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# Estimating the future growth potential of Kangwon Land casino

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ESTIMATING THE FUTURE GROWTH POTENTIAL  
OF KANGWON LAND CASINO

by

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A thesis submitted in partial fulfillment  
of the requirements for the

**Master of Science in Hotel Administration**  
**William F. Harrah College of Hotel Administration**

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**THE GRADUATE COLLEGE**

We recommend the thesis prepared under our supervision by

**Yunekyong Lee**

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**December 2010**

**Abstract**  
**Estimating the Future Growth Potential**  
**of Kangwon Land Casino**

by

Yunekyoung Lee

Dr. Ashok K. Singh, Examination Committee Chair  
Professor of Hotel Management Department  
University of Nevada, Las Vegas

The purpose of this study was to examine the further revenue growth potential for Kangwon Land casino in the context of visitor's spending trend. Using table games drop as an indicator of overall gaming demand, a time series regression with dummy variables was utilized to develop a forecast model for table games drop. Then, the predicted data was divided by the number of visitors in an effort to control for the visitor effect. Table games drop data was collected from Kangwon Land casino reflecting the period from November 2000 to May 2008. The Number of visitor data was also collected from Kangwon Land from November 2000 to September 2010. The findings revealed that Kangwon Land casino has experienced a decrease in customer's expense since June 2006. The findings of this study imply the potential leveling of gaming demand as a result of decreased visitor's spending. With the findings of the current work, this study would help Kangwon Land in their response to secure further business sustainability.

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## CHAPTER 1

### INTRODUCTION

The Asian gaming industry is entering an unprecedented era of opportunity. The huge success of the Macau casino industry has legitimized the increasing global nature of gaming entertainment. Macau has become the world's biggest gambling hub in terms of revenue just eight years after the government ended the monopoly system and opened doors for foreign investors (Wee, 2010). Las Vegas Sands Corp. derived 73% of 2009 revenue from Macau operations (Longid, 2010). Likewise, the opening of the two integrated gaming resorts in Singapore this year has already shown an indication of comparable success. The Singapore government is expecting a total of S\$ 2 billion into Singapore's economy in 2010 as the two casinos have already generated S\$ 740 million in revenue ("Casino cash good," 2010). Major U.S. casino operators see the greatest opportunities primarily in Asia as they already witnessed the fast-growing market in Macau. Korea is considered as a new potential market along with Malaysia, Singapore, Taiwan, and Thailand (Fahrenkopf, 2005).

The history of Korean casino industry began in 1967 with a legalization of casino gambling. Now, there are 17 casinos currently operating in 9 out of 16 cities. It could be said that the Korean government certainly has the closed and biased perspective on casino industry as they are okay with foreigners gambling in Korea but not with the domestics to gamble. Korea has the unique two tiered system which differentiates casinos in which only foreigners are allowed from the ones that allow domestic entry. Out of a total of 17 casinos, 16 casinos are exclusive for foreigners and only 1 casino is open to domestic passport holders. Casinos, however, are not the only legal type of gambling in

Korea. Pari-mutuel gambling facilities and lottery have the bigger share of total gambling volume in Korea. In fact, casino industry recorded US\$ 1.9 billion and it accounted for only 12.6% of the total gambling revenue (US\$ 15 billion) in 2009 (The National Gaming Control Commission, 2010). More importantly, the only domestic entry casino accounted for 55.7% of total casino revenue whereas the remaining 16 casinos accounted for 44.3%. It is apparent that the potential for the South Korean casino market would be much bigger if the government were to open the whole market to domestic Koreans. Several local governments have been requesting for opening of more domestic casinos, however, there is no sign currently that such liberalization of access is on the political agenda (Park, 2009).

There are many similarities in the rationale to legalize gambling for locals between Colorado and Kangwon Land, the only casino in Korea for domestic entry. First, the State of Colorado approved limited stakes gaming in two historic gold mining areas (Black Hawk/Central City, and Cripple Creek) to revitalize their economy. Second, Colorado began with a small numbers of casinos (11), and gradually increased it to 40 casinos. Third, the State of Colorado achieved a remarkable revenue growth in relatively short period. Colorado casino revenues have increased tenfold since the beginning of casino operation (Colorado State Department, 2010). The Kangwon Land Province referred to the Colorado case a lot when they appealed to the government for deregulation, such as expansion of number of casinos and operating hours. Colorado introduced a lighter version of regulation in 2009, raising the maximum table wager from \$5 to \$100, increasing the number of table games, and allowing casinos to operate 24 hours a day (Colorado State Department, 2010).

As a means of economic revitalization, the Korean government legalized gaming for domestic citizens in December 1995, and, Kangwon Land opened a casino in October 2000 and expanded in March 2003. When Kangwon Land opened its first casino, it had only 30 table games and 480 slot machines. Kangwon Land recorded 2,464 visitors and US\$ 1.2 million in revenue per day in 2001 and 10 years later, the numbers bounced up to 8,342 visitors and US\$ 3.8 million in daily operation in 2009. It is a remarkable leap when this number is converted to annual sales volume, which is estimated to be US\$ 1.0 billion for 2009 (Ministry of Culture, Sports and Tourism, 2010a). Considering that Las Vegas strip has recorded US\$ 5.3 billion with 38 locations last year (Nevada Gaming Control Board, 2010a), it would be interesting to know how a gaming company in Korea could make such prosperous numbers. The main reason why Kangwon Land has maintained such high profitability could be explained by its exclusive position due to the non existence of competitors. Since its opening in 2000, Kangwon Land maintained its dominance within the industry by operating the one and only casino in Korea that admits visitors without nationality restrictions.

### **Purpose of the Study**

Kangwon Land has been showing compound annual growth rate (CAGR) of 11-14% both in revenue and visitor's volume so far in spite of the global economic recession (Kangwon Land Casino, 2010b). However, the monopoly status will expire in 2015 by the government regulation (Kangwon Land Casino, 2010a). Yet, can Kangwon Land sustain unabated growth? Will the revenue growth slow as the casino visitors would stabilize as a proportion of the population? This study will examine whether the future revenue growth of Kangwon Land is sustainable by forecasting the casino spending with

a revenue forecasting model.

In an attempt to measure the future Kangwon Land revenue growth in context of visitor's spending, this paper has several objectives. The first is to review Korean casino industry as well as to summarize the structure and economic performance of Kangwon Land casino. In doing so, this study also briefly outlines the regulatory environment. Through an examination of Korean casino industry and Kangwon Land casino, perspective can be gained on future opportunities and threats that significantly affect the Kangwon Land's further growth potential. Second, revenue forecasting literature for gaming industry will be reviewed to construct a framework for analyzing the future sustainability of Kangwon Land revenue. This will give an insight to understand the available research methods and a guide in determining a suitable analysis for the study.

After reviewing the related literature, this paper will develop a forecasting model with an intervention analysis based on an autoregressive integrated moving average (ARIMA) method, using table games drop as an indicator of overall gaming demand. These predicted data will be compared with the actual table games drop for the model fitness. Then, the predicted table games drop will be divided by the number of visitors to forecast the visitor's spending. The results of this study will be meaningful for both casino managers and government law makers to understand the existing domestic casino operations with monopoly status to forecast casino revenues for the possible new casinos, and to determine sustainability in changing market.

### **Justification**

Forecasting future revenue growth potential is a core business practice necessary to sustain competitive advantage. The secondary data used for a forecasting model in this

study, visitor's spending, can be a priceless strategic asset to Kangwon Land because it represents the history of its interactions with customers. Kangwon Land can realize the potential business value while it analyzes visitor's spending pattern: the findings will reveal possibilities of the demographic shifts and changes in what customer wants.

Further study can also help the company on determining where performance can improve and what factors drive performance. As the Korean domestic casino market matured, prediction of revenue growth will give insight on avoiding unnecessary risk in the future.

Despite the importance of forecasting revenue growth, relatively few empirical studies examined whether the casino revenue would grow or level off. Furthermore, previous studies are mostly on market level research. This exploratory study will be helpful for a casino which attempts to assess the further revenue growth in property level.

## CHAPTER 2

### REVIEW OF RELATED LITERATURE

#### **Korean Gambling Industry**

To understand the current position of Kangwon Land in gambling industry, it is meaningful to review the entire Korean gambling industry first. As it has exclusive rights on Korean passport holders, Kangwon Land competes not only with casinos allowing foreign visitors, but also with other legal gambling such as horse racing, boat racing, cycle racing and the lottery company. Horse racing has been legal since 1954, the oldest form of legal gambling in Korea. Although its market share has been decreasing as other gambling sectors grow, it still has the greatest sales volume of 44% among the total gambling revenue (The National Gaming Control Commission, 2010). Following horse racing, lottery and cycle racing have the significant market share, 14.9% and 13.5% respectively.

Table 1 details the revenue and percentage among the total gambling industry by different gambling types between 2001 and 2009. Kangwon Land revenue has more than doubled since its opening, however, it accounted for only 7% of the gambling industry's total revenue last year. In the more mature commercial casino industry of the United States, casino gambling accounted for 37.3% of the total gross gambling revenue in 2007 (American Gaming Association, 2009). Another mature casino market like Australia, casino gambling including electronic gaming machine parlors consisted of 76% of the total gambling revenue (Australian Casino Association, 2009). Considering that the Korean domestic casino has only 10 years of history, it seems like Kangwon Land has the



potential for further revenue growth and market share within the Korean gambling industry.

Table 1

*Overview of Korean Gambling Industry Revenue by Gambling Types*

Year	2001		2009		% Change
	Revenue	(%)	Revenue	(%)	
Horse Racing	\$ 5,469 million	62.40	\$ 6,624 million	44.1	(18.3)
Cycle Racing	\$ 1,889 million	21.50	\$ 2,022 million	13.5	(8.0)
Boat Racing	-	-	\$ 653 million	4.3	4.3
Lottery	\$ 646 million	7.40	\$ 2,246 million	14.9	7.5
Sports Wagering	\$ 4 million	0.04	\$ 1,599 million	10.6	10.5
Foreigner-Only Casino	\$ 348 million	4.00	\$ 836 million	5.6	1.6
Kangwon Land	\$ 413 million	4.70	\$ 1,050 million	7.0	2.3
Total	\$ 8,769 million	100.00	\$ 15,030 million	100.0	-

*Note.* From “Korean gambling industry report,” by The National Gaming Control Commission, 2010.

