & Peikrishvili, 2013). In all demographic segments, including tobacco smokers, the majority of respondents indicated agreement with smoking bans, ranging from a low of 51% in the 13–25 age group to a high of 98% in the 56–70 age group. Logistic regression with all demographic variables showed that agreement with restrictions was comparatively higher with age, and also was significantly higher those who never smoked as compared to daily smokers.

In Thailand, a smoking ban in hotel lobbies was issued in 2006, causing significant anxiety in the hospitality industry (Viriyachaiyo & Lim, 2009). Viriyachaiyo and Lim found that a smoking ban in air-conditioned hotel lobbies was strongly supported by tourists in Thailand. The researchers concluded that the smoking prohibition in the hotel lobby is likely to make Thailand more attractive as a tourist destination.

The public opinion that supports legislation restricting the use of tobacco is an important component when a government and casino operator makes a decision whether to implement a smoke-free policy (Bakhturidze et al., 2013). Behaviors of smokers and

non-smokers affect their compliance with the smoking ban policies and are important indicators of the success of such policies (Pederson, Bull, Ashley, & Lefcoe, 1987).

Psychological Reactance Theory

The theory of psychological reactance is that persuasive communication is sometimes experienced as a potential threat to freedom (Brehm & Brehm, 1981). According to the theory, if individuals feel that any of their free behaviors are eliminated or threatened with elimination, the individual reacts negatively and are motivated to restore that freedom. Since the purpose of a smoking policy is usually to restrict smoking, negative reactions are likely to be fostered by the perceived existence of a smoking policy among pro-smoking individuals who think freedom to smoke is relatively more important (Bloom, Smoot, Shore, & Shore, 1991). People are likely to restore the eliminated freedom by directly doing the restricted behavior (Brehm, Stires, Sensenig, & Shaban, 1966). People may reestablish the eliminated freedoms indirectly by increasing affection for the threatened choice (Brehm et al., 1966), by derogating the source of threat (Smith, 1977), or by denying the existence of the threat (Worchel, Andreoli, & Archer, 1976).

The psychological reactance theory provides a framework to understand the choice between negative responses and adjustment to specific policies (Brehm & Brehm, 1981). This theory explains that smoking ban policies on the gaming floor are perceived as threatening the individual's freedom to choose among behavioral alternatives and the policies may have strong resistance by people who have strong attitudes toward the polices (Wiium, Aarø, & Hetland, 2009).

The theory of psychological reactance explains why attempts to persuade people not to smoke may have the opposite effect. As predicted by reactance theory, high threat

policies were evaluated more negatively and prompted greater intentions to smoke than low threat policies (Wiium et al., 2009). Psychological reactance theory also explains why limited or removed freedoms seem more attractive (Fogarty, 1997). Behaviors perceived to be prohibited for certain people are more attractive to people for whom the restriction applies (Bushman & Stack, 1996). Additionally, attributing the warning to a highly authoritative source increases this forbidden fruit effect (Bushman & Stack, 1996).

Changes of Attitudes and Patronage Behaviors

Some studies have found that the general population has changed their attitudes and behaviors towards environmental tobacco smoke before and after smoke-free policy implementations. Tang et al. (2003) studied for the first time the acceptance of and compliance with a statewide smoke-free bar law among patrons after a smoke-free bar law went into effect. Tang et al. found that bar patrons' attitudes to the smoke-free bar law turned positive as time went on. There may be a snowball effect in which people who become familiar with a smoke-free indoor environment in all enclosed public area such as workplaces and restaurants cannot tolerate the exposure to environmental tobacco smoke (Tang et al., 2003).

In Massachusetts, the rate of support for smoke-free restaurants increased from 37.5% to 59.8%, with similar increases among current, former, and never smokers from 1992 to 1999 (Brooks & Mucci, 2001). In Denmark, Lykke, Helbech, and Glümer (2014) examined the temporal changes in public attitude towards smoking bans in public places from 2007 to 2010 and found that the public's attitude towards smoking in public areas changed in a positive way after the implementation of a comprehensive smoking ban. The greatest relative increases were seen for restaurants and bars (39 % increase)

followed by workplaces (24 % increase). Lykke et al. (2014) concluded that this change in attitude can support implementation of future legislation on smoking and may lead to positive changes in smoking norms.

In addition to the hospitality patronage, it has been studied that casino patronage is also significantly affected by smoking bans. Smokers are more likely to smoke while gambling because smoking rates are higher among gamblers than non-gamblers (Smart & Ferris, 1996). Smokers and non-smokers have different attitudes regarding smoking ban policies (Ashley et al., 2000). Non-smokers are significantly more likely to support smoking bans than smokers (Ashley et al., 2000). In Ashley et al.'s study, 71% of non-smokers are supportive of a smoking ban in family fast food restaurant, while only 47% of smokers are supportive. Both smokers and non-smokers are least supportive of bans in bars and taverns, with 18% and 3% respectively.

There are some studies on customers' attitudes changes in restaurants. Smokers are less likely to dine out than non-smokers if a smoking ban implements (Biener & Siegel, 1997; Bojanic, 1996; Corsun, Young, & Enz, 1996). Roseman (2005) found that non-smokers were more likely to think second-hand smoke was a problem and would choose a restaurant based on a smoke-free environment. The smoke-free policies do not impact hospitality venues in a negative way any more because many people are already accustomed to the smoke-free restaurants that were implemented in the early 1990s (McNabb & Hearns, 2005).

Among smokers and non-smokers, there are individual differences (Bloom et al., 1991). For example, non-smokers who think an individual freedom to smoke is more important than public health may react to a smoking ban policy differently from those

who think opposite way. Smokers who think public health is more important than the freedom to smoke may react differently from those who think health is less important. Some smokers change their patronage when a smoking ban is implemented in casino while others continue their patronage behaviors. Non-smokers behave likewise because the importance of the behavioral freedom is different within the smoker or non-smoker group (Bloom et al., 1991).

Smokers have been categorized according to their nicotine dependence and frequency of cigarette consumption as "Reluctant", "Easy-going", and "Adamant" (Poland et al., 2000). Similarly, non-smokers are in three groups, which are "Laissez-faire", "Un-empowered", and "Adamant". Poland et al. (2000) conclude in the study that identification and consideration of the types of smokers and non-smokers in the general population and distinguishing characteristics provide recommendation strategies to support a smoking ban implementation. Willson (2005) also argued that the classification of smokers and non-smokers into distinct sub groups based on their attitudes towards smoking and smoking bans is important to reduce the opposition to smoking restrictions. By recognizing the differences in behaviors in each sub group, it becomes easier to predict each sub group's behaviors if a smoking ban is implemented.

Current Trends of Smoking Ban in South Korea

South Korea has one of the highest smoking prevalence with 22.9% of a daily smoking rate in 2012 compared with other OECD countries with the average rate is 21.1% (OECD Factbook, 2014). In particular, male's smoking prevalence is as high as 40.8%, which is higher than the 27.2% OECD average, whereas females' smoking rate is 5.2% that is lower than the 15.4% OECD average. The National Health Plan 2020 [HP 2020]

is the third national health promotion plan ever launched since the national health promotion law was enacted in 1995 and the HP 2020 aims to decrease males' smoking rate to 29% by the year of 2020 (Ministry of Health and Welfare, 2011). To achieve this, South Korea's government has doubled the cigarette price from 2,000 Korean Won to 4,000 Korean Won at the start of 2015 (Ministry of Health and Welfare, 2015). In addition, the South Korea's government wants to force cigarette manufacturers to print picture warnings of the harm caused by smoking on the cover of cigarettes and any kind of tobacco advertising is banned to lower the smoking rate.

The smoke-free policy in South Korea has designated public places like schools, hospitals, public transportation, and buildings as smoke-free areas, since the implementation of the National Health Promotion Act in Korea in 1995 (Ministry of Health and Welfare, 2010). As of 2013, the National Health Promotion Act included restaurants larger than $150m^2$ to smoke-free areas and expanded to restaurants larger than $100m^2$ on January 1, 2014. As of January 1, 2005, all restaurants prohibit smoking regardless of the size. However, the smoking ban exempts entertainment venues such as karaoke bars, traditional bars, pubs, and casino facilities where smoke-free policies are urgently needed (Park et al., 2013).

Researchers evaluated the effect of tobacco control policies on smoking prevalence in South Korea and estimated that the tobacco control policies such as tax increases, a media campaign, and smoking ban policies are attributed to the reduction in smoking rates (Levy, Cho, Kim, Park, Suh & Kam, 2010). It was estimated that increasing the cigarette tax by an additional $0.47 (Korean Won 500) can further reduce the smoking rate by 7% and that rigorous clean indoor air act laws, a comprehensive

marketing ban, and a comprehensive cessation policies program can reduce smoking rates. If these policies are all combined, smoking rate can decline by 25% from the current level (Levy et al., 2010).

A Smoking Ban in Kangwonland Casino

As of 2014, there are 17 casinos in South Korea. Sixteen of those are foreigners-only casinos and Kangwonland casino is the only gambling place, in which the entry of local Korean nationals is permitted legally (Korea Casino Association, 2014). Kangwonland casino is the largest and most profitable casino in South Korea with 200 table games (20 in the members-only gaming area and 180 in the public gaming area) and 1,360 slot machines (Korea Casino Association, 2014). It opened October 28, 2000, with 30 table games and 480 slot machines. The initial facilities were planned for a capacity of 700 people, but recorded 3,200 visitors in average per day (Kangwonland, 2001). Due to overcrowding, Kangwonland casino expanded the gaming facilities in March 2003 and June 2013.

Kangwonland banned smoking partially on the public gaming floor by designating a non-smoking table games area in 2004 because non-smoking players requested a protection from environmental tobacco smoke [ETS]. In January 2005, Kangwonland casino expanded the smoking ban to the whole public gaming area. This smoking ban policy was voluntarily done to protect patrons and employees from ETS (Kangwonland, 2006). To accommodate the gamblers who wish to smoke in the casino, six smoking rooms were installed and there are no gaming facilities inside the smoking rooms. The smoking rooms with high functioning ventilation system are located inside

the casino building, so players do not need to leave the building to smoke. The members-only gaming area with 20 table games is still exempt from the smoking ban.

Theoretical Model and Hypotheses

As stated in chapter one, the primary objectives of this study are (1) to evaluate the impact of a smoking ban policy on gaming volume, and (2) to determine how the implementation of a smoking ban at a single property influenced customers' satisfaction. This study focuses on evaluating the economic impact of a smoke-free policy on table games drop and slot machine coin-in and gamblers' satisfaction toward a smoke-free policy according to the smoking status.

Several studies designed to estimate the impact of a smoking ban have utilized a modeling approach that is applicable to the process of estimating the impact of a smoking ban on gaming volumes. This study follows previous literature by capturing the economic impact of a smoking ban using a dummy variable in a multiple linear regression equation that includes controls for trend, seasonality, and changes in environments such as ski resort open. Casino gaming volume data tend to have a linear trend over time due to seasonality, economic cycles, or other factors.

Figure 1 presents a conceptual model that depicts proposed influences on table games drop and slot coin-in, including the impact of a smoking ban policy. With the exception of the smoking ban variable, the specification of this model is clearly derived from the literature reviewed herein.

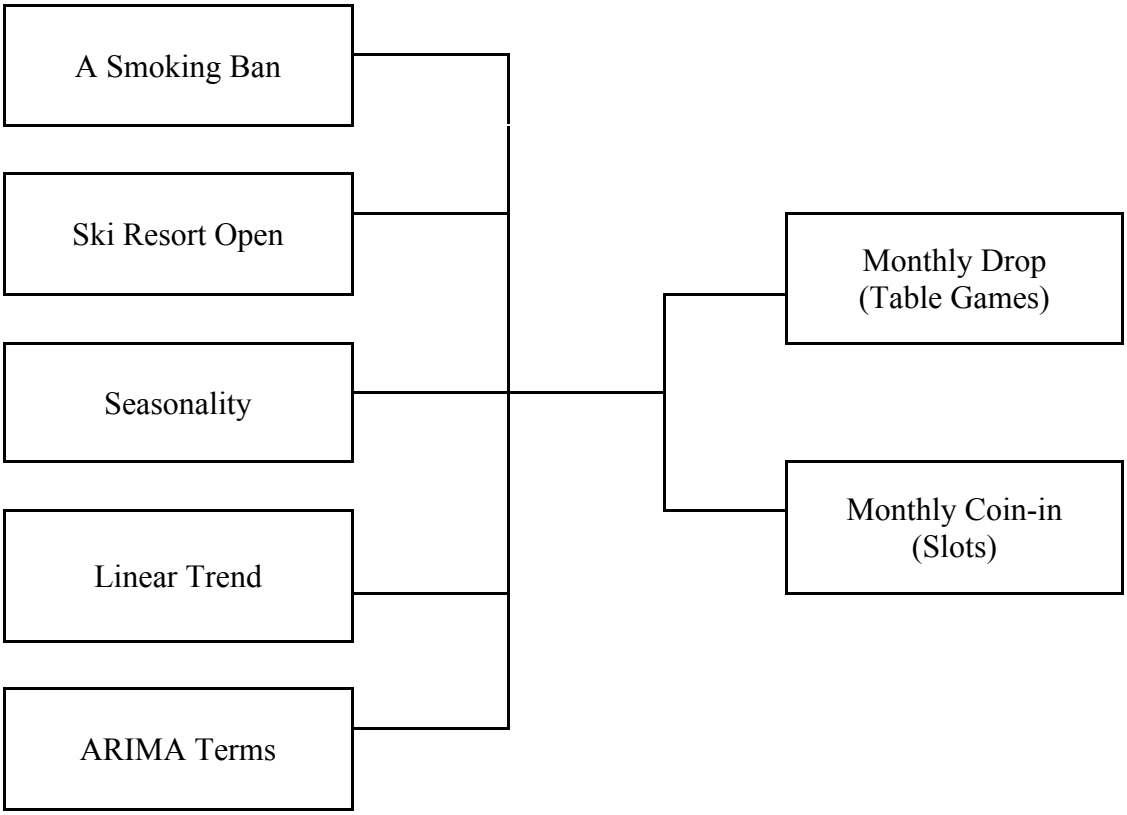


Figure 1. Theoretical model designed for monthly drop and coin-in.

The model presented in Figure 1 represents the core variables that the earlier studies found to be effective predictors of table games drop and slot coin-in. A separate equation specifies each of the two criterion variables, that is, table games drop and slot machine coin-in. A smoking ban on the gaming floor may influence casino revenue negatively since gamblers have to stop the game while smoking or leave to another casino that allows smoking. Casino gamblers smoke more than the general population and customers stay for a longer time in casino (Garrett & Pakko, 2010) so the impact of a smoking ban policy in the casino industry may be different from the impact in other hospitality venues such as restaurant and bars. Therefore, the alternative hypotheses 1A and 1B were proposed one-tailed test.

Both the null and alternative hypotheses related to the key variable are listed below.

