The economic and social impact of the gaming industry during economic downturns

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The economic and social impact of the gaming industry during economic downturns

by

Byron Marlowe

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Hospitality Management

Program of Study Committee:
Tianshu Zheng, Major Professor
Thomas Schrier
Young-A Lee
Ching-Hui Su
Eunha Jeong

The student author and the program of study committee are solely responsible for the content of this dissertation. The Graduate College will ensure this dissertation is globally accessible and will not permit alterations after a degree is conferred.

Iowa State University

Ames, Iowa

2017

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# TABLE OF CONTENTS

**LIST OF TABLES** ........................................................................................................ iv

**LIST OF FIGURES** ..................................................................................................... v

**ACKNOWLEDGEMENTS** ............................................................................................ vi

**ABSTRACT** .................................................................................................................. vii

**CHAPTER 1. INTRODUCTION** ...................................................................................... 1

  - The Gaming Industry .................................................................................................. 1
  - Economic Downturns .................................................................................................... 2
  - Purpose of the Study .................................................................................................... 4
    - Research Aim ............................................................................................................ 4
    - Research Objectives ................................................................................................ 4
    - Time Series ............................................................................................................... 7

**CHAPTER 2. LITERATURE REVIEW** .............................................................................. 9

  - Background .................................................................................................................. 9
  - History ........................................................................................................................ 11
  - Economic Impact ....................................................................................................... 12
  - Social Impact ............................................................................................................. 14
  - Employment Impact .................................................................................................. 17
  - Current Trends/Challenges ....................................................................................... 19
  - Capacity Management .............................................................................................. 20
    - Practical Implications of Overcapacity and Undercapacity .................................... 24
    - Causation and Consequences of Capacity Issues .................................................. 26
  - Revenue Management ............................................................................................... 31
    - Conditions for Effective Revenue Management .................................................... 32
    - Summary of Literature ......................................................................................... 34

**CHAPTER 3.METHODOLOGY** ..................................................................................... 37

  - Introduction ................................................................................................................ 37
  - Time Series Analysis ................................................................................................. 38
  - ARIMA with Intervention Analysis ........................................................................... 41
    - Box-Jenkins Method .............................................................................................. 43
    - Regression Method ............................................................................................... 43
  - Urban and Rural Gaming ......................................................................................... 44
Indiana Gaming Industry ................................................................. 45
Data Collection ........................................................................... 48

CHAPTER 4. A TIME SERIES WITH ARIMA ANALYSIS OF URBAN AND RURAL GAMING VOLUME AND CASINO EMPLOYMENT THROUGH THE RECESSION USING REGRESSION ANALYSIS .......................................................... 52

Data and Methods ........................................................................ 52
  Time Series with Intervention Analysis ..................................... 52
  Social Impact Regression Analysis ......................................... 53
Data Analysis and Results ............................................................ 53
  Impact Analysis ...................................................................... 53
  Recovery Analysis .................................................................... 59
  Social Impact Regression Analysis ......................................... 63
Discussion ..................................................................................... 66
  Gaming Volume in a Non-Destination Gaming State ............... 72
  Casino Employment in a Non-Destination Gaming State ......... 73
  Implications ............................................................................. 74

CHAPTER 5. SUMMARY AND CONCLUSIONS .............................. 80

Summary ....................................................................................... 80
Conclusions .................................................................................. 84

REFERENCES .............................................................................. 89
LIST OF TABLES

Table 1. Impact Analysis - Summary of Estimates of Model Parameters ..................57
Table 2. Impact Analysis - Summary of Autocorrelation Check Results .....................58
Table 3. Summary of Impact Identification ..................................................................59
Table 4. Recovery Analysis - Summary of Estimates of Model Parameters ...............62
Table 5. Recovery Analysis - Summary of Autocorrelation Check Results .................63
Table 6. Summary of Dummy Variables ......................................................................64
Table 7. Summary of Different Models .......................................................................65
Table 8. Summary of Regression Analysis Results .....................................................67
LIST OF FIGURES

Figure 1. Impact Analysis - Time Series Plot Results ...............................................................55

Figure 2. Trend and Correlation Analysis for First Order Differenced Time Series ..........56

Figure 3. Recovery Analysis - Time Series Plot Results.............................................................60

Figure 4. Trend and Correlation Analysis for First Order Differenced Time Series ............61
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ABSTRACT

Investigation is conducted into how gaming volumes and casino employment were impacted within a non-destination gaming state in urban and rural counties by the 2007-2009 economic downturn in The United States of America. Examples of urban and rural areas are researched in order to determine if certain gaming locations within a non-destination gaming state can be determined as recession proof. Effort is directed to establish and measure the gaming volumes before, during, and after the recession and also in addition to the analysis of employment figures issues such as the impact of gambling on the social environment is also factored into the overall analysis and findings. Findings indicate that while there was a slight drop in gaming revenue and employment figures during this period, non-destination gaming locations such as Indiana proved relatively resilient to the recession but were more vulnerable to external factors such as emerging competition from neighboring states. Evidence suggests that the gaming industry located in urban areas was more likely to impact the urban employment environment during the 2007 to 2009 recession than was evident in the rural areas in which the gaming industry is located.
CHAPTER 1: INTRODUCTION

1.1 The Gaming Industry

Though the commercial casino industry has experienced rapid growth during the last two decades, revenue challenges continue (American Gaming Association, 2014). Zheng, Farrish, Lee, and Yu (2013) shared that the gaming industry weathered multiple recessions and economic downturns during this period and was considered a recession-proof industry. Along with recessions and economic downturns, an increase in competition in this industry sector were major problems threatening the development of casinos in the United States. These problems were in part explained by an ongoing increase in the number of new casinos with greater capacity, and the decline of revenues in the overall US casino market in 2014 (American Gaming Association, 2014). Likewise, such challenges serve to pressure existing casino operators to focus on cost reduction efforts and diversify revenues away from the casino industry into other more profitable forms of entertainment (American Gaming Association, 2015).

For years the casino and gaming industries were considered resistant to economic downturns. Indeed, the economic downturn of 2007-2009 skewed that attitude due to the fact that the casino industry in the United States was immensely affected and saw a significant drop in business (American Gaming Association, 1999–2016). Most existing gaming-related research has focused on large gaming destinations like Nevada and New Jersey. Until the recent work of Zheng et al. (2013), no research had been conducted on non-destination gaming locales’ performance during the recession. Their results shared that non-destination
gaming locales’ gaming performance by volume showed resistance to the economic downturn. However, it only shared results from one non-destination gaming state. Therefore, I will validate Zheng et al.’s (2013) empirical evidence on the recession's impact on a non-destination gaming market. Also, I will investigate both urban and rural areas and counties gaming volume and casino employment within a non-destination gaming state, which will further investigate if certain counties within a non-destination gaming state are resistant to economic downturns based on population proximity to a casino. For this study, a regression analysis will be used to analyze the economic event of the 2007–2009 economic recession and its effect on urban and rural casino employment in the non-destination gaming state of Indiana.

Gambling is an economic activity, and the isolation of social impacts from comprehensive economic influences can be problematic (Coulter et al., 2013). Making, gambling research interdisciplinary (Walker et al., 2007). Scholars are expected to measure social impacts in an interdisciplinary fashion rather than to utilize scientifically constructed social impact studies (Oh, 1999).

1.2 Economic Downturn

Due to the United States’ economic downturn in the late 1970s and the success found in the emergence of legalized gambling in Las Vegas, Nevada, Atlantic City, New Jersey, became the United States’ second city to allow commercial gaming operations. Regarding the legalization of commercial gambling, citizens of Atlantic City reasoned that legal casinos might be the answer to the problematic economic issues found in both their local and state economies (Zheng et al., 2013). It was perceived that, in part, legalization of commercial
gambling in Atlantic City could potentially facilitate the development of mass-market
tourism in previously disadvantaged areas like Atlantic City (Zheng et al., 2013). Atlantic
City legalized casino gaming in 1976 and opened the first casino in 1978 (Zheng et al.,
2013).

In 2014, the overall casino market had generated $37.5 billion in revenue in the United States (American Gaming Association, 2015). The obstacles which have been shared are seen
in notable gambling destinations like the Las Vegas Strip, where consistently great and
increasing levels of positive forecasting as it relates to the future growth of casino gaming
had led to a period of unprecedented expansion in mega-casino capital projects over the past
two decades (Buil, Chernatony, & Martínez, 2013; Eadington, 2011). However, external
challenges such as the adverse economic impact facilitated by the recent recession in 2007–
2009 have resulted in the decrease of gaming revenues within the large casino hotels found in
the Las Vegas Strip; statistics suggest around a 14% decrease from 2007 to 2010 (Buil et al.,
2013; Eadington, 2011).

The combination of more recent economic volatility and the drop in gaming revenues
have triggered industry stakeholder concerns about the sustainability of expansion within the
gaming industry (Li et al., 2010). Should this aforementioned scenario continue, it could
potentially not only significantly reduce customer spending on casino games but also threaten
the development of local tourism-based economies and even the welfare of host economies
(Li et al., 2010).
1.3 Purpose of the Study

1.3.1 Research aim

The research aim was to establish how gaming volumes and casino employment were impacted within a non-destination gaming state in both urban and rural counties by the 2007–2009 economic downturn. The research problem concerned how the economic downturn of 2007–2009 affected a non-destination gaming industry; analysis was conducted to measure gaming volumes before, during, and after that recession. Additionally, the social impact of casino employment on urban and rural counties within a non-destination gaming state was measured.

1.3.2 Research objectives

1.3.2.1 To establish if the 2007–2009 recession affected gaming volume in a non-destination gaming state during the economic downturn.

1.3.2.2 To measure casino employment during the 2007–2009 recession in a non-destination gaming state.

The central proposition in this research tests the economic and social impact of the casino industry on local communities in both urban and rural areas during economic downturns in a non-destination gaming state. Essentially, this research seeks to evaluate and optimize a casino’s economic and social impact on local communities through the analysis of gaming volumes prior to, during, and subsequent to the 2007–2009 economic downturn. These volumes are tested via the measurements of gaming volume and casino employment. Furthermore, effort is directed to establish the economic and social impact of casinos on
urban and rural counties. Through the measurement of gaming volumes and casino employment before, during and after the 2007-2009 recession via scientifically based analysis, a greater understanding can be gained concerning what solutions can be provided to solve the research problem.

Additionally, the findings can provide residents living next to or in close proximity to a casino with a better understanding of how, specifically, the casino may affect their community from a socioeconomic perspective during an economic downturn. Should the public possess a holistic comprehension of the economic and social impact of casinos, through gaming volume and casino employment, the gambling industry could be viewed more objectively, thus allowing adoption of a more proactive and informed stance that would allow implementation of positive environmental changes for all stakeholders.

Regarding casino employment, the possible social impact of casino gaming involves an examination of casino employment variations in a casino employment before, during, and after an economic downturn. The degree to which casinos and their employees contribute to state and local governments also reveals increases or decreases in tax revenues and their contributions to social benefit programs in areas where gaming is licensed in the state of Indiana.

Time series is an effective forecasting tool that provides accurate forecasts based on recognized patterns in historical data (Bowerman, Connell, & Koehler, 2005). This more scientific approach to measuring trends and patterns can allow an ordered sequence of data points to be measured at successive points in equally spaced time intervals (Bowerman et al., 2005). Time series is observed and analyzed in a variety of fields for various purposes.
In terms of casino gaming and non-destination gaming performance during economic downturns, this dissertation study examines how the 2007–2009 recession affected the state of Indiana’s gaming industry by analyzing gaming volumes and casino employment prior to and during the recession. It is important to conduct an accurate evaluation of casino gaming during the recessionary economic cycle as the implementation of certain evaluation techniques can influence the ability of modeling to forecast future performance of casinos in economic downturns accurately. Therefore, this study will analyze gaming volumes prior, during, and after the recession of 2007–2009 using a time series with intervention analysis.

A hypothesis of this study is that non-destination gaming markets such as Indiana represent a more stable source of income during economic downturns for non-destination gaming states compared to the revenue derived from destination gaming states. Indiana, a non-destination gaming state according to the American Gaming Association, has thirteen commercial casinos that contributed $4.1 billion in economic activity to the state in 2013 (American Gaming Association, 2014). The quantitative research methodology serves to allow the researcher to utilize the time series model as a method to conduct analysis to confirm or deny this hypothesis.

A time series has one variable that is measured and recorded at successive points in equally spaced time intervals. Using an autoregressive integrated moving average (ARIMA) with intervention analysis, this study will investigate Indiana’s urban and rural counties gaming volume to determine if they were significantly affected by the recent 2007–2009 economic downturn. The rationale for using ARIMA with intervention analysis is that it is the only statistical procedure that tests and measures the impact of an exogenous event, like an economic downturn, on time series. The focus on statewide and county gaming volume
allows this study to examine the performance of Indiana’s gaming industry and more specifically its urban and rural counties through the recession from the demand side.

Zheng’s (2013) Iowa study using ARIMA served as the foundational methodology for the current study based in Indiana. This dissertation claims that there is a gap in the research as this type of analytical study has not been conducted in Indiana previously: the investigation of a statistically based model into casino employment using a linear regression analysis with secondary data from the Indiana Gaming Commission website is also explored in both urban and rural areas and counties in Indiana.

1.3.3 Time series

Time series differs from other types of data sets in that it possesses one variable that is measured and recorded at successive points in equally spaced time intervals (Zheng, 2014). This data set time series analysis can be utilized within the hospitality and casino gaming industries to measure average weekly revenue per available room, average daily occupancy rate, daily casino slot coin-in, weekly casino table drop, daily visitor numbers, and other elements of casino functionality (Zheng, 2014). In order to model and analyze a time series, it is critical to comprehend the unique characteristics of the data found in gaming volumes. Time series data has the capacity to examine and discover historical trends and patterns, which can be exploited to facilitate the preparation of a forecast (Zheng, 2014). While time series analysis ignores the casual relationship between an independent variable and the factors that affect it, it possesses the capacity to undertake challenging research analysis through the examination of only one variable (Zheng, 2014). Howrey (1980) indicates that time series analysis can be used for econometric research when little prior knowledge is
available to the researcher. Therefore, the time series analysis model is a unique methodological approach that provides more practical-oriented and flexible methods from which demand forecasting and capacity management (Howrey, 1980).
CHAPTER 2: LITERATURE REVIEW

2.1 Background

Research conducted in the twenty-first century suggests that the economic and social impact of casinos within communities in the United States has been the subject of much debate. However, this discussion has not been so evident in scholarly writing (Lee, Kim, & Kang, 2003). Therefore, the trends and challenges of both the economic and social impacts of the casino industry have been considered in practitioner or applied writing as well as academic or scholarly writing regarding this discussion. Lee et al., (2003) shared that the meaningful societal debate attributed to casinos’ economic and social impact has been influenced by attempts to find a balance between both the economic benefits and the social problems derived from gambling (Lee et al., 2003).