### **Korean Casino Industry**

The public attitude of Korean citizens toward casino gambling has seen gambling as an inevitable vice (Kim, 2005). Cabot (1996) said that this type of public attitude helped to justify casino gambling legalization either because illegal gambling has an even bigger negative impact on society or because the benefits of legalization compensate for

the costs. Thus, they focus on minimizing the negative impacts of gambling to society (Cabot, 1996). Although Korea legalized casinos in 1962, the industry has grown slowly with strict government regulation (Lee & Back, 2006). It was not until 1994 that the casino industry was considered a part of the tourism sector under Tourism Development Law, designed to encourage the tourism industry including casinos (Kim, 2000). The above attitude toward gambling often supports a model that involves intense regulation to protect the gambler (Cabot, 1996).

This model applies to Kangwon Land that cannot engage in exploitation by encouraging gambling. For example, Kangwon Land is not allowed to advertise within the country, has to limit the number of entry day for local residents, and the betting limit and number of gaming devices are restricted by government. However, the Korean government seeks to fully utilize the economic benefits of foreigner-only casinos. This is a typical form of hybrid model which occurs when the government has conflicting ideas on casinos: they are willing to take the benefits of casino gambling but anxious of negative impacts to its citizens (Cabot, 1996). The Korean government attempts to accomplish the latter goal by restricting or prohibiting access by local residents. Other jurisdictions have implemented similar measures such as Puerto Rico, which prohibits casinos from stimulating demand within the country by advertising. In Korea, the current two-tiered casino entrance regulation reflects in these conflicts. The Korean legislature imposed high tax rates to maximize economic and social benefits. Casino licenses are very limited as they are issued depending on the size of the inbound tourism market since gambling is illegal for Koreans except at Kangwon Land.

Korean casino industry operations are characterized by economics of large scale production similar to Nevada. In Nevada, the largest 44 operations accounted for more than 80% of the State's gross gaming revenue out of 1,400 gaming licenses held in the state (Eadington, 1982). In more recent figures, 20 publicly traded corporations accounted for 77.8% of the total gaming revenue in 2009 (Stutz, 2010). In Korea, 4 casinos out of 17 accounted for 87.7% of the nation's total gross gaming revenue in 2009 (Ministry of Culture, Sports and Tourism, 2010a). The foreigner-only casinos in Korea have been dependent on Japanese inbound tourists, but with the liberalization of Chinese individual tourists, Japanese casino customers are less than 50% of the total, and, the number of Chinese outbound tourists has been increasing substantially.

Table 2 compares the detailed casino operations of foreigner-only casinos to Kangwon Land casino. According to the table, the number of visitors to Kangwon Land is almost double those of foreigner-only casinos. This is obvious from the number of table games and slot machines, which average only 36 and 55 respectively for each foreigner-only casino. Unlike Nevada or Macau, where the casino operators can change the number of gaming devices depending on market demand and supply, it is difficult to acquire the Korean government's approval on expanding the number of table games or slot machines once they are licensed. According to the casino regulation, there are four procedures such as registration, authorization, declaration, and approval. Other types of tourism business only need either registration or authorization. However, casino business must follow all of the four procedures (Lee & Back, 2006). Above all, approval is the toughest procedure. Furthermore, only 3 out of 16 foreigner-only casinos operate a casino in their own hotel, the rest of them rent space in a hotel. It makes these casinos lacking in

amenities commonly associated with top-notch casino gaming such as a variety of world-class entertainment, restaurants and retail shops. The current Asian casino industry is very dynamic and rapidly evolving, with the unprecedented success of Macau and new integrated casino resorts in Singapore. If the Korean government expands the casino industry in the future, they will help to promote the international tourism and they will be poised to capitalize on its greater potential revenue.

Table 2

*Overview of Korean Casino Industry*

<b>Casino Type</b>	<b>Foreigner-only (16 casinos)</b>	<b>Kangwon Land (1 casino)</b>	<b>Total (17 casinos)</b>
Revenue (Million)	\$ 836	\$ 1,049	\$ 1,885
Visitors (Thousand)	1,676	3,045	4,721
Employees*	3,713	1,612	5,325
Table Games	575	132	707
Slot Machines	872	960	1,832

*Note.* From “2009 Annual Gambling Statistics,” by Ministry of Culture, Sports and Tourism, 2010a.

\*Casino employees only.

## **Kangwon Land Casino**

### **History**

There are currently 17 casinos (16 foreigner-only and 1 domestic) operating in Korea. The legalization of the domestic entry casino was made because of the typical reasons that new casinos are introduced: job creation, revenue generation, and economic

development (Gushin, 2006). Like Colorado, Kangwon province where Kangwon Land is located, was well known as a coal mining area. It once experienced a “coal rush” when coal was used as a major national energy source during 1970 to 1980s. The Kangwon province had experienced devastating economic downturns since coal was replaced by gas and oil in the 90s. The Korean government tried to introduce several alternatives to revitalize the local economy, but the community repeatedly and vigorously requested a domestic casino, and it became authorized in December 1995 (Lee & Back, 2006). In October 2000, Kangwon Land opened its doors to Korean citizens as well as to international tourists, and expanded its facilities in 2003. While the foreigner-only casinos have been operating in accordance with the Casino Business Compliance Articles of Tourism Promotion Act, Kangwon Land maintains a monopoly status under a higher law, the Special Law on Closed Coalmine Area Development and Support (Kangwon Land Casino, 2004). Under the same law, the government imposed strict operational regulations such as changes in the number of gaming devices, betting limit, and business hours to protect the citizens from possible negative impacts. Kangwon land is a result of combined efforts by the national government and the provincial office of Kangwon-do, 51% of Kangwon Land shares are owned by four local governments and the Korea Mine Reclamation Corporation under the supervision of the Ministry of Knowledge Economy (Kangwon Land, n.d.). Hence, Kangwon Land has to practice a fair and transparent operation to keep the government level credit rating. At the same time, as a listed company Kangwon Land is responsible to their shareholders who must get a fair return on its investment.

## **Operation**

In October 2000, when Kangwon Land first opened, it had one hotel with 199 rooms and a casino that had only 30 table games and 480 slot machines. To ensure sustainability and to diversify revenue resources, Kangwon Land initiated its first step in transforming itself into the resort-style tourist destination in March 2003 (Kangwon Land Casino, 2005). This was an effort to break away from its casino-oriented business and hence improve its brand image. Kangwon Land tried to overcome the limited role as the “hope of the closed coalmine area” and hoped to lead the domestic tourism industry with world-class resort facilities.

Today, Kangwon Land operates 2 hotels with 674 rooms, 2 condominiums with 403 rooms, an 18-hole golf course, a ski resort with 18 slopes, and a casino with 132 table games and 960 slot machines on 2,800 acres of land (Kangwon Land Casino, 2009). The effort to diversify sales continues today, as Kangwon Land is constructing a new convention hotel and 2 more condominiums. A new water park is scheduled to open in 2015 to complete the family-oriented year round comprehensive resort.

Kangwon Land ranks 218<sup>th</sup> in operational size, 352<sup>nd</sup> in number of slot machines and 36<sup>th</sup> in number of table games worldwide according to Casino City’s Gaming Business Directory (Casino City, 2010). Table 3 shows Kangwon Land compared to the 5 largest casino companies in the world by number of gaming devices.

## **Regulatory issues**

The Korean government believes that the casino industry is a double-edged sword that brings economic benefits while endangering the welfare of its domestic citizens. The majority of experts on the casino industry refer to Singapore as a case of

severe regulatory environment. Yet, Korea’s regulations are in some ways even more restrictive. The Singapore government seeks to encourage casino business while protecting its own citizens. In contrast, the priority of the Korean government is to protect citizens rather than ensuring industry’s sustainability. The detailed comparison of casino operational regulation between Kangwon Land and Singapore is given on Table 4.

Table 3

*World’s top 5 gaming properties with gaming positions ranked in order by the number of positions and Kangwon Land*

<b>Rank</b>	<b>Number of Positions</b>	<b>Casino</b>	<b>Location</b>
1	9,480	Foxwoods Resort Casino	Mashantucket, Connecticut
2	9,132	Mohegan Sun Casino	Uncasville, Connecticut
3	8,220	The Venetian Macao	Taipa, Macao
4	6,750	Sands Macao	Macao, Macao
5	6,592	Bally’s Atlantic City	Atlantic City, New Jersey
218	1,752	Kangwon Land Casino	Kangwon, Korea

*Note.* From “Casino City’s Gaming Business Directory Summer 2009 Edition,” by A Casino City press publication, 2010. A gaming machine is considered one gaming position and a table game or poker table is considered six gaming positions.

The comparison demonstrates how the Korean government is more inclined to protect citizens from possible negative impacts in terms of casino regulation. For example,

Korean nationals can enter the casino only 15 days a month both for the general public gaming area and for VIP areas. To protect the local residents who live near Kangwon Land, the residents from 4 neighboring cities of the casino can enter only once per month. For the general area, only two types of table are allowed with maximum bet of \$91 or \$273 respectively. For VIP customers, maximum table limit is \$9,090. For the general public floor, 50% of table games must set a betting limit of \$91 per bet. Kangwon Land needs the government's approval to change the betting limit, and it has not happened for 10 years. Kangwon Land also needs to close the casino 4 hours a day during the weekday. In fact, all these regulations on a casino operation fail to hamper the growth either in revenue or the number of visitors to Kangwon Land. Kangwon Land still enjoys profits that are higher than industry average due to the latent demand and being the only supplier.

Before Kangwon Land, illegal slot machines thrived, and no protection was provided to the citizens as they were not regulated. Since Kangwon Land is under the stringent casino regulations, it can benefit from public credibility as a government invested company. Also the regulations create barriers to entry that make it difficult for other casino companies to open new domestic casinos. As long as the Korean casino industry faces adverse publicity and the government does not address the regulation inefficiencies, the lighter version of casino regulations will not come in effect in near future.