$H1A_0$: ßsb ≥ 0

$H1A_A$: ßsb < 0

In $H1A_0$ and $H1A_A$, ßsb represents the regression coefficient for a smoking ban variable in the model designed to test monthly table games drop.

$H1B_0$: ßsb ≥ 0

$H1B_A$: ßsb < 0

In $H1B_0$ and $H1B_A$, ßsb represents the regression coefficient for a smoking ban variable in the model designed to test monthly slot machine coin-in.

Hypothesis 2 is supported by the psychological reactance theory. According to the theory, players who smoke react negatively if a casino implements a smoking ban policy. Since a smoking ban policy restricts smoking, smokers think that the freedom to smoke is restricted (Bloom et al., 1991). In addition, non-smokers and smokers may respond differently toward a smoke-free environment since non-smokers are more likely to support a smoking ban than smokers (Ashley et al., 2000). The null and alternative hypotheses 2 are stated as:

$H2A_0 \leq 3$

$H2A_A > 3$

In hypothesis 2A, non-smoking gamblers satisfaction was tested and 3 represents a neutral response in the Likert-type scale satisfaction survey.

$H2B_0 \geq 3$

$H2B_A < 3$

In hypothesis 2B, smoking gamblers satisfaction was tested and 3 represents a neutral response in the Likert-type scale satisfaction survey.

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

This chapter begins with data collection procedures. Descriptions of the sample in this study will be presented in the data collection part. Then data analysis methods will be followed. Last, the time series regression model will be discussed to test hypothesis 1A and 1B, and a non-parametric test will be presented to test hypothesis 2A and 2B.

Data Collection

Secondary data for the study was collected from Kangwonland's casino operation department with permission of headquarters. The data is monthly data for 122 periods from April 2003 to May 2013. This period range avoids the changes of the number of table games and slot machines. Kangwonland casino expended the facilities before April 2003 and after May 2013. During the data collection period, there was no change in the number of gaming facilities that may affect gaming volume. Kangwonland casino implemented a smoking ban in the public gaming area in January 2005 and a ski resort opened in December 2006. This study used table games drop and slot machine coin-in as dependent variables. The concept of drop as a measure of total casino activity represents the total amount of wagering activity for table games (Greenless, 2008) and table games drop is the appropriate indicator for analysis of gaming demand (Gu, 1999). Unlike table games, slot machines include meters that indicate the total amount wagered in the machine. As cash or slot tickets are inserted, the coin-in meter advances and maintains a cumulative total for all cash wagered into the machine (Kilby, Fox, & Lucas, 2005). This

coin-in feature allows management to monitor exactly what percentage the machine is winning, called hold percentage, and then compare that percentage with the game's theoretical win percentage (Kilby et al., 2005). These two measures represent the least biased gaming volume indicators obtained by casinos (Suh & Lucas, 2011).

To address the second research question, another secondary data set was used. Kangwonland casino management conducted a survey to investigate customers' satisfaction of the smoke-free gaming environment approximately one and a half years after the policy implementation. Slot machine attendants and pit clerks collected the questionnaires on the gaming floor while gamblers were not playing on a break. Participants answered demographic characteristics (age, gender, and visit frequency), the smoking state, and Likert-type scale questions from 5-very likely to 1-very unlikely, with 3 representing a neutral response. The survey was conducted for four days from May 13, 2006 to May 16, 2006. A total of 790 respondents participated in the survey.

Data Analysis

The table games drop and slot machine coin-in data were screened in R, an open source statistical software package, to ensure accuracy of data entry, missing values, distribution normality, and fit of the models. Plot graphs of aggregate monthly table games drop and slot machine coin-in were evaluated for occurrences of seasonality. The formal data analysis was also conducted using R, which allows for the user to address the serial correlation of error terms that is often present in time series data analysis. The hypotheses were initially tested via simultaneous multiple regression analysis at the .05 alpha level. Following hypotheses testing, the regression model was tested for assumptions via assessments of diagnostics and error-term scatter plots. Because these

diagnostic tests determined the standard regression model was unfit for the data, autoregressive integrated moving average [ARIMA] analysis was run on the data set, and further diagnostic tests were administered to ensure the new model was appropriate for the data set.

In addition, non-parametric test was conducted to determine if smoking gamblers were not satisfied with a smoking ban policy and if the non-smoking gamblers were satisfied with a smoking ban policy on the gaming floor. The responses were measured on a Likert-type scale ranging from 5-very satisfied to 1-very unsatisfied, with 3 representing a neutral response.

Table 2

Hypotheses and Test Type

Hypothesis	Test type	Independent Variable	Dependent Variable
1A	ARIMA	A smoking ban Ski resort Seasonality	Table games drop
1B	ARIMA	A smoking ban Ski resort Seasonality	Slot coin-in
2A	Non-parametric test	Smoking status	Customers' satisfaction
2B	Non-parametric test	Non-smoking status	Customers' satisfaction

Time Series Regression Model

Kangwonland implemented a smoking ban policy on the public gaming floor in January 2005. A ski resort started business in December 2006 and operates only for the winter season, which is December, January, and February. Dummy variables are also included for each month to account for potential timing differences. Overall, the regression equation used in this study is;

$$Yi = \beta_0 + \beta_1(\text{Trend}) + \beta_2(\text{SmokingBan}) + \beta_3(\text{SkiOpen}) + \sum_{\beta 4}^{\beta 14}(\text{Month}) + \varepsilon$$

Where:

Yi = Kangwonland table games drop and slot coin-in in millions Korean Won

β = Coefficients for each predictor variable

Trend = Time varying characteristics of gaming volume

SmokingBan = Dummy variable coded as "1" for the smoke-free environment period and "0" otherwise

Ski Open = Dummy variable coded as "1" for the opening of a ski resort season and "0" otherwise

Month = Control dummy variable for each month from February to December

ε = Error term

Dependent Variables. Table games drop represents the monthly Korean Won value of all cash and checks purchases of gaming chips produced by players in all public table games in Kangwonland casino. Kangwonland casino does not issue gaming markers or chips to table game players via credit. Kangwonland gamblers can buy gaming chips only with cash or checks at the tables. Therefore all table games drop in Kangwonland represents all the money in the drop box. Likewise, coin-in represents the

total monthly Korean Won amount of wagers produced by all slot players. Alternatively stated, coin-in is the aggregate monthly Korean Won-value of all slot wagers.

Korean consumer price index [CPI] is used to adjust economic series for table games drop and slot machine coin-in value changes and to translate these series into inflation-free Korean Won. The CPI is the most commonly used measure of inflation and is viewed as an indicator of the effectiveness of government economic policy (United States Department of Labor, 2001). Inflation has been defined as a process of continuously rising prices and continuously falling value of money. The CPI is generally the best measure for adjusting the money value in an earlier period at today's value.

Independent Variables. The key variable in the model of this study was expressed in a binary format. It means that the months on which the smoking ban was implemented were assigned a value of "1". In other words, each month, from January 2005 through May 2013, the smoking ban variable was set to "1", while each month prior to January 2005 the smoking ban variable was set to a value of "0".

The control variables represented any variable theorized to influence the dependent variable, aside from the key variable. In this thesis, any other variable thought to influence the monthly gaming volumes would be considered a control variable. Ski resort open in Kangwonland resort was created to be a control variable since the ski resort open variable was determined to have a significant influence on the number of casino visitors from the previous literature review. According to Lee (2010), the number of visitors was a significant component of table games drop model in the Kangwonland casino sample. If the month is one of December, January, and February after December 2006, the ski resort open variable was set to a value of "1", otherwise "0".

The correction variables were represented by the ARIMA terms. In this thesis, monthly table games drop and slot machine coin-in data were used to test hypothesis. Typically, observations that measured the same variable at regularly different time points are often correlated, which may cause multicollinearity problems. To address of serial correlation in the error process, the ARIMA model was employed.

ARIMA Models. Time series data is usually observations made or measurements taken at regularly spaced intervals and the result of a consistent underlying mechanism and error (Box, Jenkins, & Reinsel, 2008). Time series data is many observations of one subject through time. Stationary time series is crucial for the application of time series modeling. In terms of correlation structure, stationarity means that the impacts of past observations decrease quickly in time. One of the simple ways for handling non-stationary data is the autoregressive model and the moving average model (Box et al., 2008). According to Box et al., combining autoregressive and moving average models can achieve greater flexibility when describing time series data. A common form of these is the ARIMA model. The models are designed as ARIMA (*p, d, q*) models. The order of the autoregressive component is represented by parameter *p*, the order of integration by *d*, and the order of the moving average component by parameter *q*. The integration parameter *d* addresses non-stationary series. When the trend variable is incorporated in the model, *d* equals zero.

Typically, time series is considered to use if the data is recorded in equal-interval time points such as daily, monthly, or yearly. The use of an ARIMA model in time series analysis is an effective method to investigate the seasonal variation and trend pattern. In

addition, an ARIMA model is the best model for representing the correlations in the data (Box et al., 2008).

Initial plotting involves visual inspection for anomalies and possible patterns, and non-stationary behavior. Autocorrelation function [ACF] and partial autocorrelation function [PACF] further help in the solving on non-linearity. When the data is stationary, the ACF and PACF graphs suggest appropriate ARIMA models based on remaining significant correlation between lags. When residuals were autocorrelated, ARIMA model was fitted until the autocorrelation problem was addressed.

ARIMA model is a specific form of regression that is often employed when using data points over time. There are four assumptions to use of linear regression models: normality, homoscedasticity, no multicollinearity, and independence. Diagnostics were run on the final model residuals to determine if they meet model assumptions. These diagnostics include Q-Q plots to investigate marginal normalcy, the graph of the standardized residuals vs. the standardized fitted values for homoscedasticity check, VIF for multicollinearity check, and ACF and PACF for linearity check.

Non-parametric Test

Non-parametric tests are knows as distribution-free test since the tests do not assume that the result is normally distributed. In other words, non-parametric tests can be used without assuming the data follows a normal distribution. If the data to be analyzed by a one-sample *t* test come from a population whose distribution violates the assumption of normality, the *t* test may provide misleading results. In such cases, using a non-parametric test may provide a better analysis. To test whether the Kangwonland survey data is likely from a normal distribution, the Shapiro-Wilk test was employed. The

Shapiro-Wilk test provides a generally superior measure of non-normality (Shapiro & Wilk, 1965). The Shapiro–Wilk test uses the null hypothesis to check whether a sample came from a normally distributed population. The null hypothesis of this test is that the population is normally distributed. Thus if the *p* value is less than the .05 alpha level, then the null hypothesis is rejected and there is evidence that the data tested are not from a normally distributed population. In other words, the data are not normal. This condition qualifies to conduct a non-parametric test. On the contrary, if the *p* value is greater than the .05 alpha level, the null hypothesis that the data came from a normally distributed population cannot be rejected. For the one-sample *t* test, the most common non-parametric alternative test is the Wilcoxon one-sample signed rank test. Once the violation of normal distribution was found in the customers' satisfaction survey model, the Wilcoxon one-sample signed rank test is employed.

Conclusion

The hypotheses concerning whether a smoking ban decreases casino gaming volume were tested using time series regression analysis. In the time series regression model, dependent variables are table games drop and slot machine coin-in. The predictor variables are seasonality, the smoking ban policy, and the opening of a ski resort. The hypotheses concerning whether smoking gamblers are not satisfied with the smoking ban policy and whether non-smoking gamblers are satisfied with the smoking ban policy were tested using a non-parametric test. The next chapter presents the results and analysis of the model.

CHAPTER 4

RESULTS

Introduction

This study used two secondary data sets, which were Kangwonland casino gaming volume data (table games drop and slot machine coin-in) and customers' satisfaction survey data. In this chapter, a description of the data analysis based on the methodology provided in the Chapter 3 will be provided. First, the assumptions for the tests will be addressed. And then data screening of gaming volume and survey results will be shown and descriptive statistics will be followed. Next, the regression models will be tested and then the non-parametric test of the survey will be conducted.

Assumptions

There are four principal assumptions which justify the use of linear regression models for purpose of inference; normality, homoscedasticity of the errors, multicollinearity of the relationship between dependent and independent variable, and statistical independence of the errors.

First, the assumption of normality of residuals is tested by evaluating the Q-Q plots. Figure 2 presents the Q-Q plots for table games drop and Figure 3 presents the Q-Q plots for slot coin-in. Q-Q plots were reviewed to investigate marginal normalcy and the linearity of the points suggested that the data were normally distributed both in drop and coin-in. There does not appear to be any serious departures from normality for any of the models.

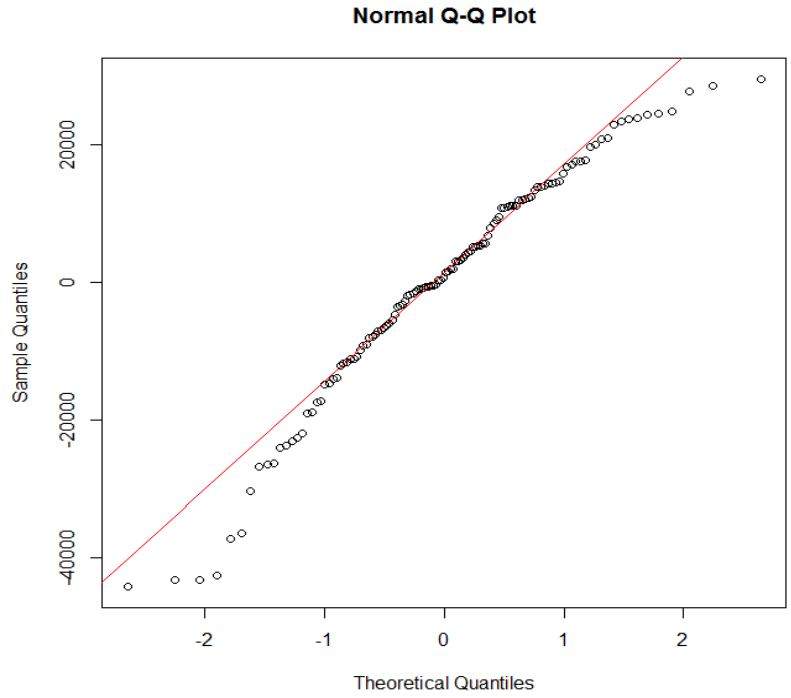


Figure 2. Q-Q plot of the standardized residuals for drop.