However, a challenge exists in that the casino economic and social impacts have not been well reported by academic research (Lee & Back, 2006). There are also practical considerations about this ongoing economic and social challenge as casino operators try to measure economic and social impact for national policy makers quantitatively; such attempts have been inconclusive (Lee & Back, 2006).

The collection of relevant data and the complexities found in conducting economic-oriented research on the impact of casinos on a local economy is evident in literature and remains an ongoing challenge for researchers. Specifically, the level of economic benefit of operating casinos has been reported with mixed results due to variance in previous studies’ time periods, cities, and regions creating inconsistencies in the literature findings. Moreover, what the casino industry has reported and defined as economic benefits varies nationwide.
Furthermore, this research problem is not just limited to the twenty-first century. Freudenburg (1986) argued that the existence of such academic challenges can be met by the development of “original data where ‘available’ data are not sufficient” (p. 451). As a solution to these challenges Freudenburg (1986) supported the research problem detailed in this dissertation by suggesting that further research should “incorporate scientific input” (p. 451) albeit such input will be tempered by “largely political decisions” (p. 451).

Hospitality, a human profession, is one of the largest and oldest industries worldwide and has been practiced since the beginning of civilization (Soanes & Stevenson, 2003). Hospitality is defined in the Oxford English Dictionary as “the act or practice of being hospitable; the reception and entertainment of guests, visitors or strangers with liberality or goodwill” (Soanes & Stevenson, 2003, p. 839). According to a model created by Ottenbacher, Harrington, and Parsa (2003), the supply of hospitality is divided into six distinct areas: lodging, foodservice, travel, leisure, attractions, and conventions. Research claims that tourism and travel perform the role of an “industry primer” (Biederman, Lai, & Laitamaki, 2008, p. 1) and supply eight different industries: namely, lodging; foodservice; conventions and meetings; airlines; cruise lines; railroads and other transportation mechanisms; amusement parks; and also gaming. The supply of hospitality products and services remains one of the largest global industries due to consumer demand; such demand is fueled by the ongoing rapid expansion of global tourism and travel (Biederman, Lai, & Laitamaki, 2008).
2.1.1 History

Legalization of commercial casino operations in the United States began in the 1930s (Zheng, Farrish, Lee, & Yu, 2013). Legalized casino gaming has grown rapidly since the latter half of the 1980s, but before then, the United States’ federal legislation only allowed this industry to operate in Las Vegas and Atlantic City (Garrett, 2004). Historically, the expansion of commercial casinos passed through two stages (Zheng et al., 2013). The first stage, designed to stimulate the Las Vegas economy in the 1930s, brought on by the Great Depression in 1929, leveraged legalized gambling as a strategic method of economic development. Commercialized casino gaming was designed to stimulate the host community’s economies (Zheng et al., 2013; Giacopassi, Nichols, & Stitt, 1999).

The second stage in the development of commercial casinos started in the late 1980s and continues today (Coulter, Hermans, & Parker, 2013; Richard, 2010). Other states have followed suit and began to legalize commercial casinos to stimulate their local economies during the economic recession of the 1980s (Giacopassi, Nichols, & Stitt, 1999), and the casino industry has since continued to grow rapidly (Brown, 2005). Garrett and Wagner (2003) maintain that, as tribal casinos began to become more popular, some state governments decided that the introduction of commercial casinos could alleviate their budgetary deficits if the growth of tribal casinos were inevitable (Garrett & Wagner, 2003). Therefore, the 1990s witnessed the unprecedented rapid development of the commercial casino industry in many states; including riverboat casinos, which were legalized in Louisiana, Illinois, Iowa, and Indiana (Walker & Jackson, 2007; Wiley & Walker, 2011).
2.1.2 Economic impact

Conflicting data found in casino industry literature highlight the challenges posed for researchers attempting to measure or evaluate the extent to which casinos economically impact host communities; such inconsistency in findings derived from collected data relates not only to the economic implications but also to other forms of societal impact (Grinols, 2004). From an economic perspective, labor markets, economic welfare, casino stock indexes, and state tax revenues have all been investigated to estimate both the positive and negative impacts of casinos on local economies (Grinols, 2004). However, complexities found in the collection of relevant economic data and difficulties experienced in the definition and validity about the appropriate search parameters have resulted in challenges in establishing the relationships between casinos and local host communities (Grinols, 2004).

The inability of existing research to conclusively determine the impact of casinos on society can also lead to ignoring positive economic factors that could be attributed to gambling (Cotti, 2008; Humphreys et al., 2013). Such positive benefits can be derived via casino stock markets (Tsai & Gu, 2006), real estate values (Phipps, 2004; Wiley & Walker, 2011), and state tax revenues (Walker & Jackson, 2007). However, due to the research challenges imposed by the complexities found in the collection and accurate scientific analysis of data and the difficulties in defining acceptable numbers of parameters, research on the monetary relationship between casinos and local economies has also yielded mixed results (Phipps, 2004; Wiley & Walker, 2011; Walker & Jackson, 2007).

Research conducted by Walker and Jackson (2007) also questions if a relationship exists between casino revenue and monetary benefit to local or regional economies. Their data, based on the period 1991–2005, found that there was no causal relationship between
real casino revenues and real per capita income at the state level (Walker & Jackson, 2007). This contradicted the findings from their earlier study (Walker & Jackson, 1998) in which data from 1991–1996 was collected. The previous study concluded that casinos have a short-term positive effect on a local community’s economic growth. Therefore, conflicting findings were offered by the same researchers, albeit regarding research conducted over different time periods (Walker & Jackson, 1998; Walker & Jackson, 2007). This conflicting evidence suggests that other analytical scientific methods should be employed to correctly ascertain and quantitatively measure financial relationships between gambling and local communities (Stitt et al., 2003).

Perdue, Long, and Kang (1999) found that local communities had both the capacity to adapt in the short term to the adverse aspects of gambling, such as higher crime rates, and the ability to leverage long-term advantages offered by the monetary benefits sourced from casinos. These advantages, in turn, served to provide a perceived enhanced quality of life in communities hosting casinos (Perdue et al., 1999). Their findings correlate in part to evidence offered by Walker and Jackson (1998); however, the results of Perdue et al. (1999) point to the longer term, whereas Walker and Jackson (1998) differ in that the benefits were seen only as short term.

However, due to the research challenges imposed by the complexities found in the collection and accurate scientific analysis of data and the difficulties in defining acceptable numbers of parameters, research on the monetary relationship between casinos and local economies has also yielded mixed results (Phipps, 2004; Wiley & Walker, 2011; Walker & Jackson, 2007).
2.1.3 Social impact

Walker and Barnett (1999) argue that a social cost requires that the action reduces the total wealth in society. However, many researchers have questioned that claim because it excludes the influences of wealth transfer and other similar financial transactions or activities that may cause or be attributed to social costs. In contrast, Grinols (2004) defines social costs that are derived from gambling as almost any negative impact that links to gambling. This impact includes crime; business and employment costs, such as “bankruptcy, suicide, illness” and time waste (Grinols, 2004, p. 145); direct regulatory costs, family costs, such as child neglect and abuse; and “abused dollars,” which are “lost gambling money acquired from family, employers, or friends under false pretenses” (p. 145).

Research conducted into the social, economic, and environmental impacts of casino gambling on the residents of Macau and Singapore inferred indirectly that gambling behaviors and gambling’s impact on society were similar in both the East and the West (Wu & Chen, 2014). Research conducted by Fong et al. (2011) and Wu and Chen (2014) is believed to be relevant to this study, subject to the following considerations. First, the effect of the economic downturn in the United States on the gambling industry does not necessarily correlate to any downturn experienced in the East. However, as noted above, social impact imposed by gambling possesses similar characteristics regardless of external economic conditions. Therefore, evidence pointing to such impact can serve to support evidence accessed by research conducted in Indiana.

Regarding financial impacts on society, Wu and Chen (2014) concluded that social attitudes and lifestyle could not be separated from the fiscal impact. Family related issues such as “family relationship, child-caring, living burden, rent pressure, and housing quality”
(p. 296) were more psychologically based impacts rather than directly attributable to financial costs, though all of these psychological considerations can be indirectly related to fiscal and monetary issues (Wu & Chen, 2015).

Psychological stressors can be introduced by the presence of gambling facilities should religious beliefs or other ideologies be added to the study analysis, as was evident in Macau and Singapore. Moreover, Wu and Chen (2014) suggested that religious beliefs place a more “far-reaching” (p. 297) impact on social infrastructure compared to the positive or negative monetary impacts imposed by casino operations. Research remains inconclusive. Gazel (1998) negates this concept claiming that “some states, churches, and other charitable institutions promoted gambling” (p. 67) as a means to collect revenue. Wu and Chen (2015) conceded in part by their support of earlier noted research findings that community attitudes change as the casino becomes established over time within the community. Their findings did not clarify if these changes in attitudes included perceptions formed by religious beliefs or by pro-gambling influences derived from religious institutions.

As noted earlier by Grinols (2004), social costs can also be measured regarding dollars (Thompson & Schwer, 2005). These costs can be viewed as the expenses derived from gamblers’ activities. Chhabra (2007) claimed that the costs in dollars to society caused by gamblers vary significantly according to different research findings. Therefore, research into quantifiable dollar gambling costs for the local communities remains inconclusive and should be quantified using more scientific analysis methods, as noted earlier (Chhabra, 2007).

These gambling costs regarding monetary value can be derived via domestic violence, divorce, bankruptcy, drug and alcohol abuse, and problem gambling (Wu & Chen, 2015; Chhabra, 2009; Harrill & Potts, 2003; Long, 1996). Research into the impact of casinos and
the parallel increase in criminal activities remains inconclusive. Reported by Wu & Chen (2015) as shared by Long (1996) who claimed that, whereas 50% of the communities studied indicated higher levels of demand for child protection, marriage counseling, and other social service programs due to gambling, other communities indicated otherwise. Long (1996) conceded that the other 50% of communities studied indicated less demand on public services.

Supportive of this lack of conclusive findings, Stitt, Nichols, and Giacopassi (2003) collected and analyzed data encompassing statistics about crime rates before and after the opening of a casino. Their study yielded few consistent findings across the test and control communities (Stitt et al., 2003). They found that crime rates increased significantly in some casino communities, some remained relatively stable, and others decreased (Stitt et al., 2003). These researchers concluded that the development of casino gambling has no direct associations with the increase of criminal activities; this conclusion imposes problems when allocating quantifying monetary values to the impact of casinos on communities (Stitt et al., 2003). Their conclusion runs contrary to many other previously noted findings, providing a valid rationale to conduct further research into the relationship between casinos and local communities during economic downturns (Stitt et al., 2003).

In terms of possible positive social impacts attributed to casinos, Lee and Back (2006) claimed that gambling locations could influence the protection of natural environments and ecological resources and the preservation of historical sites and cultural heritage. Moreover, their research discovered that development of local infrastructure was due to economic factors generated by casinos (Lee & Back, 2006). Local infrastructure benefits such as improved public transportation, upgrades in electrical facilities, higher medical standards,
revitalization of city landscapes, and increases in recreational playgrounds were due to the presence of casinos (Wan, 2012).

### 2.1.4 Employment impact

Garrett (2004) explored the effects of casinos on jobs in six Midwestern states and revealed that rural counties that adapted to casino gaming experienced increases in household casino employment. The ability to adapt correlates to the findings offered by Perdue et al. (1999). However, findings provided by Garrett (2004) explored further and found that there were differences in the ability to adapt to gambling between urban- and rural-based communities. Cotti (2008) utilized a comprehensive data set on employment and earnings and found that a casino has positive effects on local employment but has no measurable effect on average income after a county adopts it. Detailed analysis revealed that the positive effect of casinos on industries related to gambling was relatively small and had little impact on employment levels in neighboring counties (Cotti, 2008). Based on some of the noted research findings, benefits derived from casinos are in large part attributed to smaller, local communities rather than county or state population groups (Cotti, 2008). Moreover, Humphreys and Marchand (2013) concluded that the benefits from casinos were limited to casino-related local industries, and the effects were short term. Wenz (2007) suggests that the benefit to local communities varied according to the proximity of residents to the casino; residents located close to the casinos benefited less than those located in bordering areas.

However, despite the volume of noted evidence, the impact of casinos on local communities is in part inconclusive and, from a researcher’s perspective, remains confusing due to the diverse and conflicting evidence offered by existing research. Such evidence
suggests that a more scientifically constructed form of data collection and analysis is needed to allow a more consensually based outcome (Wan, 2012). Garrett (2004) looked at social benefits more regarding the economic benefits attributed to casino operations such as increased employment revenue. However, the study cautioned that “true economic development occurs only when there is increased value to society” (p. 12). This infers that, while individuals may benefit from employment opportunities, the overall social benefit to communities lies in the improvement to society as a whole unit, including improvements in income, infrastructure, and lifestyle, and less tangible qualities, such as relationships and environmental concerns.

Despite this focus on the community rather than the individual (societal versus private), Garrett (2004) maintains that the overall effect on the community can be seen in terms of not only jobs in the casino but also the indirect increase of employment due to the creation of support industries, including the “increased demand for non-casino goods and services” (p. 12). Moreover, casinos can attract external human resources and investment as direct and indirect supportive mechanisms, such as is evident in the construction of new housing and infrastructure projects to facilitate consumer and supply demand.