Table 4

*Regulation comparison between Kangwon Land and Singapore*

	<b>Kangwon Land</b>	<b>Singapore</b>
Entry	Maximum 15 days per month Local residents from 4 cities near Kangwon Land can enter once a month	No limitation
Entry levy	\$ 5	SDG 100 for 24 hours or SGD 2,000 for annual entry for 10 years
Self-exclusion	Self-exclusion program by customer him/herself or family member request	Problem gamblers, bankrupts, anyone under government social assistance programs are excluded. Family member request also possible
Operating hours	Close 4 hours a day except for weekend	No fixed opening hours
ATM	Allowed in gaming floor	Prohibited within the casino
Number of gaming machine	Government approval	Not exceed 2,500 per casino
Gaming Area	Government approval	Maximum 15,000 square meters
Credit	No credit allowed	No credit except for VIPs
Advertisement	No casino advertisement	No promotional activities aimed at locals

*Note.* From “The Tourism Development Law,” by Ministry of Culture, Sports and Tourism, 2010b.  
“Casino Regulation,” by Casino Regulatory Authority Singapore, 2010.

### **Performance**

Kangwon province where Kangwon Land is located is in a northern mountain area 3 hours from Seoul, the capital city of Korea. When the government granted the monopoly status to Kangwon Land, the road was not ideal conditions with no direct highway access. In spite of this, the success of Kangwon Land has been remarkable until

now. Kangwon Land recorded \$412 million in gross revenue and 209,000 visitors in 2001. Both the revenue and number of visitors were more than doubled in 9 years. The revenue reached \$1 billion and visitors exceeded 3 million in 2009 (Ministry of Culture, Sports and Tourism, 2010a). The compound annual growth rate (CAGR) from 2001 to 2009 for revenue was 11%, and for visitors it was 14%. Kangwon Land has maintained high profitability every year.

However, it is notable to see that its growth and profitability suffered due to the side-effects of the illegal gaming markets in 2006 (Kangwon Land Casino, 2007). The illegal gaming markets describe the proliferation of illegally programmed video machine parlor. The Korean government allowed adult-only video game arcades which could award gift certificates as prizes in 2002. The use of gift certificates was strictly limited to purchase books, recorded music, and tickets for performing arts and movies. However, the gaming machines in arcades were illegally reprogrammed by the owner of arcades to allow higher winnings, attracted lots of customers in major cities of Korea (Kim, 2009). The government banned the use of gift certificate in 2007. Table 5 details the performance of Kangwon Land since its opening.

Table 6 describes the comparison between Kangwon Land, and the Las Vegas strip by the number of gaming devices and revenue. According to Table 6, the higher profitability of Kangwon Land can be explained by two factors: a higher win percentage and the win per unit per day (WPUD). WPUD is calculated by dividing the total gaming win by the total number of units. The daily table games WPUD for Kangwon Land exceeds \$16,000, and it is 8 times higher than those of Las Vegas strip casinos. Win percentage for table games is higher than strip casinos average by 4%.

Table 5

*Overview of Kangwon Land performance*

<b>Year</b>	<b>Revenue (Million)</b>	<b>YOY %P</b>	<b>Number of Visitors</b>	<b>YOY %P</b>
2001*	\$412		899,590	
2002	\$426	3	918,698	2
2003	\$596	40	1,547,847	68
2004	\$670	12	1,784,730	15
2005	\$736	10	1,881,559	5
2006	\$729	-1	1,793,746	-5
2007	\$882	21	2,451,920	37
2008	\$969	10	2,914,684	19
2009	\$1,049	8	3,044,972	4

*Note.* From “2009 Annual gambling statistics,” by Ministry of Culture, Sports and Tourism, 2010a. 2000 data is not included as Kangwon Land opened in October 28, 2000.

WPUD of slot machines are less significant than table games, still it is almost 4 times higher than that of strip casinos. The higher WPUD explains the overwhelming performance in terms of revenue of Kangwon Land, however, there is little speculation on the higher WPUD. One of the possible explanations is decreased supply elasticity due to the excessive demand. The number of total gaming devices in Kangwon Land cannot successfully accommodate the daily casino visitors, hence there are average of 15-20 peoples playing in one table game at the same time (Kangwon Land Casino, 2008). As long as Kangwon Land does not have autonomy on controlling the number of gaming devices, the discrepancy between the supply and demand will continue for times.

Table 6

*Comparison between Kangwon Land and LV strip casinos*

	<b>Kangwon Land</b>	<b>LV strip (38 locations)</b>
Table Games		
Win	\$774,818,000	\$2,656,451,000
Win %	15.8%	11.7%
# of Units	132	2,736
Win per unit per day (WPUD)	\$16,082	\$2,660
Slot Machines		
Win	\$240,800,000	\$2,808,617,000
Win %	7.7%	7.1%
# of Units	960	49,476
Win per unit per day (WPUD)	\$625	\$155

*Note.* From “2009 Annual report,” by Kangwon Land, 2010. “Nevada gaming revenue 2009,” by Nevada Gaming Control Board, 2010.

The remarkable performance of Kangwon Land is achieved through casino sector which consists of 95.5% of total gross revenue (Kangwon Land Casino, 2009). The non-gaming sector accounted for 1.9% in 2004 before the opening of a golf course and ski resort (Kangwon Land Casino, 2004). Comparatively, Las Vegas strip casino revenue contributed only 38.7% to the total revenue including non-gaming sector (Center for Gaming Research, 2010). The higher dependency of casino revenue can cause structural vulnerability when sustainability of casino business is threatened by the possible competitors in the future. Although Kangwon Land focused on increasing non-gaming facilities to diversify the revenue source, it was not successful due to the geographical

disadvantage. Since the monopoly status is only guaranteed for a limited time, it is questionable whether Kangwon Land can sustain the same profitability.

### **Customer demography**

Due to the monopoly status and lack of easy access from the airport, Kangwon Land's customers consist of 98.9% of Korean national and 1.1% of foreign tourist (Kangwon Land Casino, 2010b). As described in regulatory issues, the ban of advertisement also makes it harder to be recognized by foreign individual tourists. Kangwon Land is expecting to have more foreigners from the Southeast region with the nation's longest ski slopes during the winter season. Still the geographical disadvantage works as an obstacle to attract more visitors. Among the domestic customers, VIP customers accounted for 2% of the total number of visitors. The number is considerable given that the revenue from VIP table games consists of 20% of the total casino revenue. As Kangwon Land cannot decide the number of VIP table games without prior approval from Ministry of Culture, Sports and Tourism, any significant change to the number of VIP customers can affect the gross revenue substantially. In that, the massive expansion of Macau casino industry and its aggressive marketing on Korean nationals is a great threat to Kangwon Land casino's VIP market (Kangwon Land Casino, 2006). Table 7 indicates the decrease in VIP table game volume from 2008. The condition can be exacerbated by the introduction of the new integrated resorts in Singapore this year. The future sustainability of Kangwon Land can be affected further if Japan ever manages to legalize casino gaming in its domestic market, as Japan is within 1 hour flight distance from Korea. There is a plausible possibility that VIP customers could fly to Japan where their anonymity can be guaranteed.

Table 7

*Kangwon Land revenue breakdown*

<b>Year</b>	<b>2009</b>	<b>2008</b>	<b><u>YOY</u> <u>%P</u></b>
General Table	50.5%	52.6%	-2.1
VIP Table	20.8%	23.2%	-2.4
Slot Machine	24.2%	19.7%	-4.5
Non-gaming	4.5%	4.5%	0

*Note.* From “2009 Annual report,” by Kangwon Land, 2010a. “2008 Annual report,” by Kangwon Land, 2009.

## **Economic Impacts of Kangwon Land Casino**

### **Tax revenue and job creation**

There has been little research available about the impacts of Kangwon Land casino on national government, local government, and communities. However, Lee and Lee (2010) studied the economic impacts of Kangwon Land casino on the province and other regions. The study employed a regional input-output (I-O) model to estimate the impacts. According to the study, Kangwon Land generated \$1.9 billion of direct and indirect effects, which is 77.5% for intra-region and 22.5% for other regions (Lee & Lee, 2010). Results also indicated \$311 million in income impacts and \$1 billion of value-added impact (Lee, & Lee, 2010). Since its opening, the total amount of tax to the government has accumulated to \$2.4 billion for 10 years operation, and both 21,118 non-paid and full-time jobs were created (Oh, 2010). Approximately 70% of total Kangwon Land employees were local residents to help them to maintain local household economy (Kangwon Land Casino, 2007).

It is meaningful to compare the economic impacts study results to the estimated impact study of casino operation to determine whether Kangwon Land is meeting its expectations or not. As the nature of input-output model utilized existing data to deliver the impacts, the related study using the same methodology was not available. However, Han et al. employed time series analysis to forecast the demand, revenue and the tax generation of domestic casino in 1997. The study forecasted the number of visitors to Kangwon Land according to the survey and visitors arrival in closed mining area. The study predicted 500,000 would visit Kangwon Land in 2001 and the number would be increased to 1.5 million in 2009. Kangwon Land recorded 3 million visitors in 2009, which was double the prediction. The study also forecasted that the tax generation for 10 years operation of Kangwon Land would be \$341 million, the actual amount of tax to the government was \$2.4 billion, 7 times higher than expectation (Han & Cho, 1997).

### **Negative impacts**

When a casino is introduced in a community, the residents can suffer from gambling addiction, increased crime rate, prostitution and traffic congestion (Lee & Back, 2009). The high profitability of Kangwon Land and its high WPUD can lead to speculation of problem gambling. Compare to Las Vegas strip casinos, higher WPUD might imply that casino customers cannot control their budget and time effectively. In fact, the number of pawnshops has increased rapidly since Kangwon Land opened. To address this issue, Kangwon Land established Gambling Addiction Prevention & Counseling Center both in capital area and on site. Still, Kangwon Land is not free from accusation of increased gambling problem nationwide. A lawmaker has reported that a total of 35 people committed suicide over gambling debt and addiction problems (Kim,

2009) since Kangwon Land opened in the region. The fact that concerned government changed the entrance day limit from 20 days per month to 15 days starting from January 2010 supports the importance of dealing with negative impacts for Kangwon Land. The atmosphere of requesting severe regulation can be raised if Kangwon Land does not devote itself to prevention of problem gambling.

## **Future Opportunity and Threat**

### **Opportunity**

Kangwon Land has secured its prosperity in the relatively short period of ten years. However, there is a chance that the company can fall into complacency if it does not proactively respond to the ever-changing business environment. Kangwon Land recently announced a new development plan which includes luxury condominiums with a capacity of 500 rooms, a 250-room convention hotel, and a world-class water park.