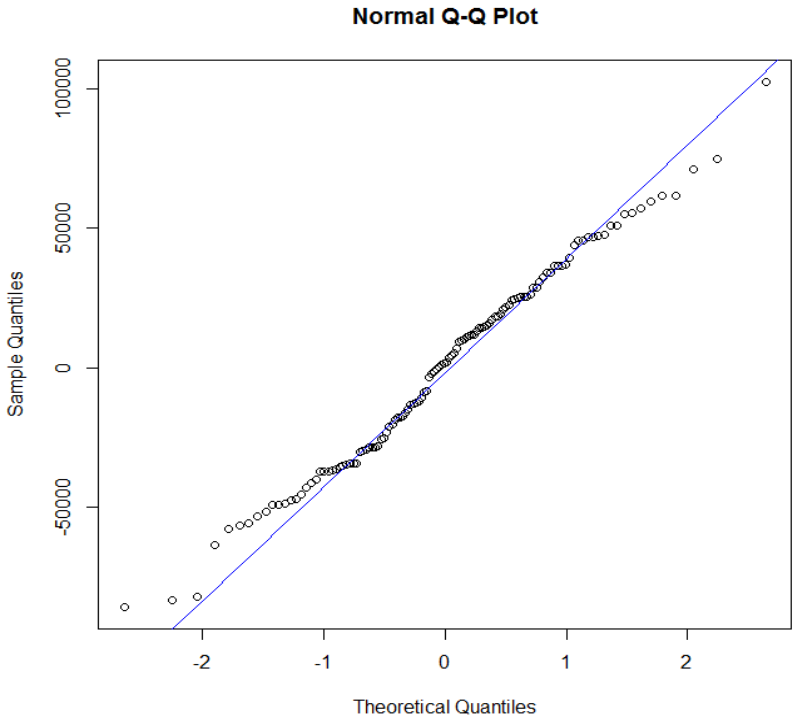


Figure 3. Q-Q plot of the standardized residuals for coin-in.

Second, the data is checked for homoscedasticity. Homoscedasticity means that the variance of errors is the same across all levels. The points should be evenly distributed around the mean. The assumption is checked by visual examination of a plot of the standardized residuals by the regression standardized fitted value. Figure 4 shows the graph of the standardized residuals vs. the standardized fitted values for table games drop and Figure 5 shows for slot coin-in. The homogeneity of variance assumption is supported to the extent that the vertical scatter is the same across all x values. As shown in Figure 4 and 5, the red line has a curved pattern that has two reversals showing up, indicating a violation of homoscedasticity. This condition suggests the inclusion of three additional variables in the final model, "t", "squared t", and "cubed t".

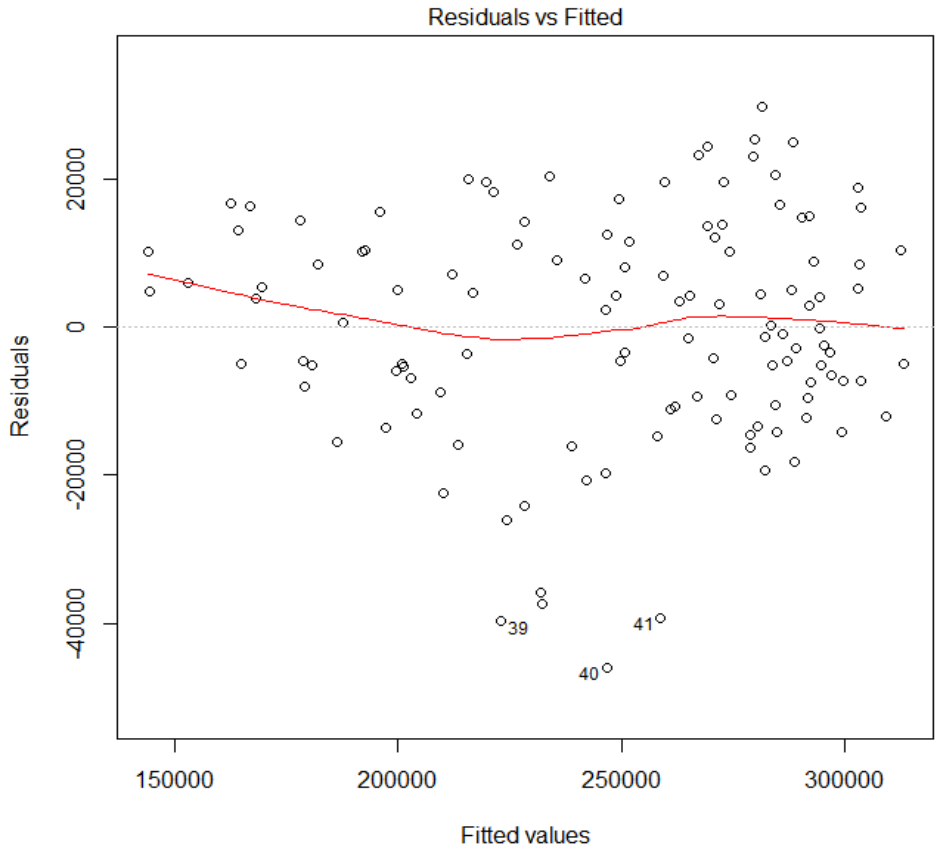


Figure 4. Scatterplot of the standardized residuals vs. standardized fitted value for drop.

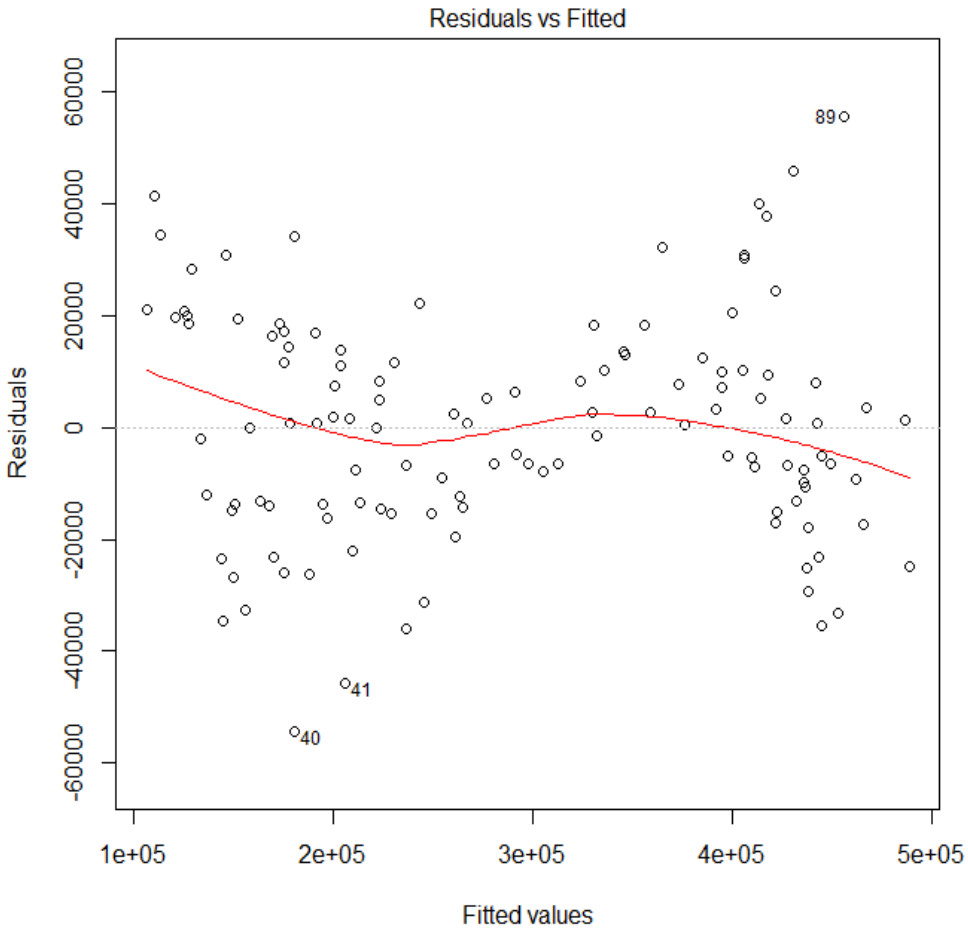


Figure 5. Scatterplot of the standardized residuals vs. standardized fitted value for coin-in.

Third, multicollinearity is checked by analyzing variance inflation factors [VIF] for table games drop and slot coin-in. The VIFs for each independent variable are given in Table 3. Since VIF of "t" (276.87), "squared t" (1071.90), and "cubed t" (341.41) were high, "standardized t" (("t" – mean of "t")/standard deviation of "t"), "squared standardized t", and "cubed standardized t" were used to reduce the VIF values instead of "t", "squared t", and "cubed t". In typical, a VIF above 10 is considered an indicator of multicollinearity (Kutner, Nachtsheim, Neter, & Li, 2005).

Table 3

Variance Inflation Factors

Variable	VIF
Standardized Trend	6.78
Standardized Trend^2	2.82
Standardized Trend^3	9.24
February	1.84
March	2.73
April	2.84
May	2.85
June	2.70
July	2.71
August	2.71
September	2.72
October	2.73
November	2.74
December	1.86
Smoking Ban	5.67
Ski Open	3.39

Last, the assumption of independence is verified by reviewing the autocorrelation function [ACF] and partial autocorrelation function [PACF] graphs on the final model. The significant autocorrelation for several time lags and slow decline indicate non-stationarity. Time series data tends to violate independence assumptions of a linear regression model since the value of the monthly drop observed at any given time t may depend of values observed at other points in time. Figure 6 indicates the ACF and PCAF of the residuals for table games drop and Figure 7 shows for slot coin-in. A screening of the ACF and the PACF revealed serial correlation. To address this problem, an autoregressive integrated moving average [ARIMA] model was employed.

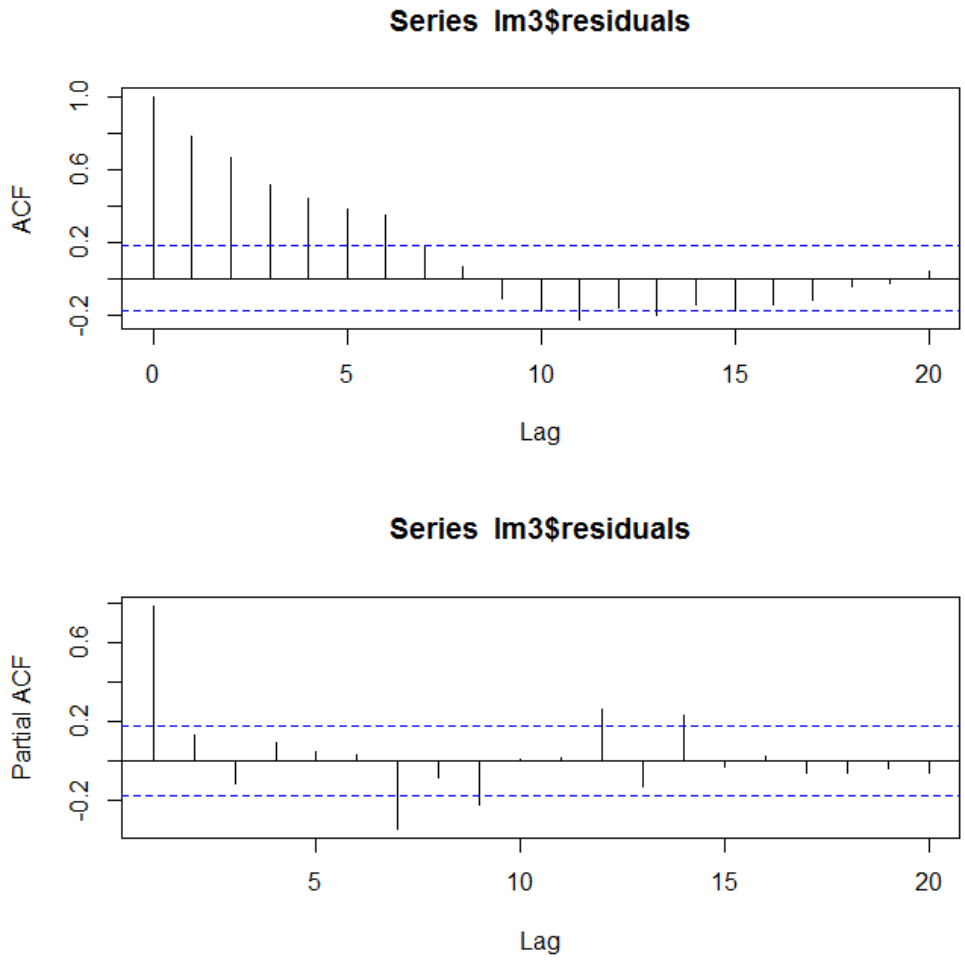


Figure 6. ACF and PACF of the residuals from the drop regression model.

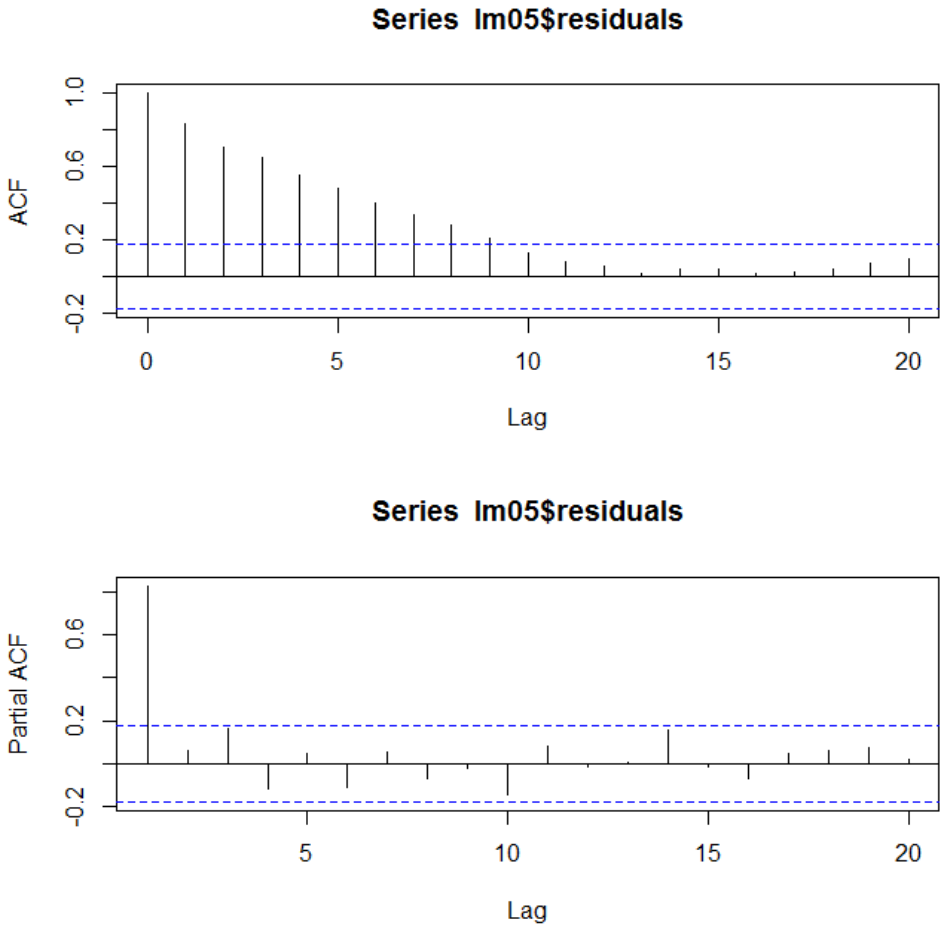


Figure 7. ACF and PACF of the residuals from the coin-in regression model.