Also, Garrett (2004) claims that rural communities can benefit more from gambling than their urban counterparts. This is especially true when management in rural communities opts to adopt casino operations and allocate the status of gambling to that of a “major or predominant industry” (p. 21). This is not so likely in more economically developed urban areas, where gaming has a lesser overall impact due to the size and development of existing industries and economic infrastructure. However, regardless of economic density, Garrett
(2004) concedes that casino gaming is increasingly seen as a social and economic benefit in both of these environments.

Inevitably, higher employment, more industry, and higher county or state revenue coupled with increased disposable personal income can lead to increases in asset values, such as private and corporate property, and commodities, such as vehicles and household goods other than fast-moving consumable goods (FMCG). The primary trigger for increased wealth and prosperity is generated via the increase in disposable income, which in turn is derived from increased employment. Statistics relating to gaming volume, and casino jobs in Indiana where casino gaming is licensed help create the analytical framework for this dissertation.

2.1.5 Current trends/challenges

The earlier noted gap in existing research literature significantly challenges this dissertation to evaluate better and optimize analysis on casinos’ social and economic impacts on local communities. Identified is research that has attempted to fill the existing theoretical and methodological gaps. This study submits that there be a shortfall of evidence to support any disciplined theory or consistent methodology that addresses the impact of casinos on society.

The initial effect of casinos on employment in six Midwestern counties revealed that communities in both urban and rural counties temporarily experienced an increase in household employment (Humphreys & Marchand, 2013). However, this pattern was not sustained, because the positive economic impact was primarily limited to interconnected local hospitality and entertainment industries (Humphreys & Marchand, 2013).
Grinols (2004) claimed that casinos cannibalize other industries rather than encouraging outside investment. Despite the inconclusive findings of Humphreys and Marchand (2013), their research did indicate that employment can benefit from casino openings; however, such benefit was not sustainable in the long term. This infers that a gap in research exists concerning the ability to accurately create long-term predictions based on analysis of the economic and social impacts of casino employment in communities where casinos are located.

The justification for a study on both urban and rural counties can be rationalized by understanding that most research conducted into the impact of casinos on local communities is often facilitated to measure the impact of tourism, often classified into social, economic, and environmental impacts (Lee & Back, 2006). However, a gap in research may exist due to the lack of existing research studies into how casinos affect local employment and local communities (Lee & Back, 2006).

### 2.2 Capacity Management

The economic theory of supply and demand relates to the interaction between the supply of a resource and the demand for that same resource (Henderson, 1922). Supply and demand theory influences both revenue and capacity management in the hospitality industry. Vail Brown, of Smith Travel Research, claimed that “room demand, average daily rate, revenue per available room and room revenue are all at absolute all-time highs” (Mayock, 2015, p. 1). To better apply revenue management in the hospitality industry, practitioners must have a thorough understanding of underlying economic theory, such as supply and demand, opportunity cost, competition, and consolidation (Chiang, Chen, & Xu, 2006).
Edgar (2000) focused on the economic theory of supply and demand and underlined the concept of revenue management within the context of the hospitality and tourism industry. Regarding supply and demand, hospitality has distinct characteristics that set it apart from other economic activities (Stabler, Papatheodorou, & Sinclair, 2010). Distinct characteristics, such as “perishability,” set hospitality apart from other economic activities that utilize the same supply and demand theory (Stabler et al., 2010). For example, hotel rooms are perishable because they cannot be stored (Kotler, Bowen, & Makens, 2006). The challenge for the revenue manager is to balance supply and demand characteristics to maximize profits for the lodging operation (Upchurch, Seo, & Ellis, 2002).

Crandall and Markland (1996) research findings have suggested that there are two foundation strategies: namely, a “chase-demand” (p. 107) strategy and a “level-capacity” (p. 107) strategy. The chase-demand strategy is designed to ascertain the demand and then factor in the appropriate capacity required to meet such demand (Crandall & Markland, 1996). A level-capacity strategy is constructed to allow capacity management to maintain a constant, balanced capacity while also simultaneously ensuring that demand is controlled.

Crandall and Markland (1996) also indicated that the management of supply and demand is the responsibility of capacity management personnel, as they need to ensure that the “shifting balance” (p. 107) characteristic of service-orientated industries is appropriately monitored and managed. Their research also found that capacity management should be tasked to proactively implement preventative planning mechanisms rather than utilizing short-term reactionary measures (Crandall & Markland, 1996).

They also established that capacity management located within the services sector could possess some uniquely designed variables compared to those evident in the
manufacturing sector (Crandall & Markland, 1996). This includes the seasonality of hospitality products and the presence of the customer when the service is being offered (Adenso-Diaz & Gonzalez-Torre, 2002). This differentiation between the theories about hospitality capacity management from that of traditional manufacturing capacity management can potentially affect the service levels found within the hospitality industry (Adenso-Diaz & Gonzalez-Torre, 2002). This is because hospitality capacity managers are more tasked to focus on personalized demand as opposed to the manufacturing sector, which does not require such a customized approach (Adenso-Diaz & Gonzalez-Torre, 2002).

Also, regarding profitability, it is critical to match capacity to future needs or demands (Adenso-Diaz & Gonzalez-Torre, 2002). Overinvestment of financial capital resources can lead to waste and can compromise the ability to allocate financial capital efficiently; however, the opposite scenario holds true should a company possess scarce resources as revenue is lost and profitability is compromised (Adenso-Diaz & Gonzalez-Torre, 2002). Research assumes that the goal of a business is to maximize the owners’ wealth (Chadfield & Delbor, 2005).

Additionally, research maintains that it is critical to have the appropriate capacity to meet the specified demand levels because a company’s size determines not only a substantial portion of the fixed cost but also whether demand will be satisfied, or if the company will be idle (Heizer & Render, 2007). Regarding casinos and the hospitality industry, the development of capacity strategy is a critical operational function for all leisure-related enterprises (Pullman & Rodgers, 2010).

Similar to the manufacturing sector, capacity management is one of the most important factors that affect a hospitality company’s profitability potential (Pullman &
Rodgers, 2010). When all available resources are fully accessed and leveraged to implement value-added activities, the element of profitability is considerably enhanced within the hospitality sector (Pullman & Rodgers, 2010). However, resources are acquired at a cost, so, if paid resources are under-utilized, profitability and financial efficiency are compromised (Pullman & Rodgers, 2010). Therefore, all resources should be either directly or indirectly allocated into revenue generating mechanisms, failing which, the potential for maximizing profitability is attenuated (Pullman & Rodgers, 2010).

Failure by the hospitality industry to optimize all paid resources (debt-laden or unencumbered) can be exemplified by the scenarios of excess human resources or surplus labor or cost overheads allocated to underutilized accommodation or additional activities in the hospitality industry (Pullman & Rodgers, 2010). Therefore, to prevent ineffective capacity management, neither overcapacity nor under capacity is desirable (Pullman & Rodgers, 2010). If demand is overestimated and a company’s infrastructure is out of proportion to actual demand, a portion of its capacity can be idle, leading to the inefficient allocation of operating costs, and thereby directly affecting company performance levels (Zheng, 2014).

On the other hand, if demand is underestimated, under capacity occurs, and a company can compromise its true potential and become disadvantaged regarding lost opportunities (Zheng, 2014). Neither overcapacity nor under capacity is desirable within the capital intensive hospitality and lodging industries (Zheng, 2014). To maximize hospitality company revenues, it is critical for a hospitality company to establish an appropriate capacity based on projected future demands (Zheng, 2014).
2.2.1 Practical implications of overcapacity and undercapacity

The overdevelopment of lodging capacity can be inadvertently caused by concerns over the scenario of increased competition, especially if there is a rise in the number of new incoming lodging properties, which in turn can result in a drop in occupancy rates and losses in market share and profitability (Chon & Sing, 1993). Furthermore, Lee and Jang (2012) found that the overdevelopment of the US lodging industry was due in part to uncertainties in market demand. Their study pointed out that the consequences of underdevelopment tended to impose a higher level of adverse impact on stakeholders located within the hospitality industry than did the scenario of overdevelopment (Lee & Jang, 2012).

Regarding practical reality obtained from statistically based historical data, the July 2015 edition of the Smith Travel Research Pipeline Report stated research conducted on behalf of the travel sector found that 3,597 projects, totaling 430,917 rooms, were under contract in the United States. This trend represents an 11.0% increase in the number of rooms under contract compared with data found in the July 2014 edition, and a 19.0% year-over-year increase in rooms under construction (US Hotel Construction Pipeline, 2015).

More significantly, 129,000 rooms were already under construction in 2015—a 32% increase from construction recorded in 2014 (Smith Travel Research, 2015). Regarding projections and forecasts, in 2015 it was forecast that 94,000 rooms were scheduled to be completed and open, compared to the 63,000 hotel rooms that had opened in the previous year (Mayock, 2015). From these statistics, it is apparent that there is currently an even greater potential threat of overdevelopment in the US lodging industry compared to the threat from developments completed in the previous year (Mayock, 2015).
In support of research conducted by Lee and Jang (2012), Chen and Lin (2013) examined Taiwan’s lodging industry and subsequently confirmed that uncertainty of market demand within the hospitality sector was one of the leading causes of hotel overdevelopment. This uncertainty was further exploited by the scenario in which the time allocated to a hotel’s construction and its subsequent opening could result in expansion strategists failing to forecast the possibility of the hotel opening just before or during an economic downturn (Zheng, 2014). More significantly, Zheng (2014) claims that most existing capacity management literature focuses on interpreting the effects of overdevelopment, from different perspectives, after capacity oversupply has occurred.

Moreover, reaction to such an oversupply situation means that revenue managers are at a strategic disadvantage in terms of time constraints (Zheng, 2014). This is because they are more likely to play a more reactionary and defensive role rather than use a more proactive and preventative design that could meet accurate lodging capacity as market demands change (Zheng, 2014). This market phenomenon attributed to the lodging and hospitality industry was evident not only in Taiwan but also in recent US closures of casino hotel and gaming properties in Atlantic City (Zheng, 2014).

Although most US hospitality markets during this period had maintained a favorable outlook and had continued to allocate financial investment and other resources, certain areas closely associated with the hospitality and gambling industry were adversely affected (Zheng, 2014). Research indicated that hotel room closures and postponements or delays in the implementation of hotel development plans were considerable in Atlantic City (Zheng, 2014). Mayock (2015) supports this evidence by referencing additional findings indicating
that, in 2014, approximately 5,000 hotel rooms were closed in Atlantic City alone due to overdevelopment issues.

2.2.2 Causation and consequences of capacity issues

Overoptimism or inaccurate forecasting regarding capacity is one of the causes behind overdevelopment and overcapacity in casino destinations such as Atlantic City (Kotler et al., 2006). The rationale behind such causation included in the study conducted by Kotler et al. (2006) suggested that casino hotels are designed for the specific purpose of gambling, so when this industry is adversely affected by either internal or external forces, these hotels are vulnerable (Daly, 2002).

Furthermore, other research found that the gambling industry in Atlantic City was structured differently than in other locations such as Las Vegas (Eadington, 1999). According to that study, the state of New Jersey reacted differently than Nevada as the gambling industry expanded; it put in place a tough, stringent regulatory framework which demanded that casino hotels built and operated in Atlantic City had to be constructed to certain specifications and space zoning (Eadington, 1999). In part, this framework was designed to limit incoming investment and speculator participation to retain control within a relatively small number of operators (Eadington, 1999).

This resulted in planning casino operations located in Atlantic City in a way that allowed them to “develop as an oligopoly” (p. 175). Rather than incur unnecessary and unwanted federal and state oversight, a monopoly was avoided in favor of an oligopoly so that a plurality of ownership, albeit exclusive, retained a measure of control over the gambling industry in New Jersey (Eadington, 1999). With other destination gaming options
in the Northeast region of the United States, many customers have accessed casinos within closer proximity to their homes (Eadington, 1999). ‘Moody’s Investors Service’ believed that casino closures in Atlantic City would continue due to the growth of the industry in other parts of the United States, which would impose more competitive stressors on the casino industry in New Jersey (Moody, 2015).

This was validated by their claim that starting in 2014, eight new casinos valued at $5 billion would be opening in the Northeast region over a three-year period, which would impose further stress on gambling businesses in Atlantic City, where 4 of the 12 gambling halls went out of business in 2014. Such a scenario would add to the ever-increasing competition in the region (Ianieri, 2015). Moody’s (2015) report did not predict how many casinos were likely to close due to overcapacity, but it forecast that the number of lodging casinos in Atlantic City would continue to shrink.

Also, it seems that overcapacity is not just limited to the United States. Evidence suggests that the fast-growing demand of different markets related to the casino industry has led to a rapid expansion in Eastern countries within regions such as Macau, China (Wong & Palmeri, 2015). On May 27, 2016, the Galaxy Entertainment Group plans to open the first of three new hotel-casinos focused on entertainment, culture, and sport rather than gaming and gambling (Wong & Palmeri, 2015).

This diversification of market supply indicates that problematic issues such as the oversupply in Atlantic City will be partially avoided by hotel-casinos in the East (Wong & Palmeri, 2015). The allocation of resources into facilities other than gambling places puts less reliance on the cyclical swings of the gambling industry (Wong & Palmeri, 2015). In addition, Galaxy Entertainment Group’s findings suggest that the overall theme behind these
more recent developments was the establishment of a more family-orientated environment (Wong & Palmeri, 2015). For example, a casino complex designed to mirror New York’s Broadway theater district is being marketed as Macau’s newest family-friendly destination (Wong & Palmeri, 2015).

This concept, of additional family entertainment offerings, is supported by other casino projects such as those of Melco Crown Entertainment, which plans to finish their next Macau lodging casino project later in 2016, complete with Asia’s tallest Ferris wheel. The Sands China will follow with a property featuring a half-size replica of the Eiffel Tower (Wong and Palme
ri, 2015). Their research infers that diversification into more general tourist attractions will be coupled with casino projects, thereby providing multiple attractions for a wider range of consumers. Such diversification spreads the risk posed by funds allocated solely into casino investment (Wong & Palmeri, 2015).