Kangwon Land tries to diversify its monopolized customer base through attracting more ski customers from the Southeast region. The ski resort has Korea's longest slope, and outstanding snow quality as it favorably located high above sea level. Kangwon Land could benefit the most from the fact that the ski resort selected as the most preferred ski resort for two consecutive years at the survey conducted by the Korea Management Association Consultants (Kangwon Land Casino, 2009). As the number of inbound tourists increase year by year, the ski resort is deemed to be the new revenue center to host customer's need from China.

Further, one of the biggest opportunities that the company could benefit is that Kangwon Land has the "first mover" advantage in Korea and the size and scale of the operations and the experienced management team. As described in Korea gambling



industry, the Korean casino markets are significantly under penetrated, and there is enough room in the market to support new developments. Although there is currently no sign of introducing another domestic casino in near future, over the long term Korea could consider introducing a new domestic casino. Even if that should happen, Kangwon Land will dominate Korean casino market as a primary operator with its experience in casino market and financial flexibility.

### **Threat**

Although Kangwon Land has benefited from the fact that it has monopoly status, this opportunity does not come without risks. As the company has already showed that it lost its high-rollers to the competition from Macau, the introduction of another domestic casino could prove deadly for the company. Now it is facing the monopoly to end by 2015. Liberalization of domestic entry casinos has been controversial and other local governments who envy the higher tax rate of Kangwon province are lobbying to the government for liberalization insisting that it is not a fair practice to allow one company to have a monopoly. To maintain a primary position, Kangwon Land has an ongoing dialogue with legislatures about future expansion. Still it is not likely to happen in near future.

The other concern is that Kangwon Land has the fundamental weakness within the company. As a government invested company, the CEO as well as other key executives has to be replaced on a three-year term basis by the regulation. It can make the executives vulnerable to play a key role in the financial decline and tourism faltering situation. It can also induce the ill-timed business decision that affects the company's continuity of the business operations in the event of an unexpected disruption.

More importantly, there is a possibility that the government could impose more stringent gaming regulation that seriously affects its business operations. The government has already imposed relatively tough regulations on the domestic casino to control the casino business due to the negative factors of gambling. The possibility is even higher with the newly introduced National Gaming Control Commission, as they try to limit the total sales of the gambling industry and to introduce an e-card system which can track every wagering activity. The current over-dependence on casino revenue will jeopardize the company's future sustainability unless it does its best to create an optimal balance between the gaming and non-gaming sector revenues.

### **Forecasting Gaming Revenue**

After reviewing Korean gambling industry and Kangwon Land to gain an understanding of current operation, future opportunity and threat which significantly affect the further sustainability of the company, a review of gaming revenue forecasting literature was conducted. The review of forecasting related literature compared various analysis in gaming industry in effort of finding suitable application in predicting maturity point of Kangwon Land's revenue.

#### **Gaming revenue forecasting**

Cargill and Eadington (1978) published the forecasting research for taxable gaming revenue. Although this research was conducted almost 40 years ago, it was notable that the authors tried to compare the various forecasting method including econometric models, regression and the Box-Jenkins technique. This study stressed the importance of choosing the suitable prediction model depending on the data characteristics. This study implied three important applications to the study of Kangwon

Land. First, the study investigated the seasonal fluctuation and patterns to understand the time varying characteristics of gaming revenue. It also examined the systematic nonseasonal movements that have to be isolated in gaming revenue for the fine results. Second, this study employed a multiple regression analysis to estimate the causal relationships between gaming revenues and other variables including California personal income, national recessions and for the 1973-1974 energy crises. Third, it applied Box-Jenkins method to develop a forecasting model. According to the study, both naïve and regression model yield significant results (Cargill & Eadington, 1978). However, it is difficult to determine whether the results are derived by cause-effect relationship or not. Thus the study concluded the Box-Jenkins model approach provided the adequate basis for forecasting methodology.

In a recent study, Mellen and Okada (2006) tried to forecast market-wide gaming win for Macau. This study is meaningful in that Macau gaming industry experienced the dramatic growth in gaming volumes over the relatively short period. This study gave a perspective on how Kangwon Land is similar to Macau market in four ways. First of all, this study pointed out that Macau benefited from monopoly in market level as it's the only supplier in China with legal casino gaming (Mellen, & Okada, 2006). It also mentioned that Macau gaming market is driven by supply so that any significant addition can be absorbed (Mellen, & Okada, 2006). Thirdly, the high Win per Unit per Day (WPUD) is explained by the market's monopoly status. Lastly, the growth in the number of visitors has direct positive correlation with gaming revenue growth. In order to develop forecasting model, the study employed econometric modeling. They assumed 2 % annual growth rate for Win per Visitor Day (WPVD), and the number of

visitors to Macau will increase to 34.8 million by 2012 as a conclusion. The study also assumed that the percentage of visitors that stay overnight would level off by 2011, and the length of visitor stay would be stabilized by 2009.

As a result, the actual number of visitors is less than those of the predicted as the study assumed an equal percentage of increase each year, but the actual revenue is higher than they expected. Table 8 shows the comparison between the predicted data and the actual number of visitors and revenue. The naïve approach gives the most cost-effective and efficient objective forecasting model for some industries (Heizer & Render, 2006). However, the assumptions associated with projection would have to be provided by industry experts. Otherwise this forecasting approach can be misleading. Although there are lots of similarities found between Kangwon Land and Macau market, the restrictions associated with using econometric modeling make this approach impractical for examining the future revenue growth potential of Kangwon Land.

### **Impact of intervention study**

Eisendrath (2005) attempted to quantify the decrease in slot machine coin-in after the events of September 11, 2001. This study is meaningful in that it used intervention analysis based on autoregressive integrated moving average (ARIMA) model to estimate the length and intensity of the downturn for Las Vegas casinos. As Kangwon Land increases the operational capability significantly in 2003 with opening of main casino, the period before the opening and the after cannot employ the same forecasting model. This study used dummy variables which have been successfully used on studies involving Las Vegas casinos: the first dummy variable accounted for the opening of the Luxor, Treasure Island, and MGM grand. The second dummy variable

accounted for the opening of Bellagio and Mandalay Bay (Eisendrath, 2005). Then the study compared the predicted data to the actual slot machine coin-in. The study also showed that using partial gaming win such as slot machine coin-in can derive satisfactory results for projecting gross gaming volume as the slot machine coin-in explained more than 50% of the total gaming win in Las Vegas area.

Table 8

*Comparison between forecasted vs. actual of Macau gaming industry*

Year	Visitor Arrivals (In thousands)		Gaming Revenue (In millions)	
	Forecasted	Actual	Forecasted	Actual
2005	18,621	18,711	\$ 5,755	\$ 5,936
2006	21,039	21,998	\$ 6,771	\$ 7,299
2007	24,046	26,993	\$ 8,552	\$ 10,702
2008	27,584	21,753	\$ 10,650	\$ 14,021
2009	29,874	22,933	\$ 12,839	\$ 15,388
2010	31,637	-	\$ 13,877	-
2011	33,193	-	\$ 14,860	-
2012	34,831	-	\$ 15,915	-

*Note.* From “Forecasting market-wide gaming revenue (win) for the Macau special administrative region,” by Mellen, & Okada, 2006. “Gaming statistics,” by Gaming Inspection and Coordination Bureau Macau SAR, Retrieved October 16, 2010 from <http://www.dicj.gov.mo/web/en/information/DadosEstat/2009/content.html#n1>  
“Visitor arrivals,” by Macau Government Tourist Office, Retrieved October 16, 2010 from [http://industry.macautourism.gov.mo/en/Statistics\\_and\\_Studies/list\\_statistics.php?id=29&year=2009&page\\_id=10](http://industry.macautourism.gov.mo/en/Statistics_and_Studies/list_statistics.php?id=29&year=2009&page_id=10)

### **Market maturity study with life cycle model**

Revenue forecasting was developed to determine the casino industry's market trend for both emerging and established casino market. However, little research was conducted on estimating sustainability of revenue growth in gaming industry. Forecasting maturity point of gaming market has a significant meaning for industry itself and for policy makers. It is especially important to policy makers when they have to measure the new casino entrants or existing operations. Two possible outcomes were derived concerning introduction of the new casino. As to market level, introducing the new casino entity could increase the market share of national gaming revenues (Marfels, 1999). For property level, individual casino might suffer from the new competition in terms of decreased market share (Lowenhar, Repsher, & Taylor, 1999). Regardless the emergence of competitors, most mature casino market has experienced up and down depending on market demand and supply over times. Three notable studies employed life cycle approach to estimate the market mature point of gaming industry.

Moss, Ryan, and Wagoner (2003) tested Butler's Resort Product Life Cycle with empirical data from Mississippi gaming industry. This study used time-series decomposition with polynomial regression to forecast the gross gaming revenue and win per square foot per day (Moss et al., 2003). This study is meaningful in that Mississippi follows a Kangwon Land type hybrid model that introduces gambling while discouraging participation of residents. As this study was conducted at market level, it concluded win per square foot per day decreased as more casinos were added in the region. The study also concluded that the Mississippi casino industry followed Butler's S-shaped product life cycle (see Table 9). As the forecasted growth model indicated that the market already

reached the maturity point (Stage 5), the further growth is not plausible. Although this study suggested a meaningful methodology to estimate a maturity point, the difference between market level and property level research makes it hard to apply to Kanagwon Land study. Also there is difficulty of identifying turning point from one stage to another which turns out to be arbitrary.

Table 9

*Resort property life-cycle stages*

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1. Exploration
2. Involvement
3. Development
4. Consolidation
5. Stagnation
6. Decline
7. Rebirth

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*Note.* From “An empirical test of Butler’s resort product life cycle: forecasting casino winnings,” by Moss, Ryan, & Wagoner, 2003

Chang (1995) attempted to estimate the maturity of the coastal Mississippi region and developed a learning curve model. The equation derived from a learning curve model successfully predicted a trend of gaming revenue in Mississippi casinos which indicated Mississippi casinos in coastal region had reached its revenue maturity point in two years of introduction. The study also suggested that the factors such as the healthy national economy, outside competitions, social value changes toward gaming industry have a significant effect on the maximum gaming revenue.