In addition, to test hypothesis 2 in this study, an assumption about the data should be met for employing one-sample t-test. All parametric statistics have an assumption that the data come from a population that follows a normal distribution. Figure 8 shows the Q-Q plots and histogram of non-smokers' satisfaction. Figure 9 shows the Q-Q plots and histogram of smokers' satisfaction. As shown in Figure 8 and 9, the data violated a normal distribution. Thus, non-parametric test was employed.

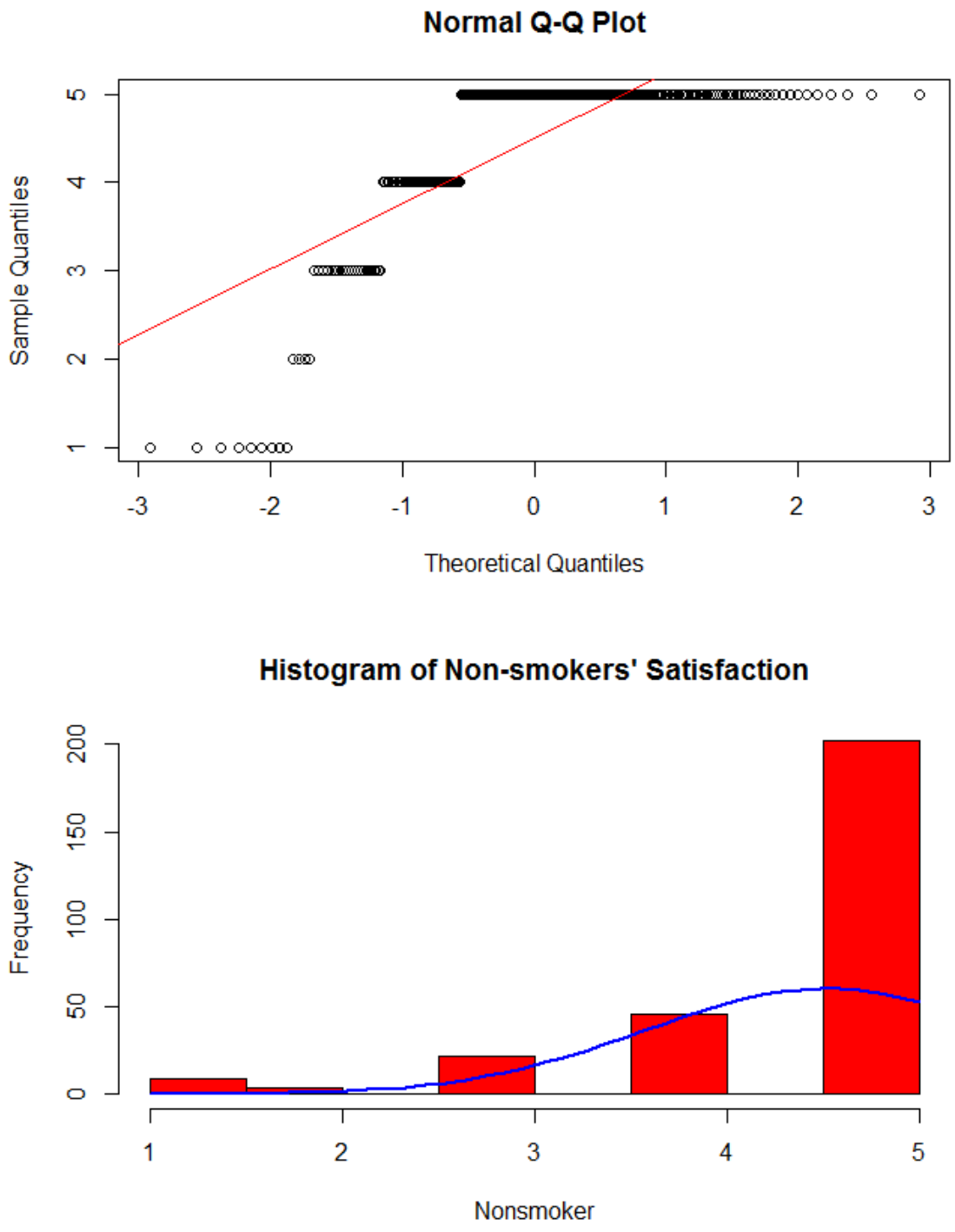
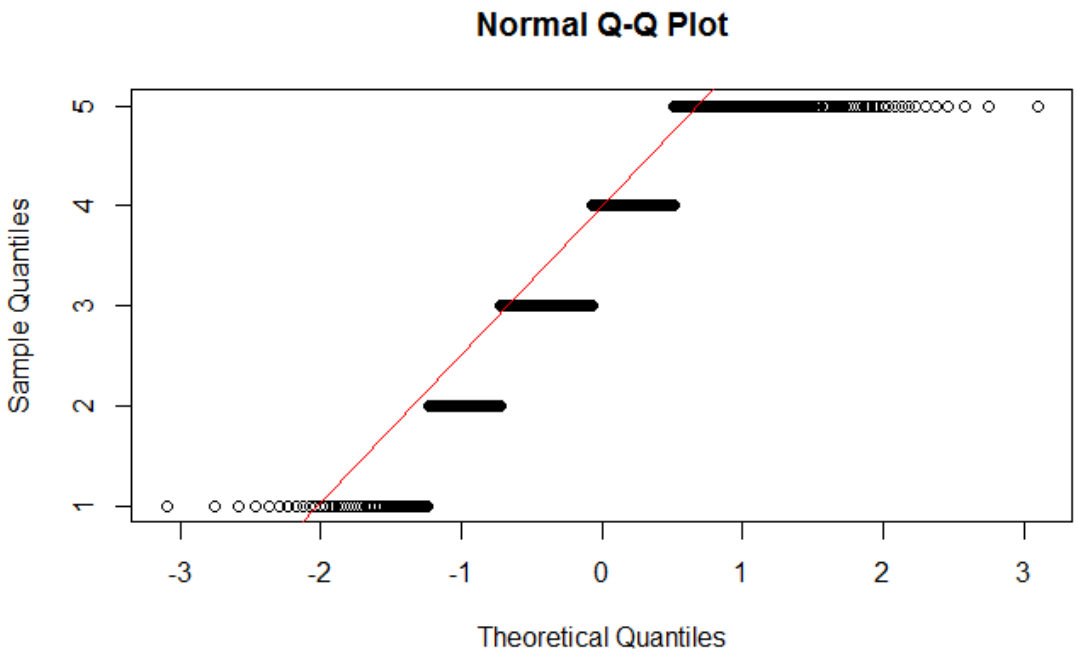


Figure 8. Q-Q plot and histogram of non-smokers' satisfaction.

Note. The responses were measured on a 5 point Likert-type scale ranging from 5-very satisfied to 1-very unsatisfied.



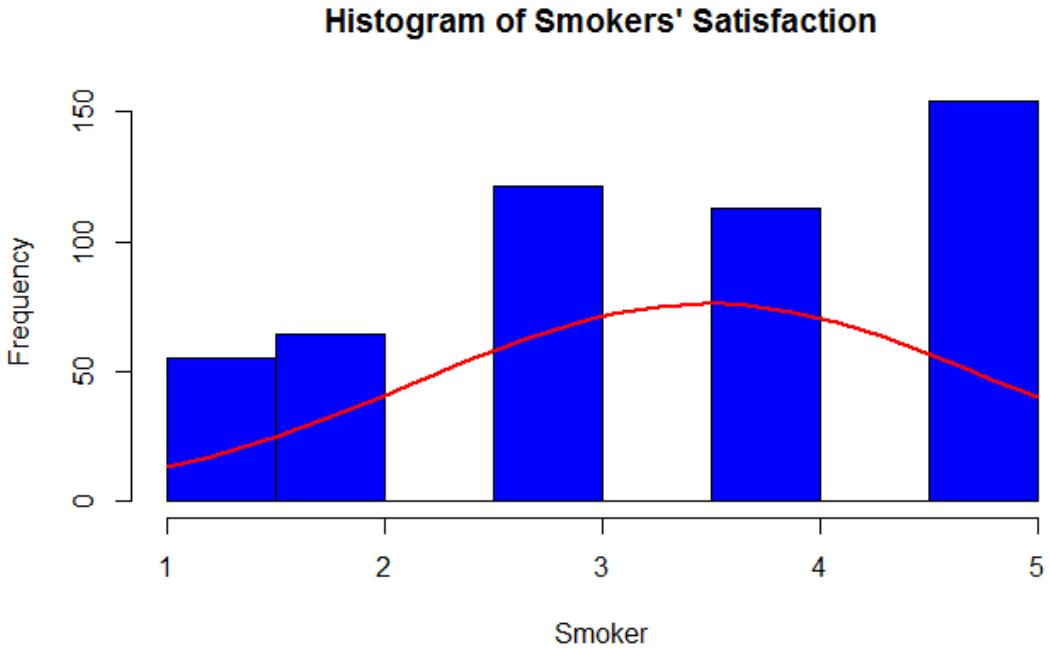


Figure 9. Q-Q plot and histogram of smokers' satisfaction.

Note. The responses were measured on a 5 point Likert-type scale ranging from 5-very satisfied to 1-very unsatisfied.

Data Screening

The graphs in Figure 10 and 11 were examined to determine if the structure of the data varied by time and if a time series model needed to be employed. Plots of the dependent variables on the first data set, table games drop and slot coin-in, were reviewed to assess its basic structure. An examination of the plot is necessary to the time series modeling process since the plot is used to visually determine the stationarity of the dependent variable series (Pindyck & Rubinfeld, 1998). Figure 10 describes monthly table drop. As can be seen in Figure 10, it appeared that the data had both seasonality and a trend over time. The seasonality was adjusted by including monthly dummy variables already discussed in the model. The plots indicate the presence of a cubic trend that has two reversals.

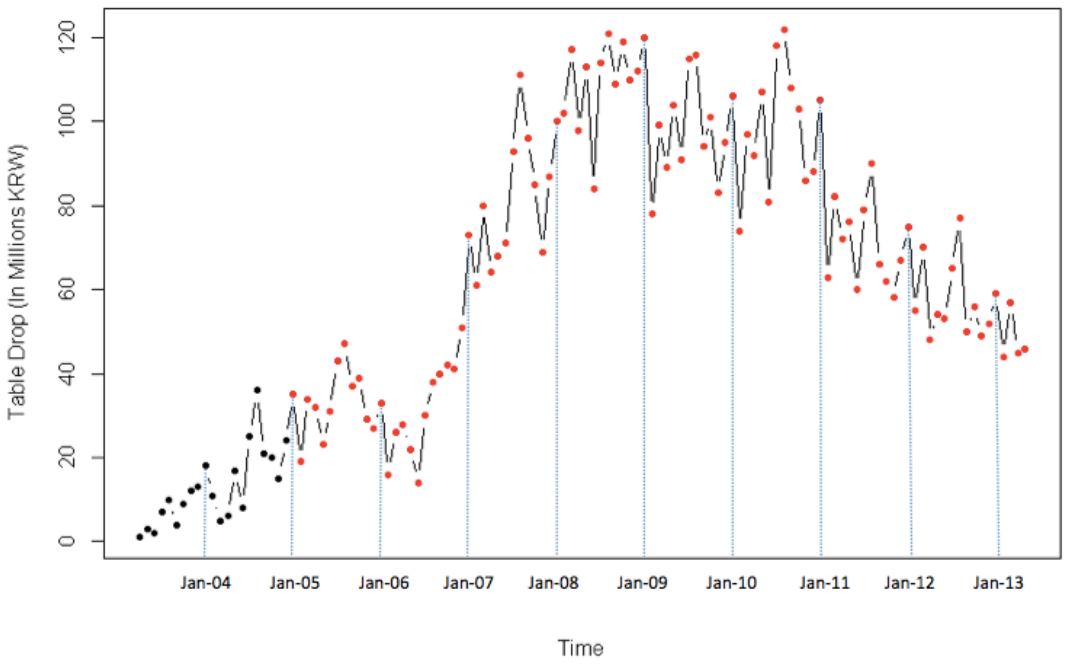


Figure 10. Plots of monthly table drop.

Note. For April 2003 – May 2013. In millions of 2010 real Korean Won. Red dots indicate a smoking ban.

Figure 11 describes monthly slot coin-in plots. As can be seen in Figure 11, it also appeared that the data had both seasonality and a trend over time. Likewise, the seasonality was adjusted by including monthly dummy variables. The slot coin-in plots indicate a decrease from March 2004 to June 2006, follow by a steady increase from then to August 2010, and steadily decrease from then (Figure 11).

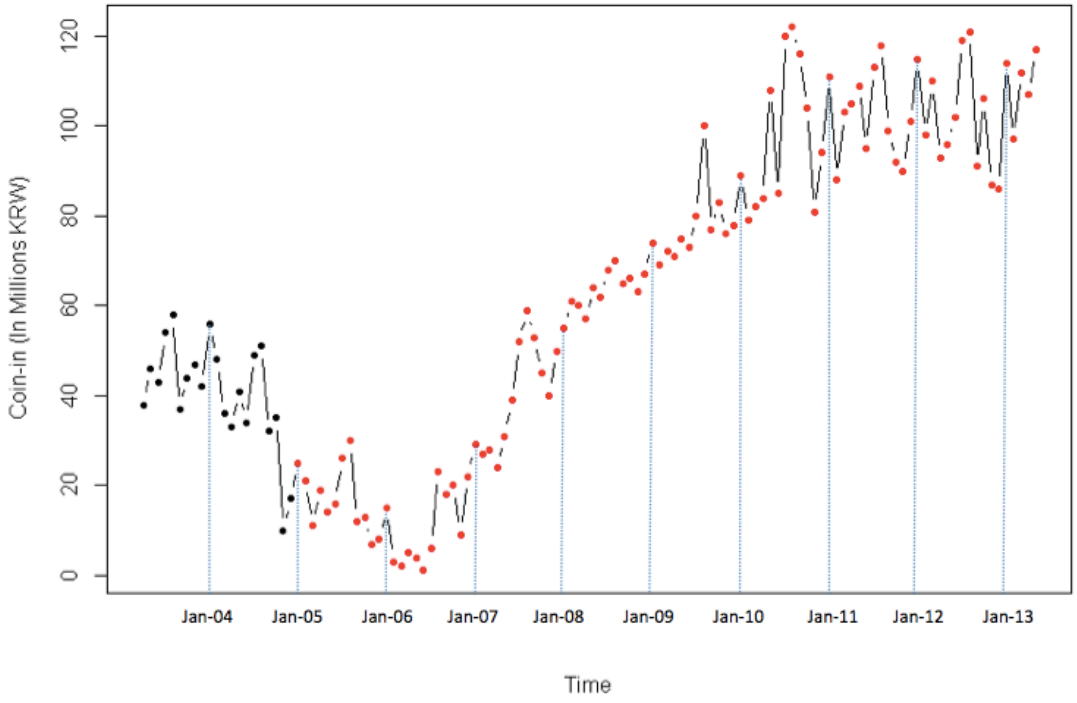


Figure 11. Plots of monthly slot coin-in.

