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The Effect of Gambling Expansion on Health

by

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Submitted in partial fulfillment
of the requirements for the degree of
Master of Arts in Economics, Hunter College
The City University of New York

2016

Thesis Sponsor:

May 5, 2016

Date

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May 5, 2016

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Abstract

This study examines the effect of gambling expansion on general, mental, and physical health, as well as being a smoker, and being at risk of binge drinking. Examining this relationship will help better understand how gambling expansion affects local community health as a whole. This paper hypothesized gambling expansion decreases individual's general, mental, and physical health, increases probability of being a smoker, and increases probability of being a binge drinker. The study is done by observing the health and health behavior of individuals living in and outside of a casino or casino hotel counties. Findings from this paper are done with data from the Behavioral Risk Factor Surveillance System and the County Business Pattern and these results support hypothesis gambling expansion decreases mental and physical health, increases being at risk of binge drinking and being a smoker. However, general health results does not support the hypothesis.

Introduction

America has seen a rapid expansion of the gaming industry in recent years. In 2003, commercial casinos were available in only 11 states, and Native American tribal casinos operated in 28 states (American Gaming Association, 2004). By 2012, the number of legal commercial casinos increased to 22 states, while tribal casinos stayed legal in 28 states (American Gaming Association, 2013). Expansion of casinos has been praised for creating more than 300,000 jobs in commercial casinos alone and generated billions of dollars in tax revenue, although casino expansion has caused various health concerns (Kearney, 2005; Gros & Legato; 2010).

Excessive gambling could result in pathological or problem gambling. Pathological gambling is the clinical term for severe problematic gambling; this paper refers to all levels of problematic gambling as problem gambling. Sevigny et al., (2008) conducted two studies observing the association between the increase of pathological gambling with casino expansion, and found conflicting results. Dalton et al., (2012) finds gambling expansion affects general and mental health negatively and mentions about the association between lower physical health. Nevertheless, it is important to explore how gambling expansion affects individuals who live in a local county. Many previous studies have investigated the relationship between pathological gambling and health, but few have studied the general public as a whole, which include people whose health has been directly and indirectly affected by gambling. Most studies use screening tools for pathological gambling to determine how individuals' are affected by gambling such as Lee et al., (2008)

This paper aims to study the effect gambling expansions have on the surrounding population's cigarette smoking, alcohol intake, as well as their general, mental, and physical

health. In most previous analysis, pathological gamblers are studied separately from their wives and children. Only Suomi et al. (2013) examined pathological gamblers and family members together, though they only observed a small sample of 300 to 400 people (Hsu, Lam, & Wong, 2014; Mazzoleni et al., 2009; Suomi et al., 2013). My data comes from a large microdata sample of millions of U.S. residents that looks at the effects of gambling expansions on health. A screening test would be too time consuming for such a large sample. Screening instruments prevalence rates are different, and have varying levels of error that are affected by the instrument used (Williams, Volberg, & Stevens, 2012). Again, this report studies the community's general, mental, and physical health, binge drinking, and smoker status of population surrounding casino expansions. Smoking and drinking are often correlated with gambling, which is why these two health behaviors are often studied with gambling together (Shinogle et al., 2011; Gonnerman & Lutz, 2011). As more and more casinos open their doors the local population is more likely to engage in binge drinking, and smoking, as well as experience a decline in health.

A Poisson model is used to analyze the effects of casino expansions on health, and a logit model is used to assess the effects of casino expansions on health behaviors, both at the county level. The first section, which is the literature review, concerns the relationship of gambling with health and health behaviors, and shows how casino participation increases with respect to proximity. The second section describes the data used in this investigation. The third section talks about the method being used and why this method is appropriate. The fourth section discusses the results, followed by the fifth and final section which talks about the limitations of this research and the conclusions that can be drawn from it.

Literature review

Problem gambling has been recognized to affect mental health since 1980 when the American Psychological Association added pathological gambling to the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) (Temcheff, Derevensky, & Paskus, 2011). The DSM-III defines pathological gambling as a mental disorder that disrupts individuals' family, personal or vocational pursuits and money-related issues (Reilly & Smith, 2013). Findings from McComb, Lee, & Sprenkle (2009) shows:

Although most Americans gamble responsibly, the National Council on Problem Gambling (2009) estimates that nearly 2 million people (approximately 1% of the population) in the United States meet the Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revision (DSM-IV-TR; American Psychiatric Association, 2000) criteria for pathological gambling, and another 4–6 million people (2–3% of the population) have a less serious but still significant gambling problem.

Smoking and binge drinking are also common in problematic gamblers (Koo et al., 2008; Walker, Clark, & Folk, 2010). According to Walker et.al., (2010) there is a 20% increase in probability of binge drinking in individuals who gamble, compared with non-gamblers. Smoking rates are high among problem gamblers, as well as among casino employees (Rodda, Brown, & Phillips, 2004; Shaffer, Vander Bilt, & Hall, 1999). Since both smoking and binge drinking are negative health behaviors strongly correlated with gambling, these two behaviors will also be considered when examining the impact of gambling expansion on health.

Family members of pathological gamblers also experience lower levels of mental health. Wives of pathological gamblers have higher levels of anxiety and depression (Mazzoleni et al., 2009). Family relationships can be difficult among gamblers who are unable to control their excessive gambling behavior, for it may cause stress, anxiety, and violence (Suomi et al., 2013; Dowling et al., 2014). Violence may be linked to physical health, while stress and anxiety may

be linked to mental health. Overall health and negative health behaviors, specifically smoking and drinking may be the results of casinos in the area.

Sevigny et al., (2008) suggests that the closer a population of people are to casinos, the more likely they are to gamble. The American Gaming Association's State by State press release (2010) shows that 63% of casino goers visit local casinos. According to Plume (1998), New Orleans and St. Louis casinos attract more local gamblers than tourist gamblers, which suggests the important role locals play in gambling revenue. Casino workers, are more likely to become pathological gamblers, since they are highly exposed to the gambling environment (Shaffer & Hall, 2002; Shaffer, Vander Bilt, & Hall, 1999; Dalton et al., 2012). All evidence suggests that individuals who reside in a county with nearby gambling facilities will be more likely to gamble. As the likelihood of gambling increases, so does the probability of pathological or problem gambling.

Different types of casinos may make a slight difference on its effect on consumers. Hotel and resort casinos offer gambling as part of a rich, luxurious experience, which also includes "restaurants, rooms, spas, and entertainment" (Gros & Legato, 2010). In some cases, the non-gambling