DeBoer (1986) studied the revenue growth of state lottery to determine when the growth would slow. This paper recognized the sources of rapid growth and the limits of discretionary income to develop a forecast model of lottery revenue growth. DeBoer speculated that the rapid lottery revenue growth should have to level off as the lottery participation would stabilize as a proportion of the population (DeBoer, 1986). To develop a forecast model, he employed the diffusion model variety which using “exponential epochs”. In the diffusion model, it assumed that a new product or innovation followed the exponential growth pattern. Thus, if a forecast revenue growth model fits the diffusion model, the growth would level off at some point as a result of unsustainable participation. Although Chang (1985) and DeBoer (1986) both successfully forecasted the market maturity point, they were impractical to apply to the exploratory study because of the exponential growth pattern assumption.



CHAPTER 3  
METHODOLOGY

**Data Collection**

Secondary data for the study was collected for Kangwon Land casino from October 2000 to June 2008. These data detailed (1) table games drop per day, (2) table games win per day. Total number of casino visitors per day was collected from October 2000 to September 2010. This study will use table games drop of Kangwon Land for the 91 monthly periods and the number of visitors for the 119 periods. Table games drop was chosen as an indicator of overall gaming demand for the following two reasons. Firstly, the predominance of the table games contribution to the overall gaming mix makes it more representative in terms of gaming demand. Table games win accounted for more than 80 percent of the total gaming wins since its opening. Table 10 detailed the table games win percentages versus slot wins to the total gaming wins from 2000 to 2008.

Table 10

Kangwon Land Table vs. Slot Win

Year	Win as % of Total Gaming Win	
	Table Games	Slots
2008 <sup>(a)</sup>	82.7%	17.3%
2007	86.4%	13.6%
2006	89.0%	11.0%
2005	87.5%	12.5%
2004	82.5%	17.5%
2003	77.8%	22.2%
2002	67.0%	33.0%
2001	66.7%	33.3%
2000 <sup>(b)</sup>	64.1%	35.9%

*Note:* (a) Through May 2008. (b) From November to December 2000, by Kangwon Land, 2010a

Secondly, the measure of table games drop represents the total amount of wagering activity for table games (Greenless, 1988). Unlike table win that can fluctuate by the short-term volatility associated with the house advantage (i.e., “luck”), table games drop can be a more accurate measure of gaming demand (Eisendrath, 2005). Previous gambling studies have also recognized the use of table games drop as a better predictor of overall gaming demand (Gu, 1999).

### **Linear Regression Model**

First, the multiple linear regression model (MLR) will be used to find out various components of time series analysis such as trend and seasonality. A primary dependent (y) or a response variable for MLR is table games drop and more than one independent or predictor variables (x) are employed to fit a linear equation below.

$$Y_t = \beta_0 + \beta_1 t + \beta_2 \text{Jan} + \beta_3 \text{Feb} + \beta_4 \text{Mar} + \beta_5 \text{Apr} + \beta_6 \text{May} + \beta_7 \text{June} + \beta_8 \text{July} + \beta_9 \text{Aug} + \beta_{10} \text{Sept} + \beta_{11} \text{Oct} + \beta_{12} \text{Nov} + \beta_{13} \text{DCasino} + \beta_{14} \text{DSkiResort}$$

$$Y_t = \text{Kangwon Land table games drop in Korean Won}$$

Two types of dummy variables are used to reflect the impact of casino facility expansion in April 2003 and opening of ski resort in December 2006. The “t” variable represents the trend component which helps to identify the time varying characteristics of gaming revenue. For example: DCasino = “1 if period after the expansion, 0 otherwise”. The months January – November are treated as seasonal dummy variables. For example: Jan = “1 if period is January, 0 otherwise”. Then, time series regression residuals will be plotted to check the autocorrelation. In MLR model, the assumption is that error terms are independent and normally distributed. The ACF of residuals will be tested to identify the

violation of independence assumption. If the assumption is violated, ARIMA model will be employed to develop a forecasting model for table games drop.

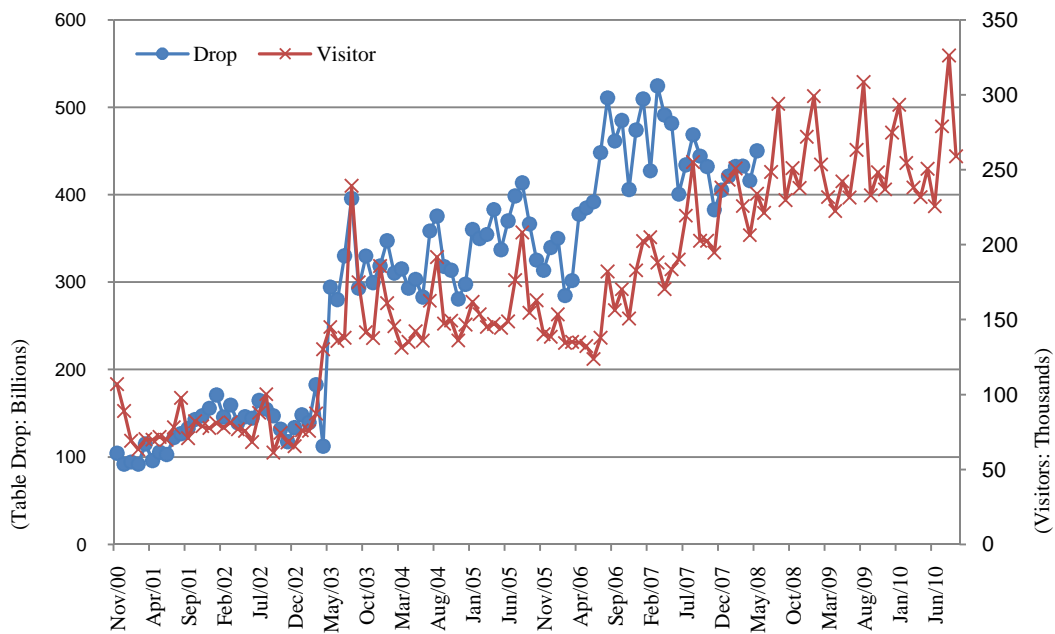
### **Selection of Time Series Model**

Because of the time varying characteristics of gaming revenue, it is necessary to employ an ARIMA model to examine the data. The use of ARIMA model in time series analysis makes it possible to effectively investigate the seasonal fluctuation and trend patterns. It can also isolate the systematic nonseasonal movements, which will enhance the results. Another benefit of using ARIMA model is that it can reflect the effect of an intervention such as a policy change or a new law by including the explanatory variables (Vandaele, 1983). Most importantly, using the ARIMA model has an advantage in that it easily allows you to add terms to correct the model for autocorrelation in the residuals.

### **Research Hypotheses**

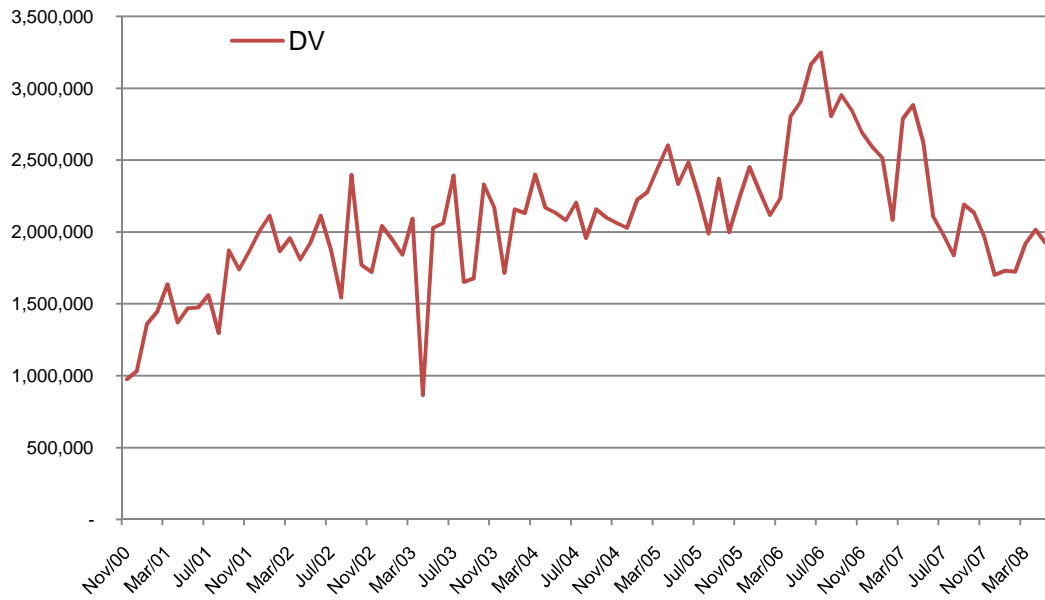
Despite the lack of empirical evidence related to the purpose of this study, directional hypotheses were advanced. Given the conventional theory that the number of visitors drives gaming volume, the number of visitors is expected to have a positive and strong correlation with table games drop. Figure 1 shows that as the number of daily visitors to Kangwon Land increased, table games drop per day has increased. However, if the magnitude of increased visitors is more than those of the increased table games drop, it may imply the decreased amount of expenses per visitors per day. The company may have become less profitable as a result of decreased spending, and it may follow by a leveling of casino's gaming demand. As Kangwon Land is operating the only domestic casino in Korea, the number of visitors and the amount of expense per visitor can be a valuable indicator in measure of further sustainability of revenue growth for the company.

Figure 2 presents the table games drop per visitor per day (DVD). It has shown a steady decline of drop per visitor since June 2006. This study attempted to develop a forecasting model for table games drop and the visitor's spending. Therefore, the primary dependent variables used within the forecasting model were table games drop. Then, forecasted table games drop was divided by the number of visitors in an effort to control for the visitor effect.



*Figure 1.* Monthly table games drop (in billions) and number of visitors per month (in thousands).

Note: Monthly table games drop data included November 2000 to May 2008. Number of visitors per month data included November 2000 to September 2010.



*Figure 2.* Monthly table games drop divided by the number of visitors per month.  
 Note: Monthly table games drop data included November 2000 to May 2008. Number of visitors per month data included November 2000 to May 2008.