Note. For April 2003 – May 2013. In millions of 2010 real Korean Won. Red dots indicate a smoking ban implementation.

These conditions both in table drop and slot coin-in justified the adoption of ARIMA model. The models were run with standardized t, squared standardized t, and cubed standardized t.

Descriptive Statistics

Gaming Volume Data

The descriptive statistics shown in Table 4 describe the dependent variables, which are table games drop and slot machine coin-in, on monthly basis. Monthly table games drop has a mean of 248,700 million Korean Won [KRW] and a standard deviation of 46,572 million KRW. Monthly slot machine coin-in has a mean of 291,000 million KRW and a standard deviation of 118,116 million KRW.

Table 4

Descriptive Statistics (N=122)

	Min	Max	*M*	*SD*
Table Games Drop	149,300	323,100	248,700	46,572
Slot Coin-in	110,100	511,900	291,000	118,116

Note. In millions of 2010 real Korean Won.

Kangwonland Survey Data

Kangwonland conducted a survey to investigate gamblers' satisfaction toward a smoking ban policy on the gaming floor one year after the smoking ban policy implementation. A total of 790 gamblers participated in the survey and all respondents were over the age of 20 since the survey was conducted inside of the gaming area in Kangwonland. Table 5 presents the demographics of the participants by smoking status.

As shown in Table 5, a little more than 73.4% of the respondents were males and about 26.6% of the respondents were female. Nearly 74.1% of male respondents were smokers and 25.9% of male respondents were non-smokers. In contrast, approximately 36.7% of female participants were smokers and 63.3% of female participants were non-

smokers. Age of the participants was categorized into four segments, 20-29, 30-39, 40-49, and over 50. The majority age group was in the age range between 40 and 49 years old, representing roughly 34.2%. Almost 30.1% were between 30 and 39 years old and 25.8% were over 50 years old. The minority age group was between 20 and 29 years old, which represented about 9.9%. In all age groups, there was a higher proportion of smokers than non-smokers. Older age groups also represented a higher proportion of smokers. The number of casino trips in the past year was categorized into five segments. The majority of players visited Kangwonland casino over 41 times during the past year, representing nearly 36.2%, and the next largest visit time group was in the group of 11 to 20 times a year, representing 24.7%. The minority of players visited from 21 to 30 times, representing 9.5%. Overall, almost 64.2% of participants were smokers and about 35.8% of participants were non-smokers.

Table 5

Demographics by Smoking Status (N=790)

Response	Smoking Status				Total	%
	Smoker		Non-smoker			
	n	%	*n*	%		
Gender						
Male	430	74.14	150	25.86	580	73.42
Female	77	36.67	133	63.33	210	26.58
Total	507	64.18	283	35.82	790	100.00
Age						
20-29	40	51.28	38	48.72	78	9.87
30-39	153	64.29	85	35.71	238	30.13
40-49	167	61.85	103	38.15	270	34.18
Over 50	147	72.06	57	27.94	204	25.82
Total	507	64.18	283	35.82	790	100.00
Casino Trips						
Less than 10 times	84	55.26	68	44.74	152	19.24
11-20 times	122	62.56	73	37.44	195	24.68
21-30 times	46	61.33	29	38.67	75	9.49
31-40 times	62	75.61	20	24.39	82	10.38
More than 41 times	193	67.48	93	32.52	286	36.20
Total	507	64.18	283	35.82	790	100.00

Formal Data Analysis

Table Games Drop Model

Once the data was screened and the descriptive statistics were reviewed, the models were specified and the regression analyses were performed. All control variables that were not significant in the first regression model were removed and the model was rerun and only the final model was analyzed. Monthly variables for March, April, May, July, September, October, and December were removed from the model since they were not significant. The ski resort open control variable was also not significant and hence removed.

As a result of linear regression assumption test, the violations of the assumptions were found. To address this problem, ARIMA model was employed. Based on Figure 6, PACF cuts off abruptly after lag 2 and ACF declines in geometric progression from its highest value at lag 1 in table games drop model. It justifies to employ ARIMA (2, 0, 1) model in the table drop.

Table 6 presents the regression results for the table games drop model with an R^2 of 87.31% and adjusted R^2 of 86.53%. The final regression model produced F (7, 114) = 112, $p < .001$. With no VIFs greater than 3.79, problematic multicollinearity did not appear to be an issue. Consequently, the smoking ban variable produced no significant effect for a one tailed test since the null hypothesis is that there is a non-negative relationship between a smoking ban and table games drop. With the p value over .05 alpha level, the null hypothesis 1A is not rejected.

Table 6

Regression Results of Table Games Drop

	VIF	*B*	SE	*t*	*p*
Constant		274100	13403	20.450	.000 ***
Standardized Trend	2.62	28180	6288	4.481	.000 ***
Standardized Trend^2	2.16	-29036	6000	-4.839	.000 ***
February	1.03	-11473	2432	-4.716	.000 ***
June	1.03	-10226	2435	-4.199	.000 ***
August	1.03	19850	2434	8.154	.000 ***
November	1.03	-14092	2431	-5.796	.000 ***
Smoking Ban	3.79	5813	9118	0.638	>.500
AR(1)		-0.108	0.041	-2.643	.000 ***
AR(2)		0.889	0.041	21.901	.000 ***
MA(1)		0.965	0.029	32.994	.000 ***

Note. $N = 122$. SE = standard error. All coefficients are expressed in millions of 2010 real Korean Won. ***$p < .001$, two-tailed.

To test whether appropriate ARIMA terms are fitted, ACF of residuals and the associated p-values by the Ljung-Box test were reviewed. Figure 12 shows the ACF of residuals and the Ljung-Box test results of slot coin-in. As can be seen in Figure 12, there is no instance of problematic serial correlation in the table games drop.

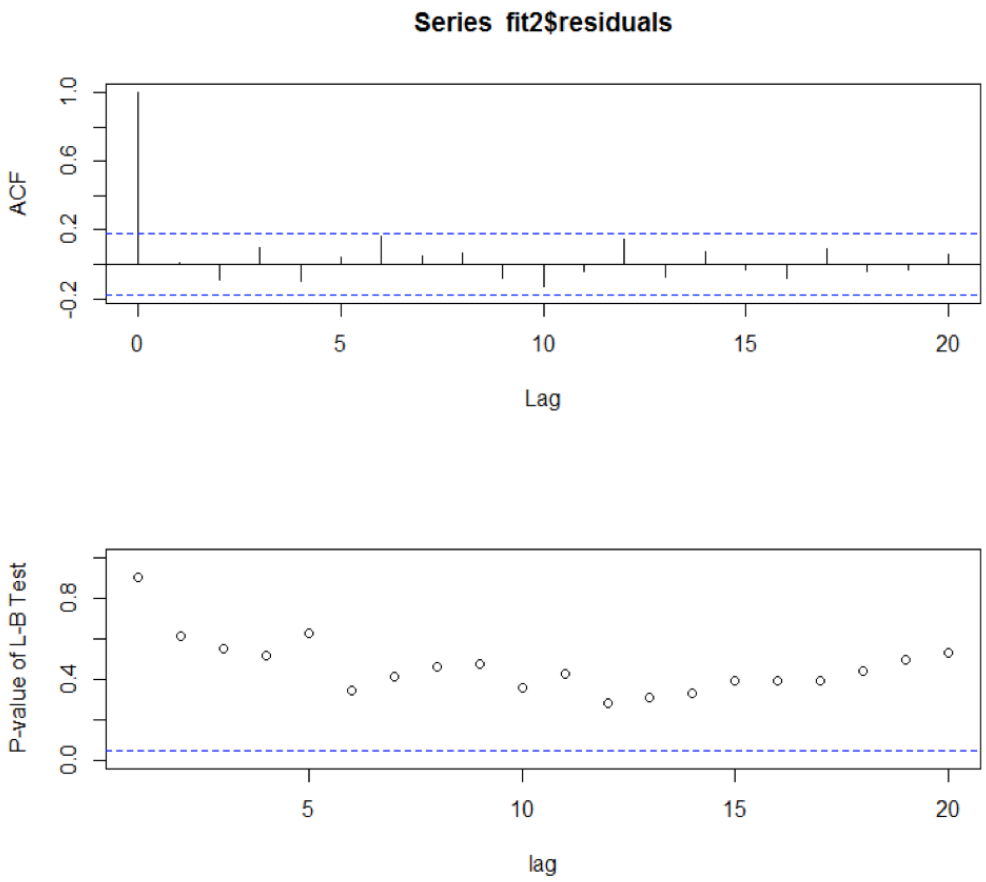


Figure 12. ACF and Ljung-Box test result of table drop.

Slot Machine Coin-in Model

Based on the coin-in data screening and descriptive statistics, the models were specified and the regression analyses were performed. All control variables that were not significant in the first regression model were removed and the model was rerun and only the final model was analyzed. Monthly variables for May and July were removed from the model since they were not significant. The ski resort open control variable was also not significant and hence removed.

It was found violations of linear regression assumption in slot coin-in model. To address the problems, ARIMA model was also employed. Based on Figure 7, PACF cuts off abruptly after lag 1 and ACF dies out so ARIMA (1, 0, 1) model was employed for coin-in model. Table 7 presents the regression results for the slot coin-in model. The

final regression model produced R^2 of 90.11% and adjusted R^2 of 89.02%, both substantially high and F (12, 109) = 82.77, p <.001. With no VIFs greater than 3.85, problematic multicollinearity did not appear to be an issue in the final coin-in model. Consequently, the smoking ban variable produced no significant effect for a one tailed test. With the p value over .05 alpha level, the null of hypothesis 1B is not rejected.

ACF of residuals and the associated p-values by the Ljung-Box test were also reviewed to test whether appropriate ARIMA terms are fitted. Figure 13 shows the ACF and Ljung-Box test results of slot coin-in. As shown in Figure 13, there is no instance of problematic serial correlation in the slot coin-in.

Table 7

Regression Results of Slot Coin-in

	VIF	*B*	SE	*t*	*p*
Constant		296730	41818	7.096	.000 ***
Standardized Trend	2.64	81493	20672	3.942	.000 ***
February	1.22	-21448	4283	-5.008	.000 ***
March	1.22	-14432	4577	-3.153	.000 ***
April	1.23	-20401	4254	-4.796	.000 ***
June	1.22	-21815	3844	-5.676	.000 ***
August	1.22	25753	4597	5.602	.000 ***
September	1.22	-19707	5121	-3.848	.000 ***
October	1.22	-18531	5289	-3.504	.000 ***
November	1.22	-41307	5135	-8.044	.000 ***
December	1.22	-29781	4626	-6.437	.000 ***
Smoking Ban	3.85	-11674	15444	-0.756	.225
AR(1)		0.973	0.019	52.290	.000 ***
MA(1)		-0.265	0.098	-2.711	.007 **

Note. N = 122. SE = standard error. All coefficients are expressed in millions of 2010 real Korean Won. **p < .01, two-tailed. ***p < .001, two-tailed.

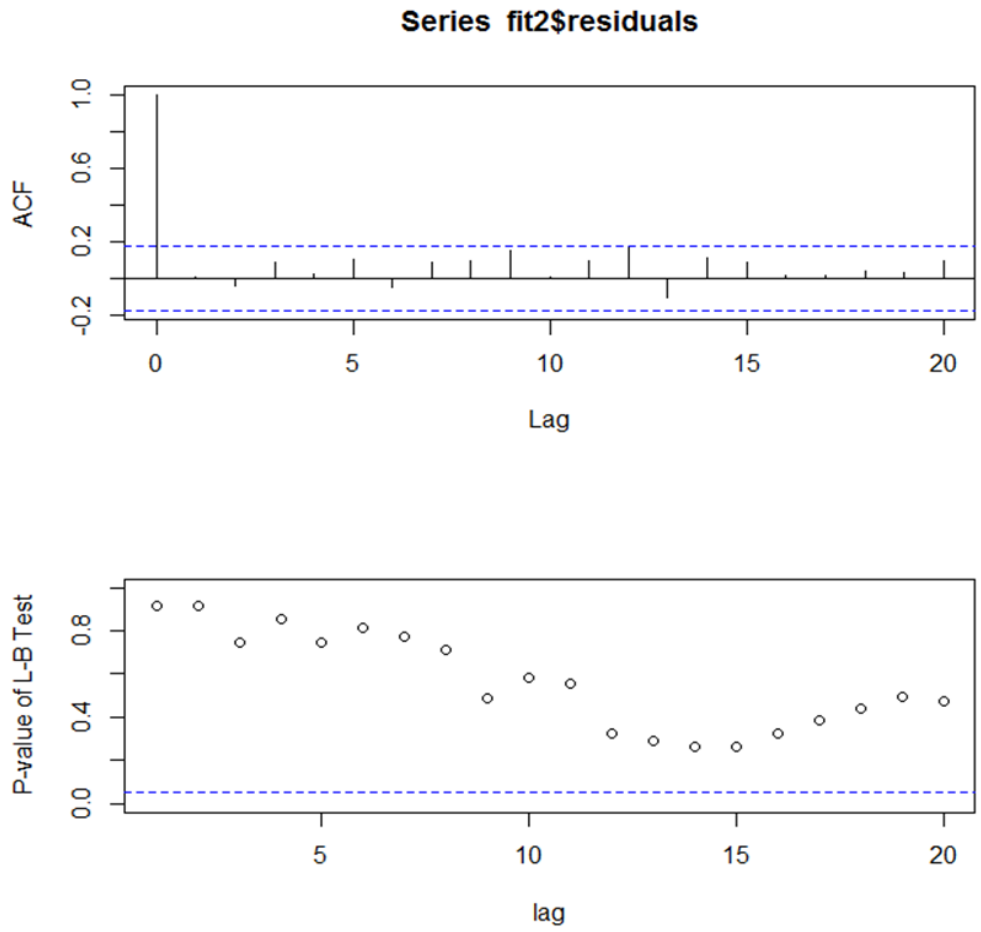


Figure 13. ACF and Ljung-Box test result of coin-in.

Kangwonland Survey Model

The results of the survey, which were conducted to evaluate customers' satisfaction toward the smoking ban in Kangwonland casino, are shown in Table 8. Females are more satisfied (M=4.56) with the smoke-free environment than males (M=3.6). Younger age groups are shown to be more satisfied with the smoking ban policy than older age groups. Often visited customer groups show lower satisfactory scores compared with rarely visited customer groups. Overall, casino players in Kangwonland were satisfied with the smoke-free policy, since the average score of all respondents was over 3.