The addition of hotel rooms and casino tables for a new demographic of family-focused leisure travelers coupled with the development of non-gaming activities can safeguard profitability and return on investment (Wong & Palmeri, 2015). Moreover, this hedge against declining gambling revenues is in part justified by more recent declines in gaming revenue; research claims that gambling revenue in Macau fell, for the first time since 2002, by 2.6% to $44 billion in 2014 (O’Keeffe, 2015). Chen and Lin (2013) argue that overcapacity can be attenuated by the implementation of yield management strategies which are designed to facilitate the reduction of high-frequency demand and market fluctuations by “selling rooms and services to the right people at the right time and the right price” (p. 462). This suggests that casino stakeholder decision makers should use marketing strategies that target specific consumers. Based on concepts offered by Wong and Palmeri (2015),
marketing should be directed at not only gamblers but also families seeking alternative forms of entertainment (Chen & Lin, 2013).

In terms of under capacity, according to Heizer and Render (2007), inefficient capacity management has an adverse impact on both micro and macro levels because it undermines the primary purpose of a corporation, which is to maximize owner equity and property values. Undercapacity, when balanced against overcapacity, may be viewed as less risky due to the lower amount of employed capital. However, losing market share and reducing the customer database can also lead to long-term financial implications (Heizer & Render, 2007). Therefore, the risk posed by under capacity should not be linked to financial considerations only; it should also be seen as risky from a marketer’s point of view due to the cost of rebuilding a customer database (Heizer & Render, 2007).

Another strategy employed by gambling investment management pertains to acquisitions (Marriott, 2015). Avoidance of under capacity can be structured so as to acquire capacity via the purchase of or investment in companies offering similar types of capacity (Marriott, 2105). This also allows the incoming investor or acquisition organization to add customers to their existing customer database (Marriott, 2015). Marriott International’s recent purchase of Starwood Corporation has added capacity to its lodging products worldwide, which combats the threat of under capacity at a global level. They claim that the combined Marriott/Starwood Corporation will have 1.1 million rooms in more than 5,500 hotels worldwide (Marriott, 2015). According to their website and other available resources, Marriott International has added to capacity by implementing an acquisition strategy, and it is strategically planning to scale-up worldwide in order to avoid an under capacity issue in its international lodging business (Marriott, 2015). Therefore, it is crucial to determine optimal
capacity to maximize the utilization of both financial and human resources and to enable a sustainable return on investment (Marriott, 2015).

Heizer and Render (2007) indicate that forecasting demand accurately is one of the most important considerations for capacity management within the lodging and casino industry. Unlike some other industries in which stock levels can be increased or reduced to meet demand, the construction of a casino is capital intensive, and after construction, the capacity is fixed and is costly to increase; therefore, hospitality capacity is seen as a probabilistic demand cycle (Gu, 2003; Heizer & Render, 2007).

Hospitality researchers looking at issues about capacity problems can potentially learn much from the research conducted by tourism economists, who have made significant developments regarding demand management by exploring new theoretical concepts (Song, Dwyer, Li, & Cao, 2012). As noted earlier, it was found that the tourism and travel industry fuels the casino and hospitality industry; thus, capacity demand can learn from measures the former takes to, for instance, prevent overbooking or under capacity on commercial fights (Li, Song, & Witt, 2005).

Li, Song, and Witt (2005) maintain that hospitality capacity management should develop more conceptual frameworks from research data found in the tourism and travel industry. This can create the ability for hospitality capacity management to collect data relating to such theory and can allow the translation of such theoretical frameworks to shape practical applications that in turn serve to attenuate capacity issues found in the gambling industry (Li, Song, & Witt, 2005). Specifically, there are opportunities for researchers of hospitality and tourism revenue management to develop domain-specific theories that can strengthen the scientific identity of the discipline (Guillet & Mohammed, 2015). Introducing
demand analysis models from tourism studies into hospitality revenue management research creates the potential for conceptual development within the revenue management literature, thereby allowing proven methods to emerge that have the ability to further optimize capacity regardless of external economic factors and politically motivated restrictions (Guillet and Mohammed, 2015).

### 2.3 Revenue Management

As noted earlier, in terms of practical operational functionality, the global hospitality industry is fueled in part by international tourism. According to the World Tourism Organization (WTO), in 2014 revenue receipts increased 58%, from $735 billion in 2006 to $1,159 billion in 2013. The number of total international tourist arrivals rose 29%, from 842 million in 2006 to 1,087 million in 2013, suggesting that the dollar value per tourist has also increased during this period (World Tourism Organization, 2014).

From a theoretical perspective, Kimes (1989) defined hospitality revenue management as “yield management” (p. 15) and stated that it allows “the process of allocating the right type of capacity to the right kind of customer at the right price so as to maximize revenue or yield” (p. 15). This definition is the most widely cited of hospitality revenue management theories to date (Guillet & Mohammed, 2015). Kimes’ (1989) definition has been modified only slightly to include “at the right time” (Kimes, 2000, p. 1). Kimes (1989) noted that revenue or yield management is both an appropriate and an effective mechanism for the hospitality businesses, and it should possess the capacity to “segment its market into different types of customers” (p. 14). This segmentation strategy allows management to direct marketing strategies into specific niches in order to maximize revenue
streams (Kimes, 1989). In terms of revenue versus demand, Kimes (1989) notes that the revenue management environment can include peaks and valleys that exist in the demand curve when advance selling occurs, when fixed capacity exists, when the inventory is perishable, and when the consumer market can be subdivided into demand segments as conditions require for effective revenue management. Kimes (1989) further claims that this environment constructs the foundation for other theoretical perspectives within hospitality revenue management. The research is further established that tastes and interests vary across consumer segments and, to some degree, within consumer segments (Kimes, 1989). However, findings offered by Kimes (1989) did not possess the ability to identify if and how the hospitality industry satisfied these conditions. Research has since added and continues to add to these conditions or characteristics, which are amenable to effective implementation of revenue management and are noted as follows (Jones & Hamilton, 1992).

2.3.1 Conditions for effective revenue management

Jones and Hamilton (1992) concluded that information should incorporate various conditions that, when collected and processed, have the capacity to enable effective hospitality revenue management. They maintained that these conditions are, namely, identification of the competition, relative advantages held by each competitor, and clarification of the relative strengths and weakness of the casino and hotel property market in the context of each marketplace. Their ideas expanded on the earlier theory offered by Kimes (1989). One advantage found in the theory as defined by Jones and Hamilton (1992) was the ability to collect and manipulate data for revenue management purposes.
The collection and manipulation of data allow hospitality revenue managers a competitive advantage over their competitors regarding the construction of pricing and promotion strategies (Jones & Hamilton, 1992). Moreover, this gives hospitality providers the ability to determine strengths and weaknesses as a data-driven exercise as opposed to a solely qualitative and more practical-oriented approach; therefore, hospitality companies that do not possess the capacity to facilitate the collection and manipulation of such a database are at a disadvantage (Jones & Hamilton, 1992). Revenue management should consider the cost associated with the collection of data, the purchase of an integrated property management system designed to track and manipulate data, and the education and training required to effectively operate a database management system.

Lieberman (1993) further supplemented the theory about effective hospitality revenue management offered by Kimes (1989) by adding two more conditions: namely, where the cost per sale is marginal, and the production cost per unit is high. Pullman and Rodgers (2010) expanded on this theory and noted that many hospitality enterprises have a marginal cost per sale yet continue to have a high per-unit production cost, thereby allowing the possibility of weak financial performance.

This is exemplified the Bellagio hotel, which in 1996 had an original construction cost of US$1.6 billion dollars, yet when it opened in 1998 it was the most expensive hotel ever built. Such relatively excessive capital investment can impose adverse stressors on revenues and profitability (Sylvester, 2013). Moreover, Lieberman (1993) suggests that the pricing of hospitality products should be based on demand cycles. The purchase of hospitality products based on predetermined predicted demand can lessen the risk of product perishability (Lieberman, 1993).
Hospitality revenue management personnel can implement a qualitative collaborative approach by leveraging peer experiences to establish valid parameters designed to determine different rate ranges and restrictions on demand (Jauncey, Mitchell, & Slamet, 1995). The utilization of a complete record of historical data patterns can allow revenue management to create a room forecast. An advantage offered by this mixed qualitative and quantitative methodological approach is that it permits the capacity of individual properties to be optimized via the combination of resources that are designed to inform and determine revenue management strategy. Also, Kimes (2003) retrospectively insisted that, although common perceptions often perceive revenue management as only able to utilize quantitative research techniques, such as forecasting, optimization, and overbooking, qualitative techniques and strategies are also needed to optimize available resources and capacity.

Moreover, in terms of a possible intervention and personal perspective, understanding the consumer and their needs in addition to the quantitative data is a more holistic approach to effective revenue management as the mixed methods approach allows theory to be interpreted into meaningful practice (Kimes, 2003).

2.3.2 Summary of literature

Guillet and Mohammed (2015) investigated revenue management literature from three databases containing data relevant to hospitality and tourism revenue management research: the investigated articles were published in hospitality and tourism journals over a 10-year period (2004–2013). This period was crucial to the research conducted by Guillet and Mohammed (2015)—it was specifically selected as an extension of the review offered by Kimes (2003), noted earlier. The rationale behind their research was to provide the most up-
to-date knowledge on hospitality and tourism revenue management research (Guillet & Mohammed, 2015).

Their study concluded that of the 163 accessed articles that targeted revenue management from 2004–2013, the highest percentage (63.9%) of this published research was categorized under the “hotel/lodging/accommodation/resort” classification (Guillet & Mohammed, 2015). It is noteworthy that only four revenue management articles (2.5%) were classified as relating to the casino management industry. Notwithstanding, in addition to hotels, both theoretical and practical aspects of revenue management are now widely applied to restaurants, spas, golf courses, casinos, and theme parks (Ivanov & Zhechev, 2012). However, there is a shortfall of data, or a research gap, about more recent peer-reviewed research relating to revenue management (Ivanov & Zhechev, 2012). Moreover, there is a shortfall of the investigation published in contemporary casino literature relating to revenue management (Ivanov & Zhechev, 2012). Despite this shortfall, research conducted by Talluri and Van Ryzin (2005), which addressed an investigation of customized room rates based on customer segmentation, is of note.

A practical application derived and translated from their findings relates to the development of hotel gaming benefit programs offered by casinos as a form of establishing player rewards or gaming incentives regarding overnight stays (Ivanov & Zhechev, 2012). Increasing the dollar value per player has become a more competitive aspect of the casino business, and therefore, the responsibility to maximize the client revenue potential can be allocated to revenue management, especially if it addresses such challenges by implementing customer segmentation strategies like those noted above (Ivanov & Zhechev, 2012).
As an aggressive response to customer segmentation theory, Harrah’s Total Rewards Player program was created (Chen et al., 2012). The research argued that gaming resort revenue management must take into account special events such as blackjack tournaments or concerts as well as other auxiliary forms of income that are not seen as traditional core products of gaming (Chen et al., 2012). More recently, the Cosmopolitan Resort Casino president, Bill McBeath, conducted an evaluation on behalf of revenue management to ascertain other potential opportunities for the resort outside of traditional gaming. He claimed, “I have put together a pretty aggressive program to enhance and differentiate our product offering” (Stutz, 2015, p. 1). Here, the words “differentiate” and “segment” can be considered synonyms, thereby leading to the assumption that this VIP was essentially invoking the theory relating to customer segmentation within the hospitality industry (Stutz, 2015).

According to Guillet and Mohammed (2015), identifiable gaps in the contemporary casino literature relating to revenue management include that of pricing, customers, technology, business analysis, business environment, and distribution channel management. Significantly, their research claims that there is a gap in literature about the element of pricing (Guillet & Mohammed, 2015). While there is research conducted into the relationship between pricing and revenue management, there is a clear lack of conclusive evidence concerning the importance of pricing versus the importance other above noted gaps in contemporary casino literature (Guillet & Mohammed, 2015).
CHAPTER 3: METHODOLOGY

3.1 Introduction

The selection of research methods serves to provide different ways to identify, collect, and process data and allow the research problem, aim, objectives, and questions to be addressed (Leedy & Ormrod, 2005). This dissertation was designed to be supported by secondary literature–based quantitative methodologies so that statistically based data could influence the direction of the study findings. The collecting of data was enabled by the identification of relevant peer-reviewed literature, and this data was then scientifically analyzed. Moreover, previous findings within the sourced literature were used to gain a more subjective insight into how casinos have socially and economically impacted local communities (Leedy & Ormrod, 2005). The quantitative methodology was designed to allow the researcher to employ an objective viewpoint to address concerns posed by the research problem (Leedy & Ormrod, 2005).

Regarding casino gaming, non-destination gaming performance, and forecasting practices for economic downturns, this dissertation examines how the 2007–2009 recession affected the state of Indiana’s gaming industry, through the analysis of gaming volumes before and during the recession. It is important to conduct an accurate evaluation of casino gaming during the recessionary economic cycle because the implementation of accurate evaluation techniques can influence the ability of modeling to accurately forecast future performance of casinos in economic downturns. Therefore, this study analyzes gaming volumes prior, during, and after the recession of 2007–2009 using a time series with intervention analysis throughout Indiana and more specifically in urban and rural areas and
counties where casino gaming is licensed. The second analysis compares casino employment before, during and after an economic downturn. According to Garrett (2004), an empirical model should be developed for each county to capture employment changes several years before an economic impact. These changes can then be used to forecast employment changes from the date of economic impact through the end of the sample period those counties (Garrett, 2004).

A hypothesis of this study is that non-destination gaming markets such as Indiana represent a more stable source of income during economic downturns for non-destination gaming states compared to the income derived in destination gaming states. Indiana, a non-destination gaming state according to the American Gaming Association, has thirteen commercial casinos, which contributed $4.1 billion in economic activity to the state in 2013 (America Gaming Association, 2014). The quantitative research methodology allows the researcher to utilize the time series model as a method to conduct analysis to confirm or deny the hypothesis.