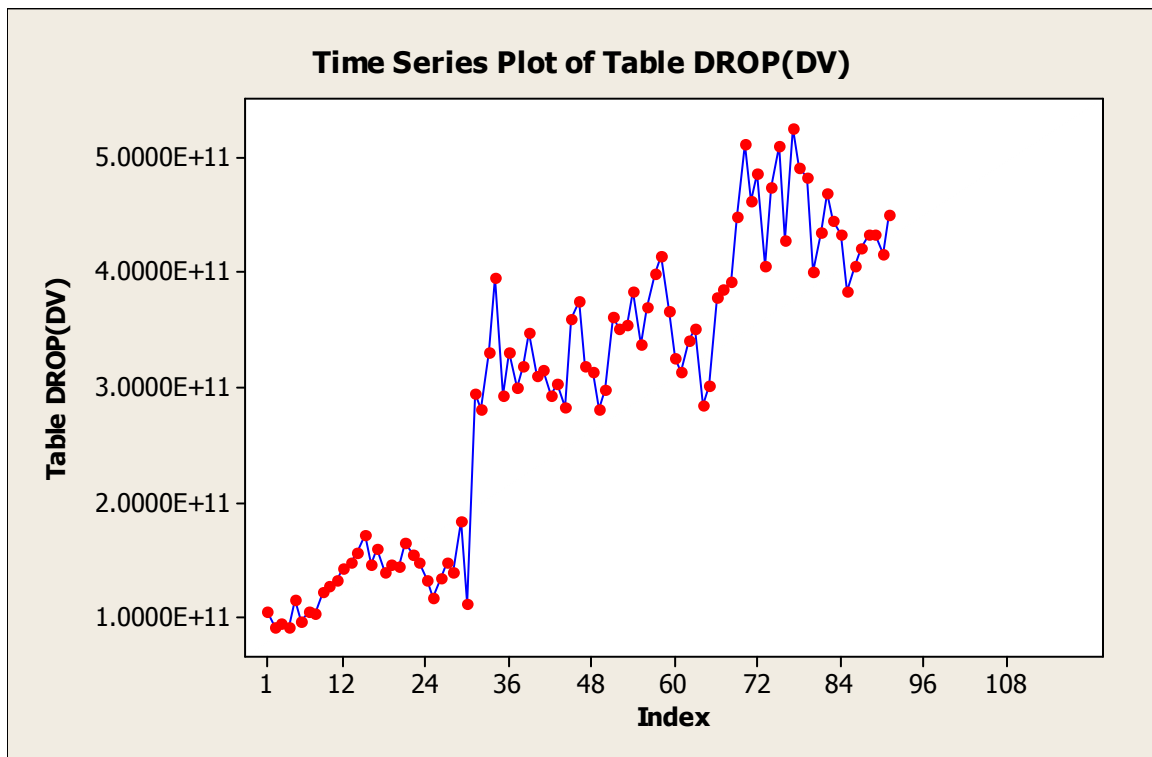
## CHAPTER 4

### DATA ANALYSIS AND FINDINGS

#### Analysis of Data

##### Developing a base model

First, monthly table games drop (a defendant variable, DV) was plotted to examine the trend and seasonality (Figure 3). Second, scatter plot was used to determine the relationship and pattern between table games drop (DV) and one of the primary independent variables (IV), the number of visitors (Figure 4).



*Figure 3.* Time series plot of table games drop (DV).

Note: Monthly table games drop data included November 2000 to May 2008. Index (x) is a sequence of the data. For example: 1 = November 2000.

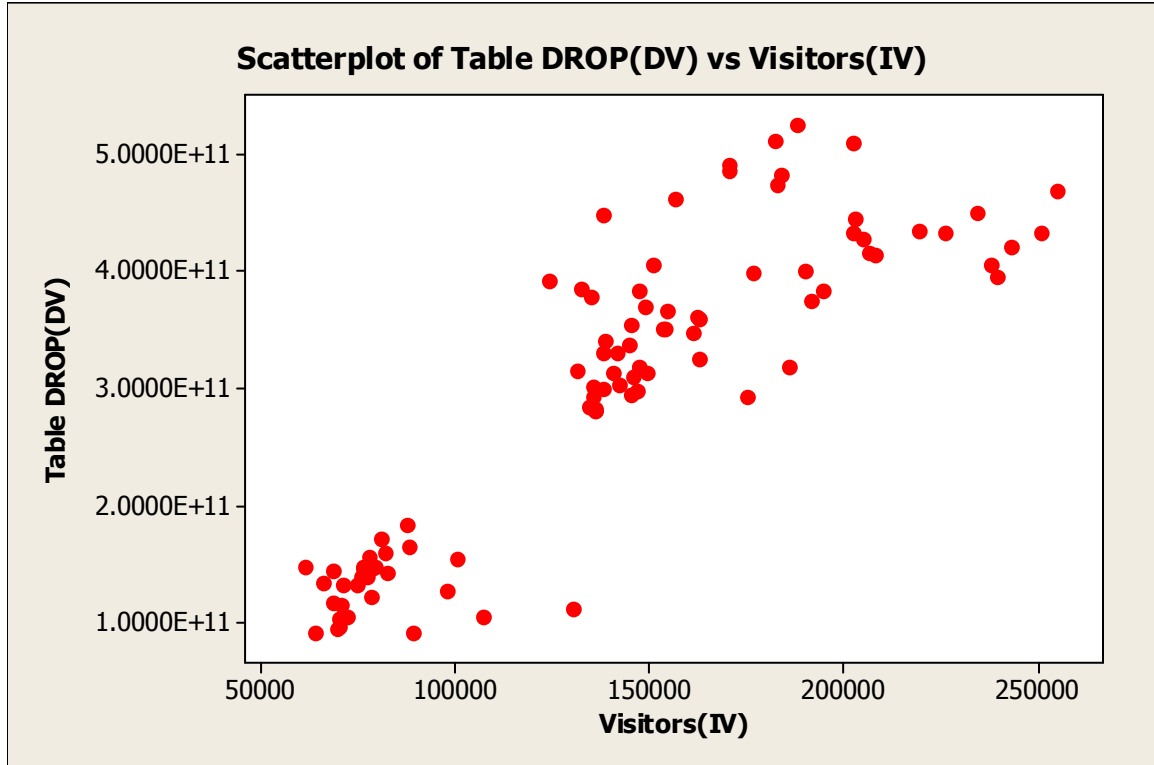


Figure 4. Scatterplot of table games drop (DV) with number of visitors (IV).

Note: Monthly table games drop data included November 2000 to May 2008. Number of visitors per month data included November 2000 to May 2008.

The scatterplot of table games drop (DV) with number of visitors (IV) showed that the points are not randomly scattered over the grid. They were concentrated in a band from the bottom left of the plot to the top right. As the number of visitors increased, so table games drop did. The relationship appeared to be more or less linear. In that, a straight line might be a reasonable summary of the data.

Then, the following regression model was tested by using Minitab 14.

$$Y_t = \beta_0 + \beta_1 t + \beta_2 \text{Jan} + \beta_3 \text{Feb} + \beta_4 \text{Mar} + \beta_5 \text{Apr} + \beta_6 \text{May} + \beta_7 \text{June} + \beta_8 \text{July} + \beta_9 \text{Aug} + \beta_{10} \text{Sept} + \beta_{11} \text{Oct} + \beta_{12} \text{Nov} + \beta_{13} \text{DCasino} + \beta_{14} \text{DSkiResort}$$

The first regression was run to test all the variables identified in the model. This helped to eliminate variables which statistically insignificant. On the second trial, a square of Visitor Volume (VV2) was added since the graph of visitor volume and DV (Figure 4) showed a quadratic relationship. From the first regression, the primary independent variable of number of visitors, August (DAug), trend (t) and VV2 appeared to be statistically significant. Based on the same standard, all other months were eliminated from the regression equation. The selected variables were then tested again with the following results. All terms in the model are significant at any level, except for DAug which is significant at .10 test size.

The regression equation is

$$\text{Table DROP(DV)} = -1.22\text{E}+11 + 3399425 \text{ Visitors(IV)} + 3.10\text{E}+10 \text{ DAug} + 2.79\text{E}+09 \text{ t} - 8.42 \text{ VV2}$$

Predictor	Coef	SE Coef	T	P	VIF
Constant	-1.22029E+11	30987130205	-3.94	0.000	
Visitors(IV)	3399425	485903	7.00	0.000	37.8
DAug	30968364880	17297915741	1.79	0.077	1.3
t	2794132028	330797476	8.45	0.000	4.5
VV2	-8.422	1.472	-5.72	0.000	30.7

$$S = 39156675596 \quad R\text{-Sq} = 91.3\% \quad R\text{-Sq(adj)} = 90.9\%$$

*Figure 5.* Minitab output of final regression equation.

Next, the autocorrelation function (ACF) and partial autocorrelation function (PACF) of the residuals were plotted to determine an appropriate ARIMA model for forecasting. As shown in Figure 6, the ACF dies down quickly. PACF has a spike at lag of 1, and then it cuts off. It showed the presence of an autoregressive (AR) component of 1. This suggested fitting a non seasonal ARIMA (1,0,0) model.