Table 8

Customers' Satisfaction Survey Result

	M	*SD*
Gender		
Male	3.60	1.39
Female	4.56	0.82
Age		
20-29	4.23	1.17
30-39	4.06	1.26
40-49	3.87	1.18
Over 50	3.44	1.43
Casino Trips		
Less than 10 times	4.15	1.10
11-20 times	4.26	0.94
21-30 times	4.23	0.85
31-40 times	3.94	1.20
More than 41 times	3.30	1.52
Smoking Status		
Non-smoker	4.51	0.94
Smoker	3.49	1.33
Total	3.85	1.30

Note. Satisfaction number indicates satisfaction score. For example, 5-very satisfied, 4-satisfied, 3-neutral, 2-unsatisfied, and 1-very unsatisfied.

Table 9 describes the results of the normality test and the non-parametric test. As can be seen in Table 9, the Shapiro-Wilk test results indicate a *p* value of less than .05 for

both the non-smoker group and smoker group. In other words, the data is not normally distributed. This condition qualifies to conduct a Wilcoxon one-sample signed-rank test, which is one of the non-parametric statistical hypothesis tests. As a result of the Wilcoxon signed-rank test for H2A (non-smokers' satisfaction), the null hypothesis can be rejected since *p* value is less than .05 ($p < .001$). On the contrary, a result of the test for H2B (smokers' satisfaction) supports that the null hypothesis should not be rejected since *p* value is greater than .05 alpha level ($p = 1$). In other words, the alternative hypothesis that smokers would not be satisfied with a smoking ban is rejected.

Table 9

Non-parametric Test Results

Smoking Status	Shapiro-Wilk test		Wilcoxon signed-rank test	
	W	*p*	V	*p*
Non-smoker	0.582	.000	32685	.000
Smoker	0.874	.000	53485	1

CHAPTER 5

DISCUSSION AND IMPLICATION

Introduction

This chapter summarizes and discusses the findings of this study. First, this chapter provides a summary of the study. A discussion of findings from Chapter Four will be followed. Then implications that stem from the findings will be discussed according to the study results. Last, limitations of the study are stated and this chapter concludes with recommendation for future study.

Summary of the Study

The study evaluates aggregate monthly data from Kangwonland casino for April 2003 to May 2013. Based on a literature review of a smoking ban impacts on gaming volume, autoregressive integrated moving average [ARIMA] analysis was performed to evaluate Kangwonland casino gaming volume. Two models were run with dependent variables for table games drop and slot machine coin-in. Control variables were included as dummy variables for the smoking ban and ski open season. Furthermore, this study investigated casino customers' satisfaction toward a smoking ban by smoking status. Non-parametric test were chosen to test.

As a result of the ARIMA analysis, the smoking ban policy was shown that it did not affect significantly on either table games drop or slot coin-in. This is opposite of what many previous studies find (Craven & Marlow, 2008; Garrett & Pakko, 2010; Lal & Siahpush, 2008; Pakko, 2006; Pritos, Pritos, & Spears, 2008; Thalheimer & Ali 2008). The null hypothesis 1A and 1B were rejected as a result of ARIMA model test. The

results of this thesis may provide evidence of a smoking ban implementation in the casino industry.

Hypothesis 2 was concerned with whether a smoking ban policy affected the customers' satisfaction by smoking status. The second hypothesis (H2) was designed to measure the customers' satisfaction toward the smoking ban policy. Based on the previous findings of Eriksen and Chaloupka (2007), Roseman (2005), and Bradley and Becker (2011), it was expected that non-smokers expressed a strong preference to the smoke-free casino environment and smokers expressed a strong reluctance to the policy. In this study, it was hypothesized that non-smoking gamblers would indicate a strong likelihood of satisfaction to the smoke-free environment (H2A) and smoking gamblers would indicate a likelihood of dissatisfaction to the smoke-free environment (H2B). Hypothesis 2 was partially supported. It was found that non-smoking gamblers expressed a strong satisfaction to the smoke-free casino environment. The null hypothesis 2A was rejected. Smokers were also found to be satisfied with the smoke-free casino environment. The null hypothesis 2B was not rejected based on the test result. Table 10 indicates summarized test results of all null hypotheses.

Table 10

Null Hypothesis Test Results

Hypothesis Number	Null Hypothesis	Result
1A	A smoking ban will not decrease table drop	Not rejected
1B	A smoking ban will not decrease slot coin-in	Not rejected
2A	Non-smokers will not be satisfied	Rejected
2B	Smokers will be satisfied	Not rejected

Discussion of Findings

The goals of this thesis have been to examine the impact of a smoking ban on gaming volume and to better understand gamblers' satisfaction toward a smoke-free environment. Based on the collected data for this thesis, it was found that a smoking ban had no significant impact on both table games drop and slot coin-in for a one tailed test at the .05 significance level.

Based on previous research, it was expected that a smoking ban might distract gamblers concentration and continuity because they had to leave the gaming area to smoke (Barringer, Martin, & Susman, 2006; Craven & Marlow, 2008; Garrett & Pakko, 2010; Harper, 2003). However, the test results of this thesis found that it was not the case in Kangwonland casino. Gamblers may adjust their smoking pattern depending on the game process and adapt to the change. For example, smoking gamblers may leave the gaming table and smoke while the game pauses for cards shuffling and the gaming chips fill or credit. Slot machine gamblers may leave the gaming area and smoke while taking a break. The smoking ban may not distract players from continue the games so the smoke-free policy in Kangwonland did not impact gaming volume in a negative way.

In addition, there have been numerous previous studies that evaluated the impacts of a smoking ban on casino revenue and found negative effects (Garrett & Pakko, 2010; Lal & Siahpush, 2008; Pakko, 2006; Thalheimer & Ali, 2008). The finding of this thesis is the opposite of what these studies find. The prior studies' findings have involved a short-term time frame but this thesis used a long-term time frame data set. The finding of this thesis supports what Mandel, Alamar, and Glantz (2005) find that there is no significant difference in gaming revenue directly related to the smoking ban.

Casino operators stereotype that gambling takes place usually in a smoke-filled gaming room, so they do not account for non-smokers who may increase visit times to smoke-free casinos. More non-smoking gamblers may have come to Kangwonland as a result of the smoking ban. Also non-smoking gamblers may be more concentrated and continue gambling in smoke-free gaming environment since they are not distracted by cigarette smoke. It may explain that a smoking ban has no significant impact on table drop and slot coin-in.

The result of ARIMA model for table games drop indicated that February, June, August, and November were significant monthly variables. Regarding the significant and negative months, it may be explained that February, June, and November are the low season in Korea. On the other hand, August is the peak season in Korea since the summer holiday for Korean people begins the last week of July and ends the last week of August. These factors may explain the significant effect of monthly variables on table games drop in Kangwonland casino.

The result of ARIMA model for slot coin-in showed that all months except May and July were significant monthly variables. August was the only positive monthly variable, the same as table games drop. Table games drop seemed to be less influenced according to the month than slot coin-in. Table game seats are all occupied as soon as open the casino at 10 o'clock in every morning, unlike slot seats. It may explain the different significant monthly variable between table games drop and slot coin-in in Kangwonland casino.

It was found that the ski resort had no effect on either table games drop or slot coin-in at the .05 level. The ski resort opening may increase the number of visitors (Lee, 2010), but it did not influence the gaming volume in Kangwonland casino.

Regarding players satisfaction toward the smoking ban policy, it was found that both smoking gamblers and non-smoking gamblers were satisfied with the smoke-free environment. Based on the previous reviewed literature, non-smoking gamblers are expected to be satisfied with the non-smoking gaming environment (Barringer, Martin, & Susman, 2006; Garrett & Pakko, 2010; Harper, 2003). However, it is surprising that smoking gamblers are also revealed to be satisfied with the smoke-free environment on average in this study. This is the opposite of what previous studies find (Bloom, Smoot, Shore, & Shore, 1991; Brehm, Stires, Sensenig, & Shaban, 1966; Smith, 1977; Worchel, Andreoli, & Archer, 1976). Harmful effects of second-hand smoke are commonly well known so many people are becoming worried about second-hand smoke. Ironically, even smokers are not willing to be exposed to the environmental tobacco smoke for the health (Borland et al., 2006). In addition, smokers' satisfaction may be explained by a snowball effect (Tang et al., 2003). General Korean people might be accustomed to not smoking in other indoor environments since a smoking ban has been in place for about a decade before Kangwonland casino implemented it voluntarily. So Kangwonland casino visitors who are smokers might be already accustomed to the smoke-free environment.

Additionally, Kangwonland casino is the only legalized gambling facility for Korean domestic people, so people visit Kangwonland to gamble, refresh and relax with clean air, not to smoke. Therefore, smoke-free on the gaming floor may not affect people

to be dissatisfied. This result may help casino operational managers when they decide whether a smoking ban should be implemented on the gaming floor.

Implications from the Study

This study tested a table games drop model and slot machine coin-in model, which are constructed under related literature review, in order to examine a smoking ban influence. This thesis may have important implications for both researchers and operators.

First, this thesis adds to the previous literature regarding a smoking ban impact on casino gaming volume and customers' behavior. In addition, this study is the first study that evaluates a smoking ban's economic impact on an Asian casino. Kangwonland is the first casino, which fully banned smoking on the public gaming floor in January 2005. In October 2014, Macau started a full smoking ban in the public gaming area due to the employees' request for a smoke-free workplace and non-smoking citizen's demand for public health. Some Asian casinos designate non-smoking gaming zones to protect non-smoking gamblers, but do not fully restrict a smoking in the gaming floor. Given the lack of empirical research related to this subject, this thesis contributes a valuable source to the limited literature base related to a smoking ban impact on gaming volume in Asian casinos.

Second, the results of this thesis indicate that casino operators should prepare for players' demand and understand gamblers' behavior toward a smoking ban. As shown in the table games drop and slot coin-in model, a smoking ban had no effect on gaming volume. Even though this study did not observe the economic savings, smoke-free casinos may save money by reducing costs for ventilation, employees' health coverage,

and facility maintenance. Most of all, it saves lives from environmental tobacco smoke. Besides, the results of the survey in this thesis showed that not only non-smoking gamblers, but also smoking gamblers were satisfied with the smoke-free environment. This thesis may provide a principal piece to determine a smoking ban implementation to the casino operator and policymaker. As far as the majority of gamblers are satisfied with the smoke-free environment, casino operators and policymakers should not ignore the demands for the public health anymore and have to provide non-smoking gaming environment for both non-smokers and smokers. On average, approximately 80% of the worldwide populations are non-smokers (OECD Factbook, 2014). Casinos need to innovate to attract new and young players who are non-smokers. Consequently, non-smoking gamblers who are attracted to smoke-free casinos may enhance the casino revenue.

Third, the finding of this thesis may give an idea about which market casino marketers should focus on. When policymakers or casino operators make a decision whether to adopt a smoking ban on the gaming floor, they should consider customers' satisfaction, since significant relationship exists between customer satisfaction and future revenue. As shown in Table 5, gamblers who are older, more frequently visit, and are smokers have a low satisfaction score. If a smoking ban is implemented on the gaming floor, these peoples' resistance may be more vigorous. To reduce the resistance, casino operators can do a sales promotion. For instance, the casino can run point multiplier offers for senior citizens and loyal customers. Issuing a complimentary coupon for food and beverage or free-play coupon for those people can be also good promotions.

Limitations and Recommendation for Future Research

This thesis contains a number of limitations. First, the generalizability of the results is unqualified. The sampling area was a unique business condition. Kangwonland obtains the exclusive possession of operating a casino, meaning that Kangwonland is the only legally authorized casino for Koreans' entry out of 17 casinos. Under condition of monopolistic competition, gaming volume may not have been affected significantly by a smoking ban policy in Kangwonland casino, since it is predictable that Korean gamblers would continue to gamble in Kangwonland casino as far as there is no alternative. If smokers have alternatives, the result may be different. Therefore, the results of this thesis could be of questionable use to casino operators when deciding a smoking policy. Future studies should be conducted on casino properties under competitive environments. Researchers will soon have an opportunity to test a smoking ban impact in Macau casinos. By examining the impact, the results will be more objective and acceptable when smoking casino operators make a decision whether to adopt a smoking ban regulation.

Second, this thesis used monthly table games drop and slot coin-in data from Kangwonland. Kangwonland collects and counts drop and coin-in on a daily basis so the monthly data can be missing some data in the aggregating process. Also this study adopted monthly gaming data with 122-month period from April 2003 to May 2013. The recent data after May 2013 were not employed because there have been many changes in casino operational policies due to the gaming facility extension. Moreover, all possible impacts on gaming volume may not be captured in the time series models.

Third, there are some limitations in using the secondary survey data. The survey was not designed for this study, so validity of the survey is limited. The survey was

conducted in 2006, which had been a year since the smoking ban was implemented. So the result of the survey may be out of date. Also, the survey results cannot explain how the gamblers attitudes have changed toward a smoking ban because there is no prior survey data for comparison. If the survey identified the customers' opinion about a smoking ban policy before implementation, this study could have examined how a smoking ban policy affected on the casino customers' satisfaction more in detail. Besides Kangwonland casino employees, such as dealers, pit clerks, and slot attendants, collected the questionnaires. It might cause biased results since the respondents could be chosen by acquaintance of employees. The questionnaire collectors' opinion might have affected the respondents' answer as well. In addition, the survey was done inside the gaming area so the results represented the current gamblers opinion only.

A fourth limitation was the use of only public areas. The members-only gaming area occupies a large portion in Kangwonland casino in terms of gaming volume. Therefore, it could have seen a different result if smoking was banned there.

Directions for future research are closely connected to these secondary survey limitations. First, future studies should be conducted on casino properties under competitive environments. Researchers will soon have an opportunity to test a smoking ban impact in Macau casinos. By examining the impact, the results will be more objective and acceptable when smoking casino operators make a decision whether to adopt a smoking ban regulation.

Second, more possible variables should be included in the test model with recent gaming volume data. Along with months and ski resort open season that are used in this thesis to account for the possible influence on gaming volume, golf course open and

condominium extension may have some impacts on gaming volume. Also weather condition could have affected to the gaming volume since Kangwonland casino is located in an isolated mountain area in Korea. If all those variables were added to the model, it could produce better results in explaining the variances in the models.

Last, it would be helpful to conduct a survey before a smoking ban implementation. By comparing before and after survey data, casino managers can determine the impacts of a smoking ban on customers behavior and perception change more accurately. Also non-gamblers opinion needs to be collected since they are potential casino customers. Therefore, before a smoking ban, a survey should be designed to select gamblers and non-gamblers as target populations.

Conclusion

It is time for smoking casino operators to consider the public health on the gaming floor. The times of gambling under the irritating cigarette smoke have gone. Worldwide, as smoking rates are decreasing these days, casino managers should think of the non-smokers' right to be protected from second-hand smoke. Public health supporters argue that smoking bans are essential because of the harmful second-hand smoke. In Macau, the world's largest gambling hub, a smoking ban has taken into effect on the public gaming floor in October 2014. It is reported that members-only and private gaming area in Macau also will be included as smoke-free areas in 2016 (Stutz, 2015). In spite of the negative impact that analysts initially predicted, Macau has chosen a clean air gaming environment for the public health. Providing healthy and clean gaming environment for players is the casino operators' social obligation. A smoking ban may cause casino revenue decline for a short period time. However, findings of this thesis show that a

smoking ban has no significant impact on gaming volume in the long run. In addition, smoke-free environment is beneficial due to the cost savings and life savings as well. Furthermore, declining smoking prevalence is a worldwide trend, so if casino operators properly market to the large number of non-smoking gamblers and current non-gamblers who do not smoke, smoke-free casinos may actually provide a casino gaming industry with a significant competitive advantage in attracting non-smoking gamblers and new customers, as compared to the small number of casino gamblers that may be lost to smoke filled casinos.