**3.2 Time Series Analysis**

Time series is an analytical tool that facilitates the ordered sequence of data points measured at successive points in equally spaced time intervals. It possesses the unique capability to measure one variable, recording at successive points in equally spaced time intervals. Time series analysis directed at the hospitality and casino gaming business is structured to include a average weekly revenue per available room, an average daily occupancy rate, a daily casino slot coin-in, a weekly casino table drop, and the day-by-day number of visitors served. To model and analyze a time series, it is critical to comprehend the
unique characteristics of the data. Time series data is usually examined to (or “intending to”) the discovery of a historical pattern that can be exploited in the preparation of a forecast. To identify this pattern, time series is seen as incorporating four components, and unique to time series analysis. Box, Jenkins, and Reinsel (2008) and, Anderson, Sweeny, and Williams (2006) maintain that a time series has four components: trend, cycle, seasonal variations, and random fluctuations. Trend, cycle, seasonal variations and random fluctuations are the four-time series components, and a time series can utilize one or more of these elements at any level and in any combination. The best forecasting model for a time series is the one that models the unique patterns of the time series data. Therefore, series forecasting should always begin by testing multiple forecasting techniques to identify the most appropriate forecasting model for the data.

There are two categories of quantitative forecasting models: univariate forecasting models (time series models) and causal forecasting models (econometrics models). Unlike time series models, causal forecasting models require two or more variables (one dependent variable and one or more independent variables). The dependent variable is examined and forecasted, and the independent variables are related to this dependent variable. Following identification of the independent variables, a statistical model can be developed that describes the relationship between the dependent variable and independent variables. The model can be used to forecast the future values of the dependent variable. For example, an econometrics model can be developed based on monthly marketing expenses and monthly sales over a past 10-year period. The model can then be used to predict the changes in monthly sales based on the specified amount of monthly marketing expenses.
While time series analysis ignores the causal relationship between an independent variable and the factors that affect it, it possesses the capacity to facilitate many challenging studies through the examination of only one variable. As Howrey (1980) indicated, time series analysis can be used for econometric research when little prior knowledge is available. Therefore, the time series analysis is a unique approach that provides many more practical and flexible methods for conducting analysis of demand forecasting and capacity management related studies.

Many tourism economists utilize time series analysis for research purposes. Tourism economic studies conduct time series analysis in order to examine the impact of exogenous events, such as the terrorist attacks on September 11, 2001, and the outbreak of severe acute respiratory syndrome (SARS) in 2003. For example, Eisendrath, Bernhard, Lucas, and Murphy (2008) measured the impact of the September 11 terrorist attack on the Las Vegas Strip gaming volume; Lee, Oh, and Leary (2005) quantified the decrease in US air transport passenger demand after the September 11 terrorist attack; and Ming, Lim, and Kung (2011) analyzed the impact of SARS on Japanese tourism demand for Taiwan. Song et al. (2012) examined 84 post-1990 tourism demand modeling and forecasting studies and found 26 studies using time series analysis with ARIMA and seasonal ARIMA (SARIMA) modeling.

Despite previously noted evidence of times series analysis research, a very limited number of time series–related studies for the lodging and casino gaming industries over the past decade have been identified; however, recent studies conducted time series analysis to detect and assess the impact of the 2007-2009 recession. It is noteworthy, that Zheng et al. (2012) reviewed the impact of the 2007-2009 recession on US restaurant stocks. In addition, Zheng (2014) strategically conducted an analysis utilizing the ARIMA method with an
intervention analysis technique to identify the overdevelopment of the US lodging industry and measure its impact on weekly RevPAR through the recession. Zheng identified that after the 2007-2009 recession had begun, the weekly US room supply was 9,878 more than expected, and the weekly US RevPAR was $16.00 lower than anticipated. The study further identified that the overdevelopment of the hotel industry caused approximately a $10.00 decrease in weekly RevPAR, indicating that the actual impact of the 2007-2009 recession was only approximately $6.00.

### 3.3 ARIMA with Intervention Analysis

The autoregressive integrated moving average (ARIMA) model incorporating intervention analysis is the only statistical procedure that tests and measures the impact of an exogenous event on time series, such as an economic downturn. Seasonal ARIMA (SARIMA) with intervention analysis determines whether an external intervention has a statistically significant impact on a time series and if it can quantify the impact. An identified quantified impact, which is the amount that is either more or less than what is expected, represents the difference between the actual time series and what the time series would have been if there were no intervention. Specifically, a time series is split into two data sets at the intervention point and the SARIMA model is developed based on the time series before the intervention point can be applied to the original time series in order to examine and determine the impact. To analyze a time series with seasonality, a SARIMA model, SARIMA \((p, d, q)\) or \((P, D, Q)s\) can be used, where \(P\) represents the seasonal autoregressive \(P\) order, \(Q\) represents the seasonal moving-average \(Q\) order, \(D\) represents the order of
differencing for stationary transforming at seasonal levels, and s represents the number of
time periods within a seasonal cycle (e.g., 12 for monthly data and 4 for quarterly data).

Once an ARIMA or SARIMA model is developed, it can be used to assess the impact
of an exogenous intervention on the data by detecting the structural breaks of the data and
measuring the magnitude of changes in data pattern trends before and after the intervention
(McDowall, McCleary, Meidinger, & Hay, 1980; Bowerman et al., 2005; Box et al., 2008).
ARIMA and SARIMA modeling are the most popular techniques utilized in univariate time
series based papers. While performing time series forecasting, scientists and experts
commonly analyze and model the data prior to time $T$ and utilize the model to forecast future
data past time $T$.

One of the challenges posed in the performance of time series forecasting is that
actual observations are not available to confirm the exactness of the forecasts. It is not
practical or viable to wait until future observations are accessible in order to assess the
model; the forecast ability of a model is evaluated by the utilization of the information
available at the time of testing. Therefore, such practicality issues are addressed by ensuring
that a time series is partitioned into both a training set and a test set. The training set is
utilized for the analysis and modeling, and the test set is conducted to assess and adjust the
forecast ability of the model. When a model is produced, it is employed to forecast the data
values for the same time span that the test set covers. The forecasted or estimated data values
are compared with the actual observations in the test set to determine the forecast capability
of the model. The differences between the estimated data values and the actual observations
are called errors. The smaller the errors are, the better the model is, and the more exact the
future forecasts will be. It is not uncommon that numerous models are created and contrasted in order to locate the model that delivers the most precise forecasts.

### 3.3.1 Box-Jenkins method

The Box-Jenkins procedure is a statistically sophisticated time series extrapolating method that fits ARIMA models to historical data (Box, Jenkins, & Reinsel, 2008). The Box-Jenkins procedure is considered accurate in terms of model fitting because it models both lagged dependent variables and estimation error residuals. The Box-Jenkins procedure is a mathematically sophisticated time series analysis technique that fits ARIMA models to time series data by modeling autocorrelations, such as the correlations between data points and between forecasting errors (Box et al., 2008).

### 3.3.2 Regression method

Regression analysis is a statistical procedure that examines the relationship between variables. The variable being predicted is the dependent variable and the variable(s) used to predict the values of the dependent variable are independent variables(s). Regression analysis that examines the relationship between two variables is defined as a simple regression, and regression analysis that contains two or more independent variables is a multiple regression. Regression analysis can be used for causal forecasting and time series forecasting, and this section focuses on the latter. The simplest approach to facilitate regression analysis for time series forecasting is choosing a time period as the independent variable (IV) and the time series as the dependent variable (DV). It is critical to use deseasonalized data for regression analysis whenever seasonal variations are present in the time series. After seasonal effects are
removed, the time series data set shows a linear relationship with a continuing upward trend, which in turn ensures good regression model fit.

3.4 Urban and Rural Gaming

Research suggests that community perceptions pertaining to casino operations can vary according to legal jurisdiction (Janes & Collision, 2004). In many poorer and disadvantaged communities, which exist in both urban and rural areas alike, societal perceptions of gaming are largely positive because casinos are seen to bring a measure of economic stability to the region, as opposed to other forms of entertainment. Thus, casinos are considered a financial solution rather than an economic cost (Janes & Collision, 2004). This economic stability is perceived regarding not only employment income and local taxes but also improved infrastructures, such as schools, hospitals and medical facilities (Janes & Collision, 2004).

Overall, local casino operations within both urban and rural areas were largely seen as positive to “host economies” (Walker & Jackson, 2007, p. 593), as an essential part of the community infrastructure, and as a hedge against prevailing local and national economic conditions (Janes & Collision, 2004). This has been facilitated in part by the investment of casino revenues back into the local economies and community infrastructures (Akee et al., 2015). Notwithstanding, their research indicates that gaming revenues have, in some areas, dramatically uplifted both the physical and psychological outlook for key stakeholders found within communities (Akee et al., 2015).

Reference was made in chapter 1 regarding statistically developing trends that indicate casinos affect the social well-being of both communities and individuals (Reith,
2006). However, expanding on this theme, attention is directed into how the economic welfare of local host communities is impacted by gambling; such attention is focused on geographical areas located within a 50 miles radius of casino operations (Reith, 2006). Research has indicated that economic problems associated with gambling within a radius of 50 miles of a casino have doubled since 1995 (Reith, 2006). Evans and Topoleski (2002) studied the impact on communities within a 50-mile radius from the locations of Native American casinos and found that the personal bankruptcy rate had increased 7% within four a four-year period of the openings of these casinos.

### 3.5 Indiana Gaming Industry

Indiana introduced casino gaming in the late 1990s into the mid-2010s. Research indicates that the benefits to local communities have been significant regarding economics and employment in Indiana. The American Gaming Association (2015) analyzed statistical data, which showed that casinos located in Indiana added $4.1 billion regarding revenue to the state economy. Furthermore, the data indicated that nearly 25,000 jobs were attributed to the gambling industry, which in turn contributed over $1 billion in employee income. Moreover, the gambling industry generated substantial tax revenues in Indiana totaling $245,633,378.

Urban counties where casinos are located in Indiana include Lake, LaPorte, and Vanderburgh counties. Lake County is an urban county in northwest Indiana and home to four casinos: Ameristar Casino, in East Chicago, Indiana; Horseshoe Casino, in Hammond; and Majestic Star Casino I and Majestic Star Casino II, in Gary. In 2014, the Lake County population was 490,228, according to the US Census (2016) population estimate; it was
Indiana’s second-most populous county. In 2015, total casino employment and gaming volume in Lake County, Indiana according to the Indiana Gaming Commission (2016) was 4,547 casino employees and $7,103,586,939 in total gaming volume.

LaPorte County is an urban county also located in northwest Indiana. According to the US Census (2016), the population of LaPorte County was 111,467 and home to Blue Chip Casino, which is located in the county’s largest city, Michigan City. In 2015, total annual casino employment and gaming volume in LaPorte County, Indiana according to the Indiana Gaming Commission (2016) was 1,068 employees and $1,759,703,436.

Vanderburgh County is a county located in southwestern Indiana. As reported by the US Census (2016) the population of Vanderburgh County was 181,398. The largest city in Vanderburgh County is Evansville with 120,310 residents, and home to the Tropicana Evansville casino. In 2015, total annual casino employment and gaming volume in Vanderburgh County, Indiana according to the Indiana Gaming Commission (2016) was 848 casino employees and $1,115,457,930.

These three counties and six casinos will be considered urban counties and casinos in this study. In 2015, total annual casino employment and gaming volume in these urban areas according to the Indiana Gaming Commission (2016) accounted for 6,463 casino employees and $9,978,748,305 in total gaming volume.

Rural counties where casinos are located in Indiana include Dearborn, Harrison, Ohio, Orange, and Switzerland. Dearborn County, is a rural county in southeast Indiana. The Dearborn County population is estimated at 49,455 and it was considered a rural county (US Census, 2016). Hollywood Casino is located in Lawrenceburg, Indiana which has a population estimate of 5,031. In 2015, total annual casino employment and gaming volume
in Dearborn County, Indiana according to the Indiana Gaming Commission (2016) was 920 casino employees and $1,718,815,253.

Harrison County, is a rural county located in the far southern part of Indiana, along the Ohio River. The Harrison County population is estimated at 39,364 according to the US Census (2016). Horseshoe Casino Southern is located in Elizabeth, Indiana which has 161 residents. In 2015, total annual casino employment and gaming volume in Harrison County, Indiana according to the Indiana Gaming Commission (2016) was 1,412 casino employees and $2,133,965,118.

Ohio County, is a rural county located in southeastern Indiana on the Ohio River. According to the US Census (2016), the population was 6,128. Rising Sun, Indiana, in Ohio County has a population of 2,205 residents is home of the Rising Star Casino. In 2015, total annual casino employment and gaming volume in Ohio County, Indiana according to the Indiana Gaming Commission (2016) was 590 casino employees and $564,660,062.

Orange County, is a rural county in south central Indiana and is estimated to be the home of 19,773 residents (US Census, 2016). Orange County, Indiana is home to the French Lick Resort Casino, located in French Lick, Indiana, which is estimated to be home to 1,794 residents. In 2015, total annual casino employment and gaming volume in Orange County, Indiana according to the Indiana Gaming Commission (2016) was 1,605 casino employees and $842,840,702.

Switzerland County, is a rural county in southern Indiana. The Switzerland County population was estimated at 10,524, and it is considered a rural county (US Census, 2016). Belterra Casino, is located in Florence, Indiana, its population is estimated at 1,782 (US Census, 2016). In 2015, total annual casino employment and gaming volume in Switzerland
County, Indiana according to the Indiana Gaming Commission (2016) was 934 casino employees and $1,155,636,946.

These five counties and five casinos will be considered rural counties and casinos in this study. In 2015, total annual casino employment and gaming volume in these rural areas according to the Indiana Gaming Commission (2016) accounted for 5,461 casino employees and $6,415,918,081 in total gaming volume.

In 2015, total annual casino employment and gaming volume in the state of Indiana according to the Indiana Gaming Commission (2016) accounted for 10,008 casino employees and $13,519,505,020 in total gaming volume.