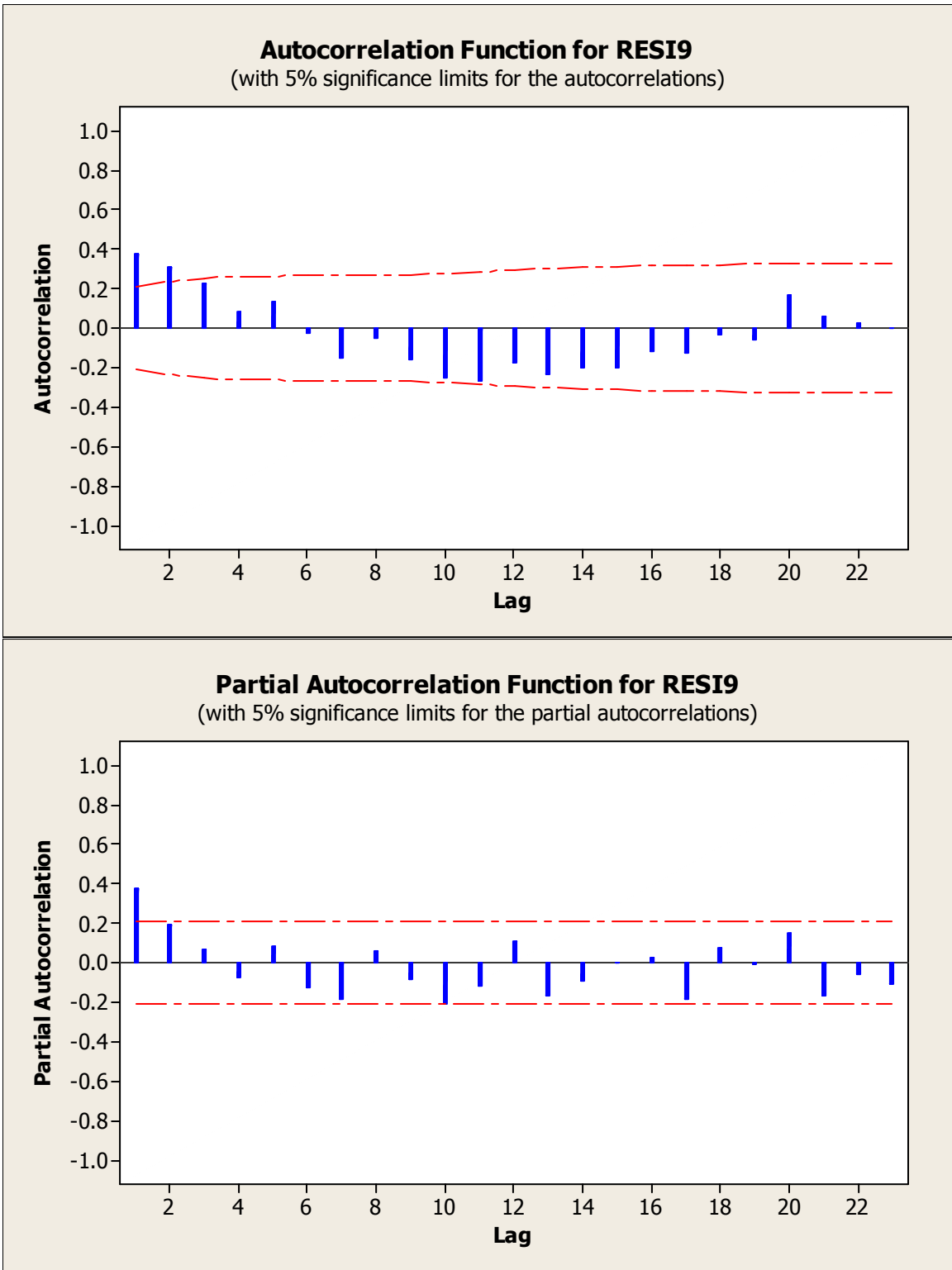


Figure 6. ACF and PACF plots of regression residuals.

The data was next fitted to an ARIMA model of the form (1,0,0). Again, the ACF of the (1,0,0) ARIMA residuals were examined to determine whether the autocorrelation problem was resolved. According to Figure 7, the autocorrelation issues were successfully addressed.

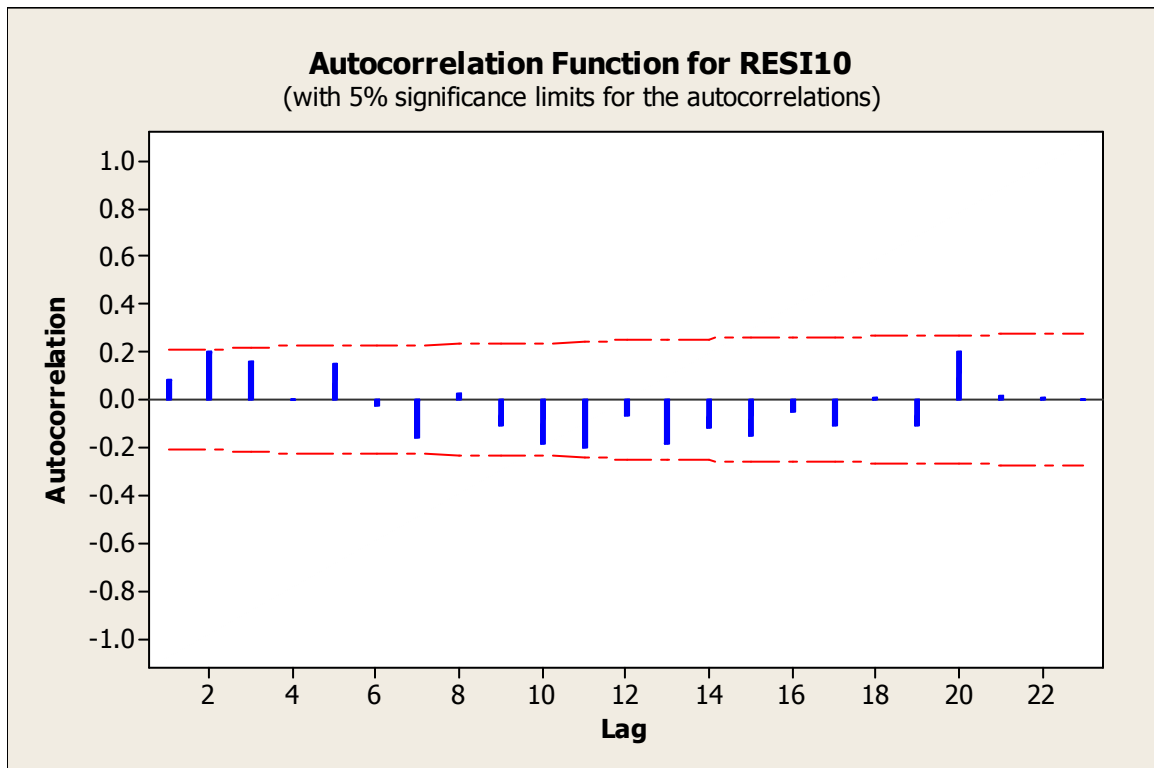


Figure 7. ACF residual plots of ARIMA Model (1,0,0).

Finally, the regression equation is modified to reflect the Box Jenkins.

$$\text{Table games drop} = -1.22\text{E}+11 + 3399425 \text{ Visitors(IV)} + 3.10\text{E}+10 \text{ DAug} + 2.79\text{E} + 09 t - 8.42 \text{ VV2} + e_t$$

Where  $e_t = \alpha t + 0.25\alpha_{t-1}$ ,  $\alpha_{t-1} \sim N(0, \sigma^2)$

Figure 8 shows an output of the ARIMA

**ARIMA Model: RESI9**

Estimates at each iteration

Iteration	SSE	Parameters
0	*	0.100
1	*	0.250

Unable to reduce sum of squares any further

Final Estimates of Parameters

Type	Coef	SE Coef	T	P
AR 1	0.2500	0.0984	2.54	0.013

Number of observations: 91

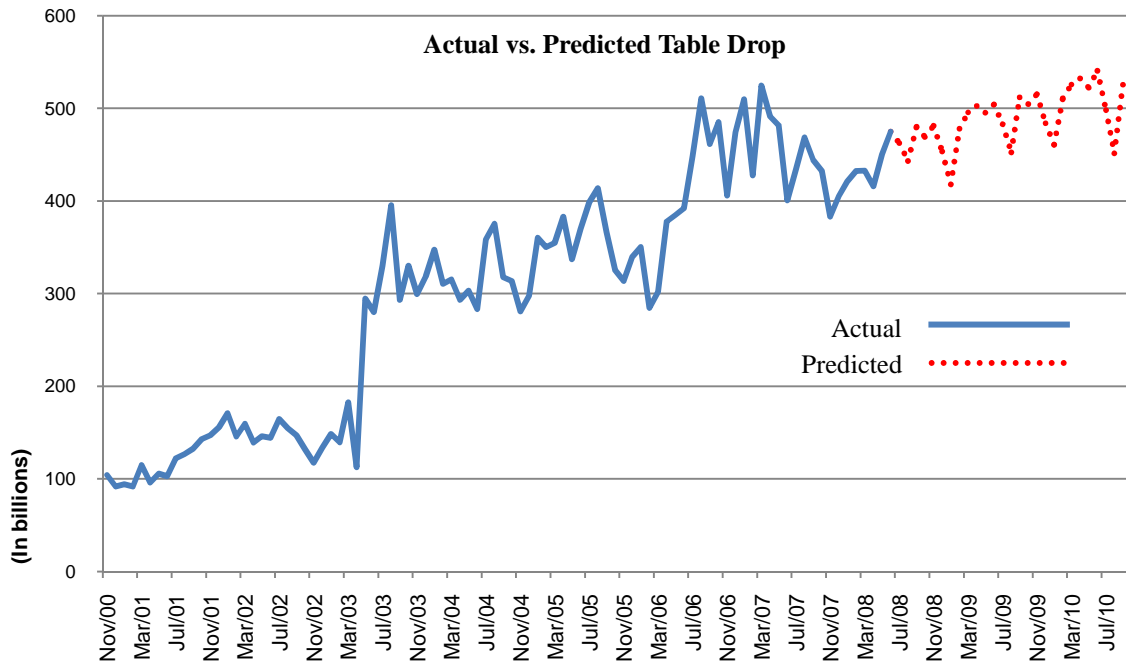
Residuals: SS = \* (backforecasts excluded)  
MS = \* DF = 90

*Figure 8.* Final output of ARIMA (1,1,0).

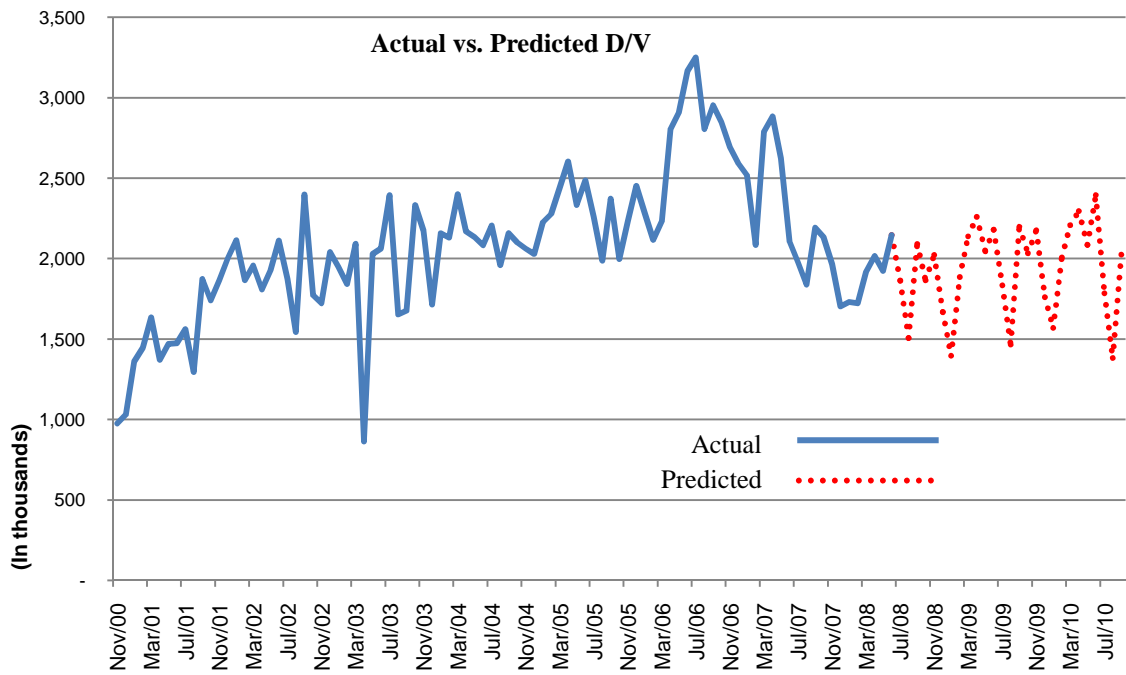
**Predicting table games drop**

Using data from November 2000 through May 2008, the ARIMA regression model was used to predict table games drop from June 2008 to September 2010. The regression equation with an R squared of 91.3% was a good fit to this subset of the data.