APPENDIX

IRB APPROVAL

UNLV

Social/Behavioral IRB –Review
Notice of Excluded Activity

DATE: January 22, 2015

TO: **Dr. Toni Repetti,** Hotel Administration

FROM: Office of Research Integrity – Human Subjects

RE: Notification of IRB Action
Protocol Title: **The Impacts of a Smoking Ban on Gaming Volume and Customers' Satisfaction in Casino Industry in South Korea**
Protocol# 1501-5057

This memorandum is notification that the project referenced above has been reviewed as indicated in Federal regulatory statutes 45CFR46.

The protocol has been reviewed and deemed excluded from IRB review. It is not in need of further review or approval by the IRB.

Any changes to the excluded activity may cause this project to require a different level of IRB review. Should any changes need to be made, please submit a Modification Form.

If you have questions or require any assistance, please contact the Office of Research Integrity – Human Subjects at IRB@unlv.edu or call 895-2794.

Office of Research Integrity – Human Subjects
4505 Maryland Parkway • Box 451047 • Las Vegas, Nevada 89154-1047
(702) 895-2794 • FAX: (702) 895-0805

REFERENCES

Adda, J., Berlinski, S., & Machin, S. (2007). Short-run economic effects of the Scottish smoking ban. *International Journal of Epidemiology, 36*, 149-154.

Adhikari, B., Kahende, J., Malarcher, A., Pechacek, T., & Tong, V. (2008). Smoking-attributable mortality, years of potential life lost, and productivity losses. United States, 2000-2004. *Centers for Disease Control and Prevention Morbidity and Mortality Weekly Report*, *57*(45), 1226-1228.

American Gaming Association. (2013). State of the states: The AGA survey of casino entertainment. Washington, D. C.

American Nonsmokers' Rights Foundation. (2014a). *U. S. smokefree casinos and gambling facilities*. Berkeley, CA. Retrieved from http://www.no-smoke.org/pdf/smokefreecasinosandgambling.pdf

American Nonsmokers' Rights Foundation. (2014b). *Summary of 100% smokefree state laws and population protected by 100% U.S. smokefree laws*. Retrieved from http://www.no-smoke.org/pdf/SummaryUSPopList.pdf

Arheart K. L., Lee, D. J., Dietz, N. A., Wilkinson, J. D., Clark, III. J. D., LeBlanc, W. G., … Fleming, L. E. (2008). Declining trends in serum cotinine levels in U.S. worker groups: The power of policy. *Journal of Occupational and Environmental Medicine*, *50*(1), 57–63.

Ashley, M. J., Cohen, J., Bull, S., Ferrence, R., Poland, B., Pederson, L., & Gao, J. (2000). Knowledge about tobacco and attitudes toward tobacco control: How different are smokers and nonsmokers? *Canadian Journal of Public Health / Revue Canadienne de Sante'e Publique*, *91*(5), 376-380.

Bakhturidze, G. D., Mittelmark, M., Aarø, L. E., & Peikrishvili, N. T. (2013). Attitudes towards smoking restrictions and tobacco advertisement bans in Georgia. *British Medical Journal Open*, vol. 3.

Barringer, S. G., Martin, M., & Susman, T. M. (2006). Indoor air quality and the gaming industry. *American Gaming Association.* 1-16.

Barrow, C., & Borges, D. (2014). Casinos, smoking bans, and revenues: A survey of casino gamblers in Illinois. *Gaming Law Review and Economics*. *18*(6). 540-556.

Behan, D. F., Eriksen, M. P., & Lin, Y. (2005). Economic effects of environmental tobacco smoke. *Society of Actuaries*, 1-26.

Biener, L., & Siegel, M. (1997). Behavior intentions of public after bans on smoking in restaurants and bar. *American Journal of Public Health*, *87*, 2042-2044.

Bloom, A. J., Smoot, D. A., Shore, T. H., & Shore L. M. (1991). Toward a perceptual model of smoking policy satisfaction. *The Journal of Social Psychology*, 132(6), 675-684.

Bojanic, D. C. (1996). The smoking debate: A look at the issues surrounding smoking bans in restaurants. *Hospitality Research Journal*, *20*, 27-38.

Boles, M., Dilley, J., Maher, J. E., Boysun, M. J., & Reid, T. (2010). Smoke-free law associated with higher-than-expected taxable retail sales for bars and taverns in Washington State. *Preventing Chronic Disease, 7*(4), A79. Retrieved from http://www.cdc.gov/pcd/issues/2010/Jul/pdf/09_0187.pdf

Borland, R., Yong, H. H., Siahpush, M., Hyland, A., Campbell, S., Hastings, G., . . . Fong, G. T. (2006). Support for and reported compliance with smoke-free

restaurants and bars by smokers in four countries: Findings from the international tobacco control four country survey. *Tobacco Control*, *15*(3), 34–41.

Box, G., Jenkins, G. M., & Reinsel, G. C. (2008). *Time series analysis: Forecasting and control* (4th ed.). Hoboken, NJ: John Wiley.

Brehm, J. W., Stires, L. K., Sensenig, J., & Shaban, J. (1966). The attractiveness of an eliminated choice alternative. *Journal of Experimental Social Psychology*, *2*, 301–313.

Brehm, S. S., & Brehm, J. W. (1981). *Psychological reactance: A theory of freedom and control*. San Diego, CA: Academic Press.

Brooks, D., & Mucci, L. (2001). Support for smokefree restaurants among Massachusetts adults, 1992–1999. *American Journal Public Health*, *91*(2), 300–303.

Bushman, B. J., & Stack, A. D. (1996). Forbidden fruit versus tainted fruit: effects of warning labels on attraction to television violence. *Journal of Experimental Psychology, 2,* 207–226.

Cancer Research UK. (2008). *Smoking ban triggered the biggest fall in smoking ever seen in England*. Retrieved from http://www.cancerresearchuk.org/about-us/cancer-news/press-release/2008-06-30-smoking-ban-triggered-the-biggest-fall-in-smoking-ever-seen-in-england

Centers for Disease Control and Prevention. (2007). Reduced secondhand smoke exposure after implementation of a comprehensive statewide smoking Ban, *Morbidity and Mortality Weekly Report, 56(*28*),* 705-708.

Centers for Disease Control and Prevention. (2009). *Cotinine Factsheet*. Retrieved from http://www.cdc.gov/biomonitoring/pdf/Cotinine_FactSheet.pdf

Centers for Disease Control and Prevention. (2010a). *Chemicals in tobacco smoke. Surgeon General's Reports*. Retrieved from http://www.cdc.gov/tobacco/data_statistics/sgr/2010/consumer_booklet/chemicals_smoke/

Centers for Disease Control and Prevention. (2010b). *Vital signs: Nonsmokers' exposure to secondhand smoke-United States, 1999-2008*. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5935a4.htm

Centers for Disease Control and Prevention. (2014). *Smoke-free policies improve air quality in hospitality settings.* Retrieved from http://www.cdc.gov/tobacco/data_statistics/fact_sheets/secondhand_smoke/protection/air_quality/

Centers for Disease Control and Prevention. (2015). *Vital signs: Disparities in nonsmokers' exposure to secondhand smoke—United States, 1999–2012*. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6404a7.htm?s_cid=mm6404a7_w

Choong, T. (2013). Casinos have designated smoking areas: NEA. *The Straits Times.* Retrieved from http://www.straitstimes.com/premium/forum-letters/story/casinos-have-designated-smoking-areas-nea-20130923

Clower, T. L., & Weinstein, B. L. (2004). The Dallas smoking ordinance one year later: A report on the impacts of the city of Dallas smoking ban on alcoholic beverage

sales March 2003 to March 2004. Retrieved from http://apps.opkansas.org/city-government/agendas-and-minutes/community-development/agendas/2005/2005-07-06/DIS-2-11.PDF

Collins, D., & Lapsley, H. (2008). *The costs of tobacco, alcohol and illicit drug abuse to Australian society in 2004/05*. Canberra: Commonwealth of Australia.

Congressional Budget Office. (2012). *Raising the excise tax on cigarettes: Effects on health and the federal budget.* Retrieved from http://www.cbo.gov/sites/default/files/cbofiles/attachments/06-13-Smoking_Reduction.pdf

Corsun, D. L., Young, C. A., & Enz, C. A. (1996). Should NYC's restaurateurs lighten up? Effects of the city's Smoke-Free-Air Act. *Cornell Hotel and Restaurant Administration Quarterly*, *37*(2), 25-33.

Cowling, D. W., & Bond, P. (2005). Smoke-free laws and bar revenues in California: The last call. *Health Economics*, *14*, 1273- 1281.

Craven, B., & Marlow, M. (2008). Economic effects of smoking bans on restaurants and pubs. *Economic Affairs*, 57-61.

Dockrell, M., DeLacy, E., Morrison, R., Buchanan, T., & Lewis, K. E. (2010). Public attitudes to the UK smoking ban. *Thorax*, *65*(4), 156.

Egan, S. (2013). Why smoking rates are at new lows. *The New York Times.* Retrieved from http://well.blogs.nytimes.com/2013/06/25/why-smoking-rates-are-at-new-lows/?_php=true&_type=blogs&_r=0

Eriksen M, & Chaloupka F. (2007). The economic impact of clean indoor air laws. *A Cancer Journal for Clinicians, 57*, 367–378.

Fellinger, R. (2014). State house considers ban on casino smoking. *Public opinion.* Retrieved from http://www.publicopinionononline.com/localnews/ci_4354785

Fogarty, J. S. (1997). Reactance theory and patient noncompliance. *Social Science & Medicine*, *45*(8), 1277–1288.

Garrett, T. A., & Pakko, M. R. (2010). The revenue performance of casinos after a smoking ban: The case of Illinois. St. Louis, MO: Federal Reserve Bank of St. Louis. Retrieved from http://research.stlouisfed.org/wp/2009/2009-027.pdf

Glantz, S. A. (2007). Commentary: Assessing the effects of the Scottish smokefree law: The placebo effect and the importance of obtaining unbiased data. *International Journal of Epidemiology*, *36*, 155-156.

Glantz, S. A., & Charlesworth, A. (1999). Tourism and hotel revenues before and after passage of smoke-free restaurant ordinances. *Journal of the American Medical Association*, *281*, 1911-1918.

Glantz, S. A., & Smith, L. R. A. (1994). The effect of ordinances requiring smoke-free restaurants on restaurant sales. *American Journal of Public Health*, *84*(7), 1081-1085.

Glantz, S. A., & Smith, L. R. A. (1997). The effect of ordinances requiring smoke-free restaurants and bars on revenues: A follow-up. *American Journal of Public Health*, *87*, 1687-1693.

Goodman, P., Agnew, M., McCaffrey, M., Paul, G., & Clancy, L. (2007). Effects of the Irish smoking ban on respiratory health of bar workers and air quality in Dublin pubs. *American Journal of Respiratory & Clinical Care Medicine*, *175*(8), 840-845.

Greenlees, E. M. (2008). *Casino accounting and financial management* (2nd ed.). Reno, NV: University of Nevada Press, Reno.

Gu, Z. (1999). The impact of the Asian financial crisis on Asian gaming activities: An examination of Las Vegas strip casino drops. *Current Issues in Tourism*, *2*(4), 354-365.

Hairon, N. (2008). Smoking ban in England has a dramatic impact on prevalence. *Nursing Times*, *104*(27), 23-24. Retrieved from http://www.nursingtimes.net

Harper, T. (2003). Smoking and gambling: A trance inducing ritual. *Tobacco Control*, *12*, 231-233.

Harris, J. K., Carothers, B. J., Luke, D. A., Silmere, H., McBride, T. D., & Pion, M. (2011). Exempting casinos from the smoke-free Illinois Act will not bring patrons back: They never left. *Tobacco Control*, *21*, 373-376.

Haw, S. J., & Gruer, L. (2007). Changes in exposure of adult non-smokers to secondhand smoke after implementation of smoke-free legislation in Scotland: National cross sectional survey. *British Medical Journal, 335*(7619), 549–552.

Hyland, A., Puli, V., Cummings, M., & Sciandra, R. (2003). New York's smoke-free regulations: Effects on employment and sales in the hospitality industry. *Cornell Hotel and Restaurant Administration Quarterly*, *44*, 9-16.

Invernizzi, G., Rupercht, A., Mazza, R., Rossetti, E., Sasco, A., Nardini, S., & Boffi, R. (2004). Particulate matter from tobacco versus diesel car exhaust: An educational perspective. *Tobacco Control*, *13*, 219–221.

John, R., Sung, H., & Max, W. (2009). Economic cost of tobacco use in India, 2004. *Tobacco Control*, *18*, 138-143.

Kaiserman, M. (1997). The cost of smoking in Canada. *Chronic Diseases in Canada*, *18*(1), 13–9.

Kang, H., Kim, H., Park, T., Jee, S., Nam, C., & Park, H. (2003). Economic burden of smoking in Korea. *Tobacco Control*, *12*, 37-44.

Kangwonland. (2006). *2005 annual report*. Kangwon-do: Kangwonland Inc.

Kansas City Business Journal. (2008). *KC smoking ban will take effect Saturday*. Retrieved from http://www.bizjournals.com/kansascity/stories/2008/06/16/daily41.html

Kayani, N., Cowan, S. R., Homan, S. G., Wilson, J., Warren, V. F., & Yun, S. (2012). Economic effect of smoke-free ordinances on 11 Missouri cities. *Preventing Chronic Disease, 9*. Retrieved from http://dx.doi.org/10.5888/pcd9.110277

Kilby, J., Fox, J., & Lucas, A. F. (2005). *Casino operations management* (2nd ed.). New York, NY: John Wiley & Sons.

Koh, H. K., Joossens, L. X., & Connolly, G. N. (2007). Making smoking history worldwide. *The New England Journal of Medicine*, *356*, 1496–1498.

Korea Casino Association. (2014). *Kangwonland Casino*. Retrieved from http://www.koreacasino.or.kr/english/sub.php?loc=partner&file_view=./partner/kangwonland.html

Kutner, M. H., Nachtsheim, C. J., Neter, J., & Li, W. (2005). *Applied Linear Statistical Models* (5th ed.). New York, NY: McGraw-Hill.

Lal, A., & Siahpush, M. (2008). The effect of smoke-free policies on electronic gaming machine expenditure in Victoria, Australia. *Journal Epidemiol Community Health, 62*, 11-15.

Lee, Y. (2010). *Estimating the future growth potential of Kangwonland casino*. (Master's theses). Retrieved from ProQuest Dissertations and Theses. (Order No. 1488686).