3.5 Data Collection

A time series has one variable that is measured and recorded at successive points in equally spaced time intervals. Using an ARIMA with intervention analysis, this study will investigate Indiana’s gaming volume and whether it was significantly affected by this recent 2007–2009 economic downturn. The rationale for using ARIMA with intervention analysis is that it is the only statistical procedure that tests and measures the impact of an exogenous event, like an economic downturn, on a time series. The focus on statewide gaming as well as urban and rural counties gaming volume allows this study to examine the performance of Indiana’s gaming industry through the recession, from the demand side as a whole and based on population proximity to the casino operations.

Secondary data was collected from the Indiana State Gaming Commission website. Monthly coin-in, table drop, and admission statistics from January 1999 through May 2016 were obtained from monthly reports that are publicly available on the site. As suggested by
Bowerman et al. (2005), this study followed a three-step ARIMA model fitting procedure: identification, estimation, and diagnostics. This study attempts to identify the possible significant impact the recession had on monthly coin-in, table drop, and admission within the Indiana gaming industry in both urban and rural counties as well as the possibility of recovery for each variable after the recession. This will be facilitated by six SARIMA tests with intervention analysis, coupled with identical procedures, which are performed on six monthly time series.

To develop ARIMA models with the capacity to identify the impact of the recession, monthly data was used: from January 1999 to the month that had the lowest value after the recession started in 2007. The ability to perform a time series intervention analysis is dependent on the timing of the occurrence of an event (Zheng et al., 2013). For the purpose of this study, “Impact” was defined as a significant decrease in gaming volume after the recession started, and “impact month” was defined as the month a significant reduction was identified. “Recovery” was defined as a significant increase in gaming volume after the recession ended, and “recovery month” was defined as the month the major increase was identified. The procedures for all six analyses were identical as suggested by Zheng et al. (2013).

This study employs the Box-Jenkins procedure because of its robust and unique characteristics in modeling time series data. Compared with other time series modeling approaches, the Box-Jenkins procedure provides a more accurate model fit by factoring in lagged dependent variables and estimation errors (Box et al., 2008).

Autocorrelation, otherwise known as lagged correlation or serial correlation, is the correlation of a variable with itself. It is the central idea of time series investigation. This
relationship makes time series predictable. Autocorrelation in time series is the correlation of a time series with its past and future values, and time series model fitting relies largely on the measures of this relationship. For example, today's casino slot coin-in, in an everyday casino slot coin-in time series, is connected to casino slot coin-in of the past couple of days and is additionally associated to casino slot coin-in in the next couple of days. Based on this conceptual relationship, future everyday casino slot coin-in can be anticipated by the analysis and modeling of a day-by-day casino slot coin-in time series.

Introduced in the late 1970s, this technique has gained great popularity for researchers conducting time series analysis. Most post-1990 tourism demand-related time series studies used the Box-Jenkins procedure (Song et al., 2009); and more importantly, some gaming-related studies have demonstrated its superior performance to other time series analysis techniques (Eisendrath et al., 2008). Regarding the purpose of this study, ARIMA with intervention analysis is employed to test if Indiana’s gaming communities were significantly affected by the recession and if the lag time was evident and if any impact was detected on gaming volume.

The second analysis of secondary data from the Indiana State Gaming Commission website on casino employment is constructed in all Indiana counties which casinos operate so that total household casino employment is compared before, during and after an economic downturn. Garrett (2004) determined that for each county; an empirical model must be developed to capture employment changes several years before an economic event (Garrett, 2004). The sample period for this study is targeted at the 2007 to 2009 recession.

Lack of research and inconclusive mixed results suggest that the research into the social and economic impacts derived from casino operations, regarding both positive and
negative frameworks, offers significant gaps in the literature. No study has been identified that provides empirical evidence for testing casinos’ economic and social impacts during the 2007–2009 recession in non-destination gaming communities utilizing the time series theory in both urban and rural areas that host casinos.
CHAPTER 4: A TIME SERIES WITH ARIMA ANALYSIS OF URBAN AND RURAL GAMING VOLUME AND CASINO EMPLOYMENT THROUGH THE RECESSION USING REGRESSION ANALYSIS

4.1 Data and Methods

4.1.1 Time Series with intervention analysis

Focusing on gaming volume, this study examined the performance of Indiana casino industry before, during, and after the recession. ARIMA with intervention analysis was employed to examine statewide aggregated monthly slot coin-in, table drop, and admission. Data was collected from Indiana Gaming Commission website. This study used monthly time series data due to the nature of this study and the availability of the data. Monthly coin-in, table drop, and admission from January 1999 through May 2016 were collected from monthly reports that are publicly available on the website of Indiana Gaming Commission. To model seasonal effects of time series data, this study generalized an ARIMA model to a seasonal autoregressive integrated moving average (SARIMA) model by including seasonal autocorrelations and seasonal moving average terms. A seasonal model can be denoted as SARIMA \( (p,d,q)(P,D,Q)_n \), where:

\[
p = \text{the number of autoregressive terms} \\
d = \text{the number of nonseasonal differences} \\
q = \text{the number of moving average terms} \\
P = \text{the number of seasonal autoregressive terms} \\
D = \text{the number of seasonal differences} \\
Q = \text{the number of seasonal moving average terms} \\
n = \text{the number of time periods in seasonal cycles (e.g., 12 for monthly time series).}
\]
Given the purpose of this study, SARIMA with intervention analysis was employed to test whether Indiana’s gaming volume was significantly affected by the recession and the lag time and magnitude of the impact if any.

4.1.2 Social impact regression analysis

To better understand the social impact of Indiana’s gaming volume through the recession, this study also performed regression analysis to examine the possible causal relationship between annual payroll employments by annual casino and gaming volumes and to measure the changes in the employment mean levels of the payroll employment through the recession. Two regression analysis were performed on each gaming volume measure for Urban and Rural. Another two regression analysis were employed on statewide coin-in and table drop volume. Two more regression analysis were applied to urban and rural total gaming volume. Finally, this study also examined the relationship between total gaming volume and total casino employment in Indiana using linear regression. A total of nine regression analysis were performed. Annual employment data and gaming volume data were obtained from the website of Indiana Gaming Commission.

4.2 Data Analysis and Results

4.2.1 Impact analysis

As suggested by Bowerman et al. (2005), this study followed a three-step ARIMA fitting procedure: identification, estimation, and diagnostics. Using SAS ETS software, this study fitted SARIMA models on three monthly time series and performed intervention analysis on each of the adequately fitted models to identify and measure the possible
significant impact the recession had on Indiana gaming volume and the lag time of the impact.

For impact and recovery analysis, this study considers the beginning and the ending of the recession, December 2007 and July 2009, respectively, as two external events. Two SARIMA models were applied to each time series, and an intervention analysis was employed on every identified SARIMA models. Therefore, a total of six SARIMA with intervention analysis were performed. For the purpose of this study, the impact was defined as a significant decrease in gaming volume after the recession started; and the impact month was defined as the month a significant decrease was observed. Recovery was defined as a significant increase in gaming volume after the recession ended; the recovery month was defined as the month the significant increase was observed.

This study first develops SARIMA models for identifying the impact of the recession. For the purpose of the impact analysis, monthly data from January 1999 through the month that had the lowest value after the recession started were used. Since slot coin-in and admission reached the lowest level in December 2008, monthly time series from January 1999 through December 2008 were used for model fitting; table drop volume reached its lowest level in July 2008, so monthly time series from January 1999 through July 2008 was used for table drop time series impact analysis.

Initial monthly time series plots in figure 1 suggested that none of the three monthly time series for impact analysis were stationary and all of them showed the strong seasonal pattern as below.
All three time series for impact analysis, however, appeared to be stationary after first order differencing. The results of the Augmented Dickey-Fuller unit root test also suggested the same. P-value for ADF test statistic is less than 0.001 for each of the time series, suggesting that all three-time series can be made stationary after first order differencing.

Trend and correlation analysis for the first differencing on three time series in figure 2 shows that taking first differencing of the data resulted in stationarity and more importantly, there exists strong seasonality on all of three differenced data, which suggests the adequateness of SARIMA models.

Figure 1. Impact Analysis - Time Series Plot Results
This study started examining different SARIMA models with \( d=1 \) and \( D=1 \). Overall 18 relatively simple SARIMA models tested with non-seasonal AR and MA orders no more than 2. Based on the visual investigation of ACF and PACF and AIC, SBC model selection criteria, the best-fitting parsimonious models for coin-in, table drop, and admission monthly time series are SARIMA \((2,1,0)(0,1,1)_{12}\), SARIMA \((0,1,1)(0,1,1)_{12}\), and SARIMA \((0,1,1)(0,1,0)_{12}\), respectively. For admission monthly time series, this study found a more than 40% decrease in admission from July 2002 to August 2002. Therefore, all the data before August 2002 were dropped for the purpose of this study. Table 1 below shows the
parameter estimates for all three model estimates. All parameter coefficients are statistically significant at 0.0001 significance level.

Table 1. Impact Analysis - Summary of Estimates of Model Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Coefficient</th>
<th>t-statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly slot coin-in: SARIMA (2, 1, 0) (0, 1, 1)12 without constant term</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AR1</td>
<td>-0.73094</td>
<td>6.78</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>AR2</td>
<td>-0.46406</td>
<td>-8.65</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>SMA12</td>
<td>0.78368</td>
<td>-5.64</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Monthly table drops: SARIMA (0, 1, 1) (0, 1, 1)12 without constant term</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA1</td>
<td>0.62384</td>
<td>7.43</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>SMA12</td>
<td>0.77311</td>
<td>5.17</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Monthly admissions: SARIMA (0, 1, 1) (0, 1, 0)12 without constant term</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA1</td>
<td>0.70431</td>
<td>7.62</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

In the final diagnostic stage, residuals obtained from the models examined to ensure that models fit time series adequately. For this purpose, this study performed autocorrelation check for residuals to test whether the autocorrelations at lags 6, 12, 18, and 24 of the residuals were uncorrelated (white noise).

As listed in Table 2, p-value for each \( \chi^2 \) test statistics suggests an adequate model except significant autocorrelation of residuals at lag 24 for coin-in SARIMA model. In other words, autocorrelation check for residuals suggested that overall the pattern in the raw time series are identified, and all models for impact analysis fit data adequately.
Table 2. Impact Analysis - Summary of Autocorrelation Check Results

<table>
<thead>
<tr>
<th>Lag</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Models for Impact Identifying</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly slot coin-in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1.6</td>
<td>3</td>
<td>0.6603</td>
</tr>
<tr>
<td>12</td>
<td>10.49</td>
<td>9</td>
<td>0.3121</td>
</tr>
<tr>
<td>18</td>
<td>24.94</td>
<td>15</td>
<td>0.0507</td>
</tr>
<tr>
<td>24</td>
<td>33.93</td>
<td>21</td>
<td>0.0369</td>
</tr>
<tr>
<td>Monthly table drops</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>6.19</td>
<td>4</td>
<td>0.1851</td>
</tr>
<tr>
<td>12</td>
<td>13.06</td>
<td>10</td>
<td>0.2201</td>
</tr>
<tr>
<td>18</td>
<td>20.01</td>
<td>16</td>
<td>0.2199</td>
</tr>
<tr>
<td>24</td>
<td>28.31</td>
<td>22</td>
<td>0.1657</td>
</tr>
<tr>
<td>Monthly admissions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>5.72</td>
<td>5</td>
<td>0.334</td>
</tr>
<tr>
<td>12</td>
<td>16.67</td>
<td>11</td>
<td>0.118</td>
</tr>
<tr>
<td>18</td>
<td>26.28</td>
<td>17</td>
<td>0.0695</td>
</tr>
<tr>
<td>24</td>
<td>32.42</td>
<td>23</td>
<td>0.0917</td>
</tr>
</tbody>
</table>

An intervention event could create significant effects on the behavior of time series, and consequently affect estimates of ARIMA model parameters and specification of the model (Box et al., 2008). To identify any significant impact of the recession on the Indiana gaming industry, this study employed an intervention analysis using an iterative approach and performed intervention analysis repeatedly on each time series until a significant impact was identified or until the end of the time series. The starting month for all impact identifying intervention analysis was December 2007, the starting month of the recession.

The results of SARIMA with intervention analysis identified a significant decrease in table drop volume in December 2007. No significant impacts were found for coin-in slot and admission time series. Results of impact analysis for intervention are listed in Table 3 below.
Table 3. Summary of Impact Identification

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>t-statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact Identified</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly slot coin-in</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No significant decrease has been identified</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monthly table drops</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA$_1$</td>
<td>0.06363</td>
<td>11.54</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>SMA$_{12}$</td>
<td>0.26423</td>
<td>3.41</td>
<td>0.0006</td>
</tr>
<tr>
<td>Month of December 2007</td>
<td>-3,859,954</td>
<td>-4.17</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Monthly admissions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No significant decrease has been identified</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results listed in the Table 3 above indicate that, among the three gaming volume variables, only monthly table drop was significantly affected by the 2007 recession. The effect of the recession on monthly table drop is $3,859,954, indicating that the monthly table drop continuously increased, and the increase could have been $3,859,954 if the structure of the time series was not affected by the recession.

4.2.2 Recovery analysis

This study conducted similar time series analysis for the recovery analysis. The individual visual presentation for each time series in Figure 3 below clearly shows a lack of stationarity of original time series and seasonality among data values.
To achieve stationarity of the data, I took first order difference and checked stationarity again visually and through standard Augmented Dicky-Fuller (ADF) test. ADF test highly rejected the null hypothesis of data being non-stationary. The visual representation of first order differencing also confirmed stationarity of the data after differencing. Since the ACF graph shows some level of seasonality, this study decided to fit SARIMA models for all three recovery analysis time series. Figure 4 shows trend and correlation analysis for three first differenced time series.
Similar to impact analysis, I examined 18 different SARIMA models with different AR, MA, and seasonality terms for recovery analysis. Using AIC and SBC criteria, we found the best-fitting model for each of the three time series. For coin-in, table drop, and admission time series, the best-fitting parsimonious models are SARIMA (2, 1, 0) (0, 1, 1)_{12}, SARIMA (0, 1, 1) (0, 1, 0)_{12}, and SARIMA (2, 1, 0) (0, 1, 1)_{12}, respectively. All parameter coefficients are highly significant at 0.05 significance level, as shown in Table 4 below.
Table 4. Recovery Analysis - Summary of Estimates of Model Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Coefficient</th>
<th>t-statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Models for Recovery Identifying</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Monthly slot coin-in: SARIMA (2, 1, 0) (0, 1, 1)_{12} without constant term</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AR$_1$</td>
<td>-0.73533</td>
<td>-7.96</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>AR$_2$</td>
<td>-0.46122</td>
<td>-4.72</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>SMA$_{12}$</td>
<td>0.59426</td>
<td>4.99</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td><em>Monthly table drops: SARIMA (0, 1, 1) (0, 1, 0)$_{12}$ without constant term</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MA$_1$</td>
<td>0.64117</td>
<td>7.71</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td><em>Monthly admissions: SARIMA (2, 1, 0) (0, 1, 1)$_{12}$ without constant term</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AR$_1$</td>
<td>-0.51775</td>
<td>-5.16</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>AR$_2$</td>
<td>-0.26028</td>
<td>-2.43</td>
<td>0.0151</td>
</tr>
<tr>
<td>SMA$_{12}$</td>
<td>0.57141</td>
<td>4.69</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

In the diagnostic phase, I examined the autocorrelation of residuals at lag 6, 12, 18, and 24 for each of the fitted model to see whether the residuals are white noise. As listed in Table 5, the high p-value for each $\chi^2$ statistic suggests that each model adequately fitted the data and captured the patterns in raw monthly time series.

To perform time series intervention analysis for possible recovery of Indiana gaming industry from recession, this study conducted similar iterative intervention analysis. In this case, the starting month for all recovery identifying intervention analysis was July 2009, the first month after the recession. In other words, to identify possible recovery on each time series, intervention analysis was performed from July 2009, repeated in the following months if no significant recovery was identified until a significant recovery was identified or until the end of the data.
Table 5. Recovery Analysis - Summary of Autocorrelation Check Results

<table>
<thead>
<tr>
<th>Lag</th>
<th>$\chi^2$</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Models for Recovery Identifying</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
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### 4.2.3 Social impact regression analysis

Next, this study examined indirect effect of recession on Indiana casino’s payroll employment as testing the possible social impact of gaming industry by recession. Since the possible lag time of the effect, this study examined time period 2008 – 2011 as the possible effecting year on the casino employment. If recession has affected Indiana casino industry, this study believes that Indiana casino employment will be affected as well. This statement, however, needs to be examined before making any further judgments and conclusion.

In order to achieve this goal stated above, this study conducted linear regression analysis. Annual urban, rural, and total casino employment data along with annual gaming volume for coin-in and table drop were collected from Indiana Gaming Commission annual reports, which are publicly available on their website. Since this study assumes that there is a
causal relationship between casino gaming volume and casino employment, this study regressed casino employment against gaming volume from different aspects of gaming volume. To include recession effect to the linear regression, a dummy variable was introduced in each linear regression. Four different dummy variables, as listed in Table 6, tested separately.

Table 6. Summary of Dummy Variables

|----------------------|--------------|--------------|

For each annual data values, this study iteratively tested above four dummy variables to identify the changes in mean levels of employment during different time periods. If none of the coefficients of the dummy variables are significant, this study concludes that there is no significant effect of recession on casino employment. This study predicted that no significant impact occurred since Indiana casino has not affected by the recession (except table drop) based on the conclusion reached in impact and recovery analysis. The test models are listed in the Table 7 below.
Table 7. Summary of Different Models

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<tr>
<th>Models</th>
<th>Dependent Variable</th>
<th>Independent Variable</th>
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<td>Model 1</td>
<td>Urban payroll employment</td>
<td>Coin-in (Urban)</td>
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<td>Rural payroll employment</td>
<td>Coin-in (Rural)</td>
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<td>Urban payroll employment</td>
<td>Table drop (Urban)</td>
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<td>Table drop (Rural)</td>
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<td>Model 5</td>
<td>Urban payroll employment</td>
<td>Total volume (coin-in + table drop)</td>
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<td>Model 6</td>
<td>Rural payroll employment</td>
<td>Total volume (coin-in + table drop)</td>
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<td>Model 7</td>
<td>Casinos' total payroll employment</td>
<td>Coin-in (statewide)</td>
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<td>Model 8</td>
<td>Casinos' total payroll employment</td>
<td>Table drop (statewide)</td>
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<td>Model 9</td>
<td>Casinos' total payroll employment</td>
<td>Total Gaming Volume (coin-in + table drop) – Statewide</td>
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This study examined each of these nine models (each model iteratively tests four dummy variables) to identify potential effect of the recession on payroll employment in different time periods. Kolmogorov-Smirnov tests (K-S) and Durbin-Watson tests (D-W) were performed to check the normality and serial correlations in the residuals. Results of the linear regression are listed in Table 8. The results of Durbin-Watson tests are overall around 2 and suggest error terms from regression models are white noise, indicating an adequate fit. Furthermore, at 5% significance level, p-values of all the K-S tests indicate that the residuals in all regression models are typically distributed, again suggesting the adequateness of the regression models for the data set. Adjusted $R^2$ for all models are higher than 80%,
suggesting that more than 80% of the variation in employment data is captured by the change of the corresponding gaming volume in each model and dummy variable.

All four dummy variables for each of the nine linear models are insignificant, except model 3, which is urban table drop-urban employment relationship regression models. Those results indicate that the mean value of Indiana urban employment in 2009 and beyond was shown to be significantly lower than what it was before 2009. This result is also partly consistent with the SARIMA with intervention analysis for table drop, where a significant decrease in table drop has been identified due to the recession. Furthermore, the mean levels of employment associated with different time periods and gaming volume have not been affected in all other eight tested cases.

4.3 Discussion

The economic downturn of the 2007-2009 recession made many gamblers more cautious with their income. The gaming industry in America was hit extremely hard by the 2007-2009 recession, as the amount of discretionary spending and travel of many gamblers decreased during the time of the recession. Already, signs of economic pressure were being shown before the economic downturn of the recession in the United States, rising oil prices to all-time highs caused the amount of times travelers took trips, and with the market for loans and credit becoming less accessible many hospitality facilities began to suffer (Edwards, 2009). Leading up to the final financial quarter of 2008, the United States of America began to feel the economic pressures and realities that it was in the middle of a major economic downturn that had started in December of 2007 and was the worst recession since the end of World War II (Roubini, 2009).
## Table 8. Summary of Regression Analysis Results

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<td>p-value</td>
<td>Adj. R² (%)</td>
<td>F-Stat.</td>
<td>p-value</td>
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4.3.1 Gaming volume in a non-destination gaming state

The first research objective was designed to establish if the 2007–2009 recession affected gaming volume in a non-destination gaming state during the economic downturn. First, it is apparent from the various time series analysis that the 2007-2009 recession caused by the economic downturn which occurred between 2007 and 2009 did not impose any significant impact on the gaming volumes in Indiana. Statistical analysis further indicate that the monthly average gaming volume which includes table drop and coin-in depicted only a relatively minor drop in Indiana during the 2007 to 2009 period compared to the monthly average gaming volume during the 1999 to 2007 period previous to the 2007-2009 recession and was not statistically significant. This because if this period is compared to other periods such as in 1999 to 2007 statistical analysis indicate that the average monthly gaming volume was not significantly affected during the 2007 to 2009 recession in Indiana. The statistical analysis pertaining to the gaming volume in the state of Indiana a non-destination gaming state is perhaps representative of gaming volumes in other non-destination gaming states during the recession of 2007-2009 as was found in Iowa following Zheng et al. (2013) investigation into gaming volume in that non-destination gaming state which concluded similar findings.

Therefore, assuming that Indiana a non-destination gaming state is representative of what took place throughout the United States in non-destination gaming states during the 2007 to 2009 recession shares that the economic downturn did not impact gaming volumes in non-destination gaming states during the economic downturn as significantly as destination gaming states.
However, it would seem that this assumption is in part premature as statistical analysis conducted in certain urban areas which are centered on the gambling industry may have indicated that Indiana was not truly representative of all the areas within the state; although destination gaming areas such as Atlantic City and Las Vegas offered different outcomes to those depicted in Indiana. Further discussion on these two destination gaming cities follows later in this chapter.

4.3.2 Casino employment in a non-destination gaming state

The second research objective sought to determine the measurement of casino employment during the 2007–2009 recession in a non-destination gaming state. Data which was also supported by statistical analysis indicated that there were almost no changes in rural or local employment not only during the 2007 to 2009 recession but also in the post two year period which followed. However, urban casino employment was negatively affected albeit relatively low compared to the decrease in employment in other employment sectors in the same period which was extensively covered by mass media and is therefore commonly known within the public domain.

Multiple analysis of the statistical data pertaining to employment levels suggest that the negative impact of the recessionary period from 2007 to 2009 was more evident in the urban areas as opposed to what was found in the more rural or local areas. Therefore, it is clear that the first research objective concerning how the 2007–2009 recession affected gaming volume in a non-destination gaming state during the economic downturn was achieved in part. This is because it would appear that the impact was limited to certain city areas or areas of high density population groups whereas the rural areas were largely
unaffected by the 2007 to 2009 recession. Upon reflection, it is suggested that this research objective should have been split into two research objectives; one focused on urban areas and the other focused on rural areas.

4.3.3 Implications

The statistically proven data suggests that despite the widespread effects of the recession during 2007 to 2009 and its relatively low impact on the gaming industry in terms of monthly average gaming volumes that disposable income in urban areas may have been reallocated more towards entertainment such as gambling at the expense of other lifestyle choices such as daily living expenses, housing, health and education. This is because employment levels in urban areas were negatively impacted during this recessionary period yet the monthly average gaming volumes were only slightly impacted.

This suggests that the second research objective pertaining to the impact on employment was achieved and therefore justified because of the higher impact on employment was higher in urban areas than in rural areas. Again, in retrospect, the second research objective should have been designed as two separate research objectives; one objective allocated to the impact of employment in urban areas and the other objective focused on how the recession impacted employment levels in rural areas.

Indiana’s gaming volume during the economic downturn of the 2007-2009 recession is a reflection of statewide dollars that were gambled during the economic downturn of the 2007-2009 recession. The results of this studies impact analysis on the economic downturn on gaming volume in Indiana, which tested for the implications of the 2007-2009 recession showed a decrease of $3,859,954 in gaming identified as table drop volume. While this
decline is statistically significant, it is not significant compared to Indiana’s average monthly
table drop volume of $179,769,318 from 1999 – 2007. Furthermore, it is not significant when
compared to Indiana monthly average gaming volume (coin-in plus table drop) of
$2,132,620,999 from 1999-2007. Therefore, the overall results of this study suggest that
Indiana’s gaming industry was not significantly affected by the recession.

Regression analysis also supported the conclusion reached above. Including dummy
variables in regression analysis as an indicator of recession effect and lag time effect,
different regression models all suggest no significant change in casino employment in 2008
through 2011, except urban employment – urban table drop relationship model. It may
suggest that the economic downturn affected urban table drop gaming volume more than it
affected table drop in rural areas and was a catalyst for employment layoffs on casino gaming
floors in Indiana’s urban areas.

Regression results are overall consistent with those of ARIMA with intervention
analysis. ARIMA with intervention analysis identified a significant decrease in table drop in
December 2007. The social impact of the recession on the table drop is partly captured by the
regression model that explores the relationship between urban employment and urban table
drop, which suggests a significant decrease in urban casino jobs in 2009.

The economic downturn caused by the recession of 2007-2009 resulted in an almost
ten percent cut in national expenditures in all sectors of the national economy – to less than 8
trillion dollars in 2008 (Raymond, 2013). While it was hardly an issue for those who
considered gambling as a part of their lifestyle or even considered it professionally, the
majority of the gamblers who did not no longer considered this section of their cash outflow
a priority. This is a significant component of the crisis which shaped the gaming industry landscape in most destination gaming locals across the US at the end of the past decade.

Moreover, the assumption can be made that the ten percent reduction by federal and state authorities on national expenditures throughout all the different sectors of the United States economy impacted urban areas more than was experienced within rural areas. Moreover, it would seem that the relatively low impact of the 2007 to 2009 recession in rural areas suggests that these areas were dependent on the gaming industry and were not so impacted by the reduction in federal spending, therefore as the monthly average gaming volumes were not unduly impacted their ability to spend money on gambling was not unduly impacted nor were their levels of employment negatively impacted.

There are not two gaming destinations in the continental United States that are more reliant on their consumers traveling more than 50 miles from their homes to gamble then Atlantic City, NJ. and Las Vegas, NV, essential to this study they reflect destination gaming locals compared to Indiana a non-destination gaming destination. Although the economic downturn caused by the 2007-2009 recession proved to be insignificant on gaming volume in the non-destination gaming state of Indiana both destination gaming cities of Atlantic City, New Jersey and Las Vegas, Nevada both recognized decreased gaming volume during the 2007-2009 recession.

While both Atlantic City and Las Vegas which are gambling destination locations are not the direct focus of the two research objectives it is appropriate to note that both of these gaming locations had experienced a decrease in gaming volumes prior to the 2007 to 2009 recession. This suggests that the significant decline in gambling during this recessionary period was worsened by an already slow decline in the gaming industry in gambling
destination locations and that this recession was not entirely for the almost twenty percent
decline in gaming volumes or for the drop in employment figures. Moreover, the decline in
tourism and travel during the latter part of this period would serve to weaken the ability of
gambling destination locations to attract their clients. As noted earlier in this chapter, these
two highly densely populated urban areas are different to Indiana; a non-destination gaming
location. Both research objectives sought to gain understanding of how the 2007–2009
recession affected gaming volume and casino employment in a non-destination gaming state
during the economic downturn. Upon reflection these objectives could have been expanded
to determine the levels of impact by the 2007 to 2009 recession on destination gaming
location such as Atlantic City and Las Vegas. In addition, according to statistical analysis,
while the non-destination gaming location of Indiana depicted relatively lower impact on
gaming volumes and employment during the 2007 to 2009 recession, gaming destination
locations were more affected.

The Chicago area is a prime market for Northwest Indiana casinos. The five casinos
along Northwest Indiana's lakeshore are surrounded by suburban Chicago (Steele, 2016).
The same can be said for rural Indiana casinos which rely on the drive in markets of both
Cincinnati, Ohio and Louisville, Kentucky. Three of the five rural casinos in Indiana are
within fifty miles of both cities. As reported, competition does not merely occur between
separate entities, e.g. casinos, gambling halls, etc., but locations. Illinois and Ohio are two of
the regional markets that continue to expand their gaming operations and compete for casino
market share with Indiana. Indiana has been susceptible to decreased gaming volume based
on the introduction of gaming in neighboring states like Illinois and Ohio. Many gamblers
who once flooded southeast Indiana's three riverboat casinos spent their money in Ohio
during the past year. Due in large part to the emerging gaming competition in Ohio, which legalized gaming in 2012, gaming revenues were down $242.5 million in Indiana the past 11 months, leading to lower state tax collections and, in many cases, reduced payments to the local communities that rely on gambling cash to pay for a significant portion of their services (Sikich, 2014). This is not the first occurrence of this behavior in the gaming markets in the United States. Both the slot coin-in and drop table models reported a significant decrease in Atlantic City gaming volumes at the onset of legalized gaming in Pennsylvania (Repetti & Jung, 2014). Although, few studies have examined and quantified the impact that a change in one state’s legalization of casinos has on another state, or how a change in legalization impacts gaming of the same type in another state (Nichols, 1998).

Thalheimer and Ali (2008) examined slot machines at casinos in Iowa, Illinois, and Missouri, from 1991-1998. The authors introduced a variable of “ease of access” and found that when access to competing casinos increased, the demand at a particular casino decreased. Thalheimer and Ali (2008) further found that slot machine win and total win significantly decreased with competition from other riverboats and racinos. The competitors in this study included cross-border casinos in Indiana and Missouri and intrastate casinos within Iowa. Walker and Jackson (2007) also found a negative impact of nearby state casinos on adjacent state commercial casino revenues. Casinos certainly make that point where they just start essentially cannibalizing each other (Nichols, 1998). Although, each gaming market not only has a different customer mix, such as table and slot players but also attracts their customers from various locations. Overall, access to gaming becomes a competitive disadvantage for a non-destination gaming destination like Indiana, who has continued to see declines in its annual gaming volume from its peak gaming revenue year of 2007. Also,
changing demographics and attitudes of gaming customers towards casinos and gaming also continue to threaten Indiana gaming revenue.

The Las Vegas Convention and Visitors Authority study of visitors showed that 87 percent of Silent Generation visitors (born 1946 or earlier) gambled, while only 63 percent of Millennial generation visitors (born 1981-1993) gambled (Steele, 2016). Steele (2016) also shared that members of Generation X and the Millennial generation expect a more social, group-oriented experience, and casinos need to incorporate that onto the slot floor. To respond to these changes casino, operators are pushing slot machine manufacturers to include a social element as well as a skills based element into electronic gaming (Steele, 2016).
CHAPTER 5 SUMMARY AND CONCLUSIONS

5.1 Summary

Although the research objectives pertaining to non-destinations may have in part been achieved, it raises the question regarding how much Indiana represents all of the non-destination gaming states in the US. This offers an opportunity for further research to be conducted so that in terms of the gambling industry and a economic downturn such as what occurred in the 2007 to 2009 period, how much of the US gambling industry was impacted nationally in terms of non-destination gaming locations and gaming destinations.

Another factor was appears to have impacted both gaming destination locations and gaming non-destination locations pertains to the element of competition. Other nearby states have invested into the gambling industry which in turn has brought pressure to bear on both non-destinations and destination gaming locations traditionally associated with the gaming industry. This may serve to explain why statistical analysis pertaining to gaming volumes and employment in Indiana may have been slightly impacted during the 2007 to 2009 recession period; this increased external competition rather than the small decline being attributed to the recession. Moreover, evidence points to non-destination gaming locations such as Indiana being more vulnerable to external competition than was found in gaming destination locations such as Atlantic City. Although, it should be noted that Atlantic City experienced a decrease in gaming volumes prior to the 2007 to 2009 recession. This suggests that the significant decline in gambling during this recessionary period was worsened by an already slow decline in the gaming industry in gaming destination locations like Atlantic City and that this recession was not entirely responsible for the almost twenty percent decline in
gaming volumes or for the drop in employment figures there. Moreover, the decline in tourism and travel during the latter part of this period would serve to weaken the ability of gaming destination locations to attract their clients.

The Indiana and US economy suffered tremendously during the 2007-2009 recession. Individuals’ personal consumption expenditures in 2009 showed that consumers were reported to spend below $9.0 trillion in the second quarter of the financial year, officially the last official quarter of the recession. This was the lowest personal consumption expenditure value registered in the economic downturn. Services were particularly affected, especially transportation, food services, recreation, and financial services (United States Bureau of Labor Statistics, 2009). Of the top 10 largest and most rapid consumer-related employment declines from 2007 to 2010 the industry with the biggest job declines were services (Barello, 2014). This demonstrates the changing in consumption patterns for non-destination gaming compared to destination gaming locals when unemployment is high. The 2007-2009 recession is one of the longest on record. Consumption plunged during the recession of 2007-2009 leading Americans not only to postpone expensive purchases of durables but also to change their leisure habits and cut back even on subsistence spending. According to Barello (2014) three main indicators may potentially affect the target audience of the gambling industry:

- Unemployment rate – job loss is not a factor that would normally contribute to the expansion of gambling. Certain categories of players may try to gamble to increase their net worth in time of crisis. However, this can hardly be defined as a significant trend.
- Expenditures – crisis may affect the monetary volume of personal expenses. Since corporate or governmental funds are rarely being used for the purpose of gambling, this is a significant factor explaining the general trend.

- The structure of spending – in time of economic turmoil the very priorities on desirable transactions may be considerably different from a normal pattern.

In other words, a considerable amount of potential gamblers were left behind during the recession (Barello, p. 10). Specifically, in Indiana, unemployment peaked at 10.8 percent (Woodland, 2013). Indiana’s manufacturing sector, who was the largest source of job loss during the economic downturn of the 2007-2009 recession had a decline of nearly 60,000 jobs, most of which were directly related to the decrease in the automobile business during the recession (Kinhorn, 2014). General Motors, a leader in the automotive sector in the United States filed for bankruptcy and with one plant closing in Indiana during the recession, displacing 754 out of 7,411 total employees in Indiana. In this case, one employment cutback resulted in over 10% of the Indiana’s General Motors workforce were laid off during the 2007-2009 recession (Woodward, 2013). According to the Bureau of Labor Statistics, workers in Indiana saw a decline in hours of one hour per week between 2007 and 2009 (Hicks, 2011). As workers are laid off or displaced, the relationship between unemployment and foreclosures can be clearly recognized. This means that as the unemployment rate rises, the total number of foreclosures also increases. According to Hicks et al. (2011), Indiana had 7,972 homes on the market as foreclosures at its highest. The economic picture of Indiana through the 2007-2009 recession was not bright, it was, in fact, cloudy, but Indiana’s gaming industry was at least clear, if not sunny.
Gaming industry employment in Indiana was not significantly affected by the economic downturn of the 2007-2009 recession either. In fact, this was essential in their local gaming communities in that their local casino employees were gainfully employed during this recession of the 2007-2009 recession. Although private employment is not always enough to create an economic stimulant in a community. Since the 2007-2009 recession, the federal government had distributed nearly $787 billion dollars through the American Recovery and Reinvestment Act of 2009. From February 17, 2009, to December 31, 2010, Indiana received over $4.5 billion, which the Federal Office of Management and Budget (OMB) estimate created 10,974 jobs for the state (Barelo, 2013).

The recession of 2007-2009, as it has been already mentioned throughout this research, was an economic downturn of substantial proportion for both the Indiana economy and the national economy. It has had a considerable influence on the structure of personal expenses and gaming priorities for individuals. There has been a substantial lag between the moment of the initial impact of the recession and the change of consumerist pattern, partially because people still had savings and available instruments of credit for another year after the crisis was conceived. For this reason, the main events in this regard happened within the interval of recession from 2007-2009. While disposable personal income decreased, partially due to job losses and limitations, partially because of a conscious choice of a given consumer, the components of consumption may have also been re-prioritized and non-destination gaming states like Indiana may have benefited from consumers deciding to game closer to home.

So, it may be inferred that the recession of 2007-2009 had a significant and comprehensive impact on the revenues and perspectives of the destination gaming industry
more than the non-destination or local gaming industry like Indiana. This impact, however, was uneven, as some locations and entities have suffered a greater impact than others. Once again, it mostly depended on the chosen business model, as well as adjacent hospitality services.

5.2 Conclusions

Indiana a non-gaming destination state was not significantly affected by the recession regarding gaming volume. There was not significant effect from the recession on the statewide, urban or rural coin in. Also, no significant impact on statewide, urban or rural attendance at casinos was recognized. Although there was, a significant effect on statewide table drop, it was not significant compared to the historical gaming volume in the state of Indiana and no significant table drop decrease was recognized in either urban or rural casinos. Moreover, casino employment in the state of Indiana during the recession was not significantly affected, but this was not normal employment behavior in Indiana which suffered several job layoffs during the 2007-2009 recession. Except in one analysis where the urban casinos of Indiana suffered a statistical decrease in table drop a decline in employment was recognized therefore Indiana gaming employment is found to be resilient in the face of an economic downturn.

Statistics have indicated that destination gaming locations have been more negatively impacted by the recession due both to a drop in gaming volumes and lower employment figures while not so affected by the potential impact of external competition. The opposite seems to be true for non-destination gaming locations such as Indiana which were more
affected by external competitors and less by external national and international economic factors.

This dissertation supports Zheng et al. (2013) findings that a non-destination gaming state is not significantly affected by an economic downturn. Indiana, another non-destination gaming state during the economic downturn of the recession, proved again, that gaming volume was not significantly affected by the 2007-2009 recession. The gaming industry in Indiana was, therefore, resistant to the economic downturn of the 2007-2009 recession. The findings in this study were that an insignificant decrease in table drop gaming was found and that no significant change in slot coin-in gaming was recognized as a result of the 2007-2009 recession.

Results indicate that while there was a slight drop in gaming revenue and employment figures during the economic downturn of the 2007-2009 recession, Indiana proved relatively resilient to the recession but the research suggests that Indiana is vulnerable to external factors such as emerging competition from neighboring states. Evidence suggests that the gaming industry located in urban counties of Indiana were more likely to have been impacted by the decreased casino employment environment during the 2007 to 2009 recession than was evident in the rural areas in which the gaming industry is located. Questions still remain regarding if the statistical analysis conducted into the gaming industry of this one non destination gaming state is representative of the effect of the recession on the national gaming industry because in part not all states are viewed as non-destination gaming locations.

Although this research does report that some casino employment did, indeed, suffer as a consequence of the recession, it was specific to the urban areas of Indiana where table
drop also saw a significant decrease. Similar to the findings by Garrett (2004), where he shared that casino employment opportunities were found to be much greater in rural counties that had adopted casino gaming as a primary or predominant industry than they were in the area of metropolises during the 2001 recession.

This study continues in the development of investigation into the economic and social impacts of gaming in non-destination gaming states like Indiana and additionally adds an investigation into urban and rural gaming areas. Also, it moves towards a further validation of the methodological approach of time series investigation into gaming volume and employment impact during economic downturns for the reliable forecasting of capacity and revenue management for casinos and their communities into the future.

This research highlights the fact that the non-destination gaming industry in general is, recession proof and vital to the economy of states and communities where gaming is an essential form of revenue and employment like Indiana. Local governments near casinos rely on casino revenue for the central city, county and town services such as fire protection, roadwork, and infrastructure (Steele, 2016).

The larger, theoretical, implications of these findings are also worth reporting. Casino customer spending on gaming represents a portion of discretionary spending budgets in most cases. The findings suggest that discretionary spending budgets do not disappear in an economic downturn and that their interests in gaming do not significantly change either. Instead, consumers look to find less expensive ways to spend their discretionary dollars in the same way as they were before an economic downturn sets in.

Although, research objectives pertaining to a non-destination gaming state like Indiana may have in part been achieved, it raises the question regarding how much Indiana
represents all of the non-destination gaming states in the US. This offers an opportunity for further research to be conducted so that in terms of the gambling industry and an economic downturn such as what occurred in the 2007 to 2009 period, how much of the US gambling industry was impacted nationally in terms of non-destination gaming locations and gaming destinations.

Another factor was appears to have impacted both gaming destination locations and gaming non-destination locations pertains to the element of competition. Other nearby states have invested into the gambling industry which in turn has brought pressure to bear on both non-destinations and destination gaming locations traditionally associated with the gaming industry. This may serve to explain why statistical analysis pertaining to gaming volumes and employment in Indiana may have been slightly impacted during the 2007 to 2009 recession period; this increased external competition rather than the small decline being attributed to the recession. Moreover, evidence points to non-destination gaming locations such as Indiana being more vulnerable to external competition than was found in gaming destination locations such as Atlantic City. Although, it should be noted that Atlantic City experienced a decrease in gaming volumes prior to the 2007 to 2009 recession.

So, it may be inferred that the recession of 2007-2009 had a significant and comprehensive impact on the revenues and perspectives of the destination gaming industry more than the non-destination or local gaming industry like Indiana. This impact, however, was uneven, as some locations and entities have suffered a greater impact than others. Once again, it mostly depended on the chosen business model, as well as adjacent hospitality services.
A limitation of this study was that it examined only a single non-destination gaming state with urban and rural casinos. Comparing another non-destination gaming market with both urban and rural gaming locals to Indiana’s would help better understand how other non-destination casino destination performed based on population density in similar states during an economic downturn. Also, future research should be conducted on casino employment behavior during economic downturns using a time series with intervention analysis to help support local policy and economic development officials in their economic forecasting. Specifically, in areas where casinos are responsible for employing a high percentage of residents within the communities where the casino is located. Due to the increased wages and taxes found in areas where gaming exists the social impacts of employment through an economic downturn is increasingly important.
REFERENCES