Figure 9 shows the forecasted table games drop in the months following June 2008.



*Figure 9.* Table games drop predicted versus actual values.  
 Note: Actual table games drop included from November 2000 to May 2008. Predicted table games drop included from June 2008 to September 2010.



*Figure 10.* Table drop divided by visitors predicted versus actual values.

## **Discussion of Results**

The result of this time series regression model indicate that the table games drop divided by the number of visitors, visitor's spending, decrease from June 2006, and stabilized in the following months. The number of visitors, August, trend were significant components in the final model. There were no significant positive seasonal components except for August in the final regression model. In Korea, most of the employees take a summer vacation during August. Also, summer break for school starts in the end of July. These may explain why August influences positively on gaming demand. The visitor's spending peaked at June 2006, shortly after the government banned illegal video game from the market. However, labeling of visitor's spending followed as the magnitude of increased visitor volume is larger than those of the increased table drop. Downward trend of visitor's spending indicated in this model implies that sales growth would slow in the future.

## CHPATER 5

### DISCUSSION AND IMPLICATIONS

#### Implications

##### Life cycle model in relation to the study

The findings of this study are consistent with Moss, Ryan, and Wagoner (2003), which testing Butler's Resort Product Life Cycle. In their study, Moss et al. found that Mississippi casino market followed the 7 stages of Butler's S-shaped product life cycle: 1. Exploration, 2. Involvement, 3. Development, 4. Consolidation, 5. Stagnation, 6. Decline, and 7. Rebirth. The study resulted that the industry was near the end of the mature stage (Stagnation) and headed to the Decline stage. Similar to their study, the data from this study indicated that Kangwon Land is possibly at the Stagnation stage, showing it already reached the mature stage (Figure 11).

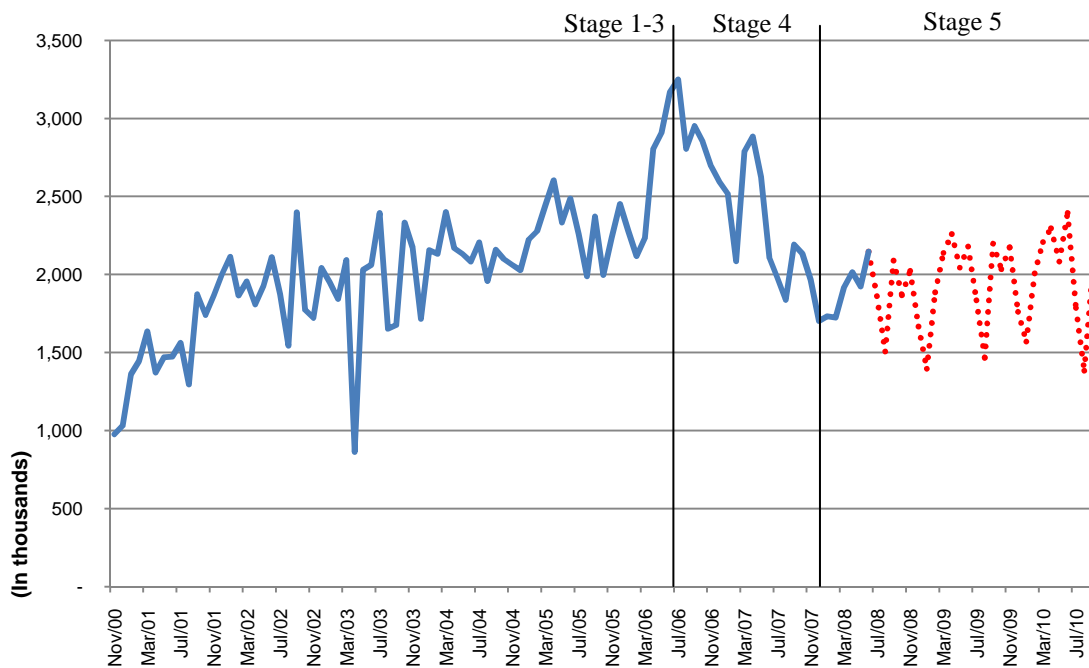


Figure 11. Actual and forecasted monthly visitor's spending.

Moss et al. suggested that the further revenue growth was not sustainable without adding more attractions such as concerts and golf courses to attract and keep customers (Moss, Ryan, and Wagoner, 2003). The overall gaming demand of Kangwon Land will continue to slowly grow at a diminishing rate due to the decreased customer's spending if Kangwon failed to gain ability to maintain sustained growth.

### **Managerial implications**

The results of the study are meaningful in that it predicted the decrease in customer spending on gambling at Kangwon Land casino. As there is no outside competition existing so far, the leveling of casino customer's spending could have a negative impact on further revenue growth. Findings of this study also indicate possibilities of the demographic shifts and changes in what customer wants. Further study of decreased customer spending will give insight on assessing where performance can improve and what factors drive performance. Kangwon Land needs to target its analytical efforts on how it performs its operations to a make better business decision in times when monopoly ends. Although the expiration of monopoly status does not necessarily mean the imminent introduction of a new domestic competitor, findings of this study suggest no further success is guaranteed as the resources such as participation and gambling equipment supply are constrained. Managers at Kangwon Land should consider the findings of this study when debating regulatory issues such as increasing gaming taxes or allowing new forms of gaming with government. Meanwhile, Kangwon Land needs to be more strategic to optimize key business process, and to identify the lost revenue opportunity. It is fundamental for Kangwon Land to create opportunities for differentiation to secure further business sustainability.

## **Limitation of the Study**

### **Secondary Data**

The findings of this thesis must be considered with regard to the inherent limitations. The first limitation of this study related to the use of secondary data. Zikmund (2003) said a secondary source fit the purpose of study very well in exploratory research. It saved budget and time in gathering data comparing to primary data (Zikmund, 2003). The secondary data is commonly used in the field of gaming revenue forecasting research. However, if secondary data is outdated, it may not exactly meet the purpose of the study. This study employed the 91-month period from October 2000 through May 2008. The more recent data for the major variable in the presented model, table games drop, for 2009 and 2010 could not be obtained. Thus, better forecasting was not available as a result.

### **Reliability**

The other limitation is associated with reliability of the data. Reliability is concerned with the consistency of the measurement that should be free from errors (Zikmund, 2003). Secondary data in this study were collected from Kangwon Land. It is believed that Kangwon Land gathered data daily in accordance with the company's internal policies on data collection processes or computerized casino data tracking system. However, there can be a possibility for unexpected human errors in collecting and encoding data.

### **Validity**

Validity refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher intends to measure (Zikmund, 2003). Specifically,



face or content validity refers to the professional agreement that a scale appears to accurately measure what it is intended to measure (Zikmund, 2003). This study utilized table games drop as the indicator of gaming demand. Apparently, table games win does not constitute the entire revenue of Kangwon Land. To strengthen the findings of this study, containing of slot machine coin-in to the total gaming demand will be required in further study. Another validity issue related to the use of table games drop is that some factors can distort the drop calculation. Kilby and Lucas (2004) pointed out the foreign chip, false drop, and cash wagering policy as examples of such factors. In Kangwon Land case, false drop is especially concerned as most of the players are repeated customers who usually buy a large amount of chips but wager a small fraction over and over. It could distort table games drop by creating an artificially high volume measurement.

### **Software**

The last concern of this study related to the use of Minitab. Although the daily data for this study were obtained, it had to be aggregated to monthly as the software had limitation. The use of daily data would greatly increase the overall accuracy of the model.

### **Recommendations for Future Study**

The most important recommendation for further study is to use the extended data from June 2008 to September 2010. It will help to apply the impact of recent changes in economy and the Korean domestic tourism industry to the presented forecasting model. Another recommendation is to conduct the study with slot machine coin-in along with the table games drop. To fully understand the growth maturity of gaming revenue, an analysis of total gaming demand is necessary. It is also recommendable to develop two separate forecast models: one with the slot coin-in versus visitor volume and the other with table

games drop versus visitor volume. The comparison between the two gives the clear idea on which game type visitors spent less. It will help the managerial decision on game mix to secure the gaming revenue. Furthermore, it will be meaningful to investigate the decrease/increase of visitor spending by different game types. Given the increased competition from Macau and Singapore, VIP customers might spend less than they used to on table games. As a new ski resort drives up the total number of customers, a new demand might enjoy slot machine better than table game.

### **Conclusions**

This study examined the future revenue growth potential of Kangwon Land casino, using table games drop as an indicator of gaming demand. A time series regression model utilizing dummy variables was developed to explain the past and predict the future behavior of table games drop collected from Kangwon Land representing the time period of November 2000 to May 2008. This study also utilized the number of visitors for the 119 monthly periods, from November 2000 to September 2010, to further investigate the impact on gaming demand in terms of visitor's spending. The findings of this study indicated that the visitor's spending peaked at June 2006, and decreased in the following month. As a result, the further growth potential of Kangwon Land casino will not be sustainable without strategic emphasis on marketing, structural changes and product innovations. In preparation for the possible advent of competitors, Kangwon Land needs to differentiate its resort offerings to gain competitive advantage for sustainable growth in a rapidly changing environment.

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