Levy, D. T., Nikolayev L., & Mumford, E. (2005). Recent trends in smoking and the role of public policies: Results from the SimSmoke tobacco control policy simulation model. *Society for the Study of Addiction*, *100*, 1526-1536.

Levy, D. T., Cho, S., Kim, Y., Park, S., Suh, M., & Kam, S. (2010). SimSmoke model evaluation of the effect of tobacco control policies in Korea: The unknown success story. *American Journal of Public Health, 100*(7), 1267-1273.

Levy, H. (2012). *The economic impact of Michigan's Dr. Ron Davis Smoke-Free Air Law: A report to the Michigan Department of Community Health*. Retrieved from https://www.michigan.gov/documents/mdch/U_of_M_Economic_Impact_Study_9-12_398127_7.pdf

Lykke, M., Helbech, B., & Glümer, C. (2014). Temporal changes in the attitude towards smoking bans in public arenas among adults in the Capital Region of Denmark from 2007 to 2010. *Scandinavian Journal of Public Health, 42*, 401–408.

Mandel L. L., Alamar, B. C., & Glantz. S. A. (2005). Smoke-free law did not affect revenue from gaming in Delaware. *Tobacco Control*. Retrieved from http://tobaccocontrol.bmj.com/content/14/1/10.full

Martinez-Sanchez, J. M., Gallus, S., Zuccaro, P., Colombo, P., Fernandez1, E., Manzari, M., & La Vecchia, C. (2011). Exposure to secondhand smoke in Italian non-smokers 5 years after the Italian smoking ban. *European Journal of Public Health*, *22*(5), 707–711.

McGhee, S. M., Ho, L. M., Lapsley, H. M., Chau, J., Cheung, W. L., Ho, S. Y., … Hedley, A. J. (2006). Cost of tobacco-related diseases, including passive smoking, in Hong Kong. *Tobacco Control*, *15*, 125–130.

McNabb, J., & Hearns, N. (2005). The smoking ban in hospitality: A cross-border perspective from Ireland. *International Journal of Contemporary Hospitality Management*, *17*(2), 181-190.

Ministry of Health and Welfare. (2010). *National Health Promotion Act*. Retrieved from http://www.tobaccocontrollaws.org

Ministry of Health and Welfare. (2011). *The National Health Plan 2020 (2011~2020).* Retrieved from http://www.mw.go.kr/front_new/jb/sjb030301vw.jsp

Ministry of Health and Welfare. (2015). *Government unveils anti-smoking measures*. Retrieved from http://english.mw.go.kr/front_eng/al/sal0201vw.jsp?PAR_MENU_ID=1002&MENU_ID=100203&page=1&CONT_SEQ=305454

National Institute of Economic and Industry Research. (2000). *The economic impact of gambling, March 2000*. Report prepared for the Victorian Casino and Gaming Authority, Spring Street, Melbourne, Victoria.

Neubauer, S., Welte, R., Beiche, A., Koenig, H., Buesch, K., & Leidl, R. (2006). Mortality, morbidity and costs attributable to smoking in Germany: update and a 10-year comparison. *Tobacco Control*, *15*, 464-471.

Nevada Clean Indoor Air Act. (2006). *NRS 202.2491. Smoking tobacco: Unlawful in certain public places; posting signs; designation of areas for smoking*.

New Jersey Smoke Free Air Act. (2006). *C.26: 3D-59 Exceptions. 5, The provisions of*

this act shall not apply to.

Öberg, M., Jaakkola, M. S., Woodward, A., Peruga, A., & Prüss-Ustün, A. (2011). Worldwide burden of disease from exposure to second-hand smoke: A retrospective analysis of data from 192 countries. *The Lancet*, *377*, 139-146.

Organization for Economic Cooperation and Development. (2014). *Economic, environmental and social statistics (change in smoking rates: Percentage change over the period 2000-11 or latest available period)*. Retrieved from http://www.oecd-ilibrary.org/economics/oecd-factbook-2014/change-in-smoking-rates_factbook-2014-graph230-en

Pakko, M. (2006). Smoke-free law did affect revenue from gaming in Delaware. *Tobacco Control, 15*, 68–69.

Park, E., Lim, M., Yang, W., Yun, E., Oh, J., Jeong, B., … Tamplin, S. (2013). Policy effects of secondhand smoke exposure in public places in the republic of Korea: Evidence from PM2.5 levels and air nicotine concentrations. *Asian Pacific Journal of Cancer Prevention*, *14*(12), 7725-7730.

Pennsylvania Clean Indoor Air Act. (1988). *Senate Bill No. 246. Section 3, Prohibition. (b) exceptions.*

Pederson, L., Bull, S., Ashley, M. J., & Lefcoe, N. M. (1987). A population survey in Ontario regarding restrictive measures on smoking: Relationship of smoking status to knowledge, attitudes and predicted behaviour. *International Journal Epidemiol*, *16*(3), 383-391.

Pickett, M. S., Schober, S. E., Brody, D. J., Curtin, L. R., & Giovino, G. A. (2006). Smoke-free laws and secondhand smoke exposure in US non-smoking adults, 1999-2002. *Tobacco Control*, *15*, 302–307.

Pierce, J. P., & León, M. E. (2008). Effectiveness of smoke-free policies. *The Lancet Oncology*, *9*(7), 614–615.

Pindyck, R. S., & Rubinfeld, D. L. (1998). *Econometric models and economic forecasts* (4th ed). New York, NY; Irwin/McGraw-Hill.

Pirkle J. L., Bernert J. T., Caudill S. P., Sosnoff C. S., & Pechacek T. F. (2006). Trends in the exposure of nonsmokers in the U.S. population to secondhand smoke: 1988–2002. *Environmental Health Perspectives, 114*(6), 853–858.

Poland, B.D., Cohen, J.E., Ashley, M.J., Adlaf, E., Ferrence, R., Pederson, L.L., . . . Raphael, D. (2000). Heterogeneity among smokers and non-smokers in attitudes and behaviours regarding smoking and smoking restrictions. *Tobacco Control*, 9, 364-371.

Pritsos, C. A., Pritsos, K. L., & Spears, K. E. (2008). Smoking rates among gamblers at Nevada casinos mirror U. S. smoking rate. *Tobacco Control*, *17*(2), 82-85.

Pyles, M. K., & Hahn, E. J. (2011). Economic effect of Ohio's smoke-free law on Kentucky and Ohio border counties. *Tobacco Control*, *20*, 73-76.

Repetti, T. (2011). Recent research trends in the gaming industry: A content analysis of research literature on casino profits. *UNLV Gaming Research & Review Journal, 15*(2), 93-95.

Ridgewood Economic Association. (2004). *The economic impact of the New York State smoking ban on New York's bars*. Retrieved from http://kuneman.smokersclub.com/PDF/Ridgewoodstudy.pdf

Roseman, M. (2005). Consumer opinion on smoking bans and predicted impact on restaurant frequency. *International Journal of Hospitality & Tourism Administration*, *6*(4), 49-69.

Ross, H., Trung, D. & Phu, V. (2007). The costs of smoking in Vietnam: The case of inpatient care. *Tobacco Control, 16*(6), 405-409.

Schick, S., & Glantz, S. (2005). Philip Morris toxicological experiments with fresh sidestream smoke: More toxic than mainstream smoke. *Tobacco Control*, *14*, 396–404.

Scollo, M., & Lal, A. (2008). Summary of studies assessing the economic impact of smoke-free policies in the hospitality industry— includes studies produced to 31 January 2008. *VicHealth Centre for Tobacco Control*. Retrieved from http://www.vctc.org.au/tc-res/Hospitalitysummary.pdf

Scollo, M., Lal, A., Hyland, A., & Glantz, S. (2003). Review of the quality of studies on the economic effects of smoke-free policies on the hospitality industry. *Tobacco Control*, *12*, 13-20.

Shapiro, S., & Wilk, M. (1965). An analysis of variance test for normality. *Biometrika, 52*, 591-611.

Smith, M. J. (1977). The effects of threats to attitudinal freedom as a function of message quality and initial receiver attitude. *Communication Monographs*, *44*, 196–206.

Smoke Free Arizona Act. (2007). *Arizona secretary of state §36-601.01 (B)*.

Smoking Act Singapore. (1992). *Smoking (prohibition in certain places) Act (Cap 310).* Retrieved from http://statutes.agc.gov.sg

Stutz, H. (2015). Macau, already reeling, faces possible total smoking ban. *Las Vegas Review Journal.* Retrieve from http://www.reviewjournal.com/columns-blogs/inside-gaming/macau-already-reeling-faces-possible-total-smoking-ban

Suh, E., & Lucas, A. F. (2011). Estimating the impact of showroom entertainment on the gaming volumes of Las Vegas hotel-casinos. *International Journal of Hospitality Management*, *30*, 103-111.

Sung, H., Wang, L., Jin, S., Hu, T., & Jiang, Y. (2006). Economic burden of smoking in China, 2000. *Tobacco Control*, *15*, 5–11.

Sung, H., Chang, L., Wen, Y., & Tsai, Y. (2014). The costs of smoking and secondhand smoke exposure in Taiwan: A prevalence-based annual cost approach. *British Medical Journal open*. Retrieved from http://dx.doi.org/10.1136/bmjopen-2014-005199

Surgeon General. (2014). *The health consequences of smoking-50 years of progress; A report of the Surgeon General.* Retrieved from http://www.surgeongeneral.gov/library/reports/50-years-of-progress/full-report.pdf

Tang, H., Cowling, D. W., Lloyd, J. C., Rogers, T., Koumjian, K. L., & Stevens, C. M. (2003). Changes of attitudes and patronage behaviors in response to a smoke-free bar law. *American Journal of Public Health, 93*(4), 611-617.

Thalheimer, R., & Ali, M. M. (2008). The demand for casino gaming with special reference to a smoking ban. *Economic Inquiry*, *46*(2), 273-282.

Thrasher, J. F., Perez-Hernandez, R., Swayampakala, K., Arillo-Santillán, E., & Bottai, M. (2010). Policy support, norms, and secondhand smoke exposure before and after implementation of a comprehensive smoke-free law in Mexico City. *American Journal of Public Health*, *100*(9), 1789–1798.

Thyrian, J. R., Panagiotakos, D. B., Polychronopulos, E., Willemsen, M. C,, Zatoński, W., & John, U. (2010). The exposure to environmental tobacco smoke and attitudes towards tobacco control measures–a comparison of 5 European countries. *Central Europe Journal Public Health, 18*(2), 87–92.

United States Department of Health and Human Services. (2006). *The health consequences of involuntary exposure to tobacco smoke: A report of the surgeon general*. Retrieved from http://permanent.access.gpo.gov/lps72954/executivesummary.pdf

United States Department of Labor. (2001). Consumer price index overview. Retrieved from http://stats.bls.gov/cpi/cpiovrvw.htm

Viriyachaiyo, V., & Lim, A. (2009). Tourists' attitudes towards ban on smoking in air-conditioned hotel lobbies in Thailand. *Tobacco Control*, *18*, 238-240.

Walsh, R. A., Paul, C. L., Tzelepis, F., Stojanovski, E., & Tang, A. (2008). Is government action out-of-step with public opinion on tobacco control? Results of New South Wales population survey. *Australian and New Zealand Journal of Public Health, 32*(5), 482-488.

Wiium, N., Aarø, L. E., & Hetland, J. (2009). Psychological reactance and adolescents' attitudes toward tobacco-control measures. *Journal of Applied Social Psychology*, *39*(7), 1718-1738.

Willson, K. L. (2005). *Identifying heterogeneity of attitudes among smokers and non-smokers regarding smoking and smoking restrictions*. (Master's theses). Retrieved from ProQuest Dissertations and Theses. (Order No. MR02287).

Woodeshick, K. (2006). Smoking ban legislation in New Jersey: Should casinos be immune from smoke? *Rutgers Journal of Law & Urban Policy*, *3*(3), 496-519.

Worchel, S., Andreoli, V. A., & Archer, R. (1976). When is a favor a threat to freedom: The effects of attribution and importance of freedom on reciprocity. *Journal of Personality*, *44*(2), 294–310.

World Health Organization. (2009). *WHO report on the global tobacco epidemic*. Retrieved from http://whqlibdoc.who.int/publications/2009/9789241563918_eng_full.pdf

World Health Organization. (2011). *Assessment of the economic costs of smoking*. Retrieved from http://whqlibdoc.who.int/publications/2011/9789241501576_eng.pdf

World Health Organization. (2013). *WHO Report on the global tobacco epidemic, 2013*: *Enforcing bans on tobacco advertising, promotion and sponsorship*. 58-80.

World Health Organization. (2014). *Tobacco*. Fact sheet number 339. Retrieved from http://www.who.int/mediacentre/factsheets/fs339/en/

World Health Organization International Agency for Research on Cancer. (2004). Tobacco smoke and involuntary smoking. IARC. *Monographs on the Evaluation of Carcinogenic Risks to Humans*, *83*, 1191-1196.

World Health Organization International Agency for Research on Cancer. (2009). Evaluation of the effectiveness of smoke-free polices. *IARC Handbooks of Cancer Prevention in Tobacco Control*, *13*.

World Health Organization International Agency for Research on Cancer. (2011). Effectiveness of tax and price policies for tobacco control. *IARC Handbooks of Cancer Prevention in Tobacco Control*, *14*.

CURRICULUM VITAE

SOJEONG LEE

CONTACT INFORMATION

Email: lees41@unlv.nevada.edu
Local Address: 8778 Frasure Falls Ave., Las Vegas, NV 89178
Tel: 1 702 788 8491

EDUCATION

- Aug 2013 - May 2015 — Master of Science in Hotel Administration
  University of Nevada, Las Vegas
- Mar 1994 - Feb 1999 — Bachelor of Tourism
  Hanyang University. Seoul, South Korea

EMPLOYMENT

- Sep 2000 – present — Casino Operational and planning Manager
  Kangwonland Inc. South Korea
  (May 2008 – Sep 2009) — Casino Operation Consultant (Overseas Position)
  Kangwonland Inc. Subic, Philippines
- Feb 1999 – Apr 2000 — Front Desk Captain
  Hyundai Kumgang Cruise Ship, South Korea

RELEVANT EXPERIENCE

- Casino Operation Management
- Published Casino Regulation Booklet
- Human Resources Development
- Casino Supplies Purchase and Budgeting

CERTIFICATES & LICENSES

- Tourism Employee License –Tourist Guide (English), KTO (2001)
- Information Technology Qualification - MS Excel, MS PowerPoint (2006)

Thesis Title: The Impacts of a Smoking Ban on Gaming Volume and Customers' Satisfaction in the Casino Industry in South Korea

Thesis Examination Committee:
Chairperson, Tony Repetti, Ph.D.
Committee Member, Bo Bernhard, Ph.D.
Committee Member, Ashok Singh, Ph.D.
Graduate Faculty Representative, Bradley Wimmer, Ph.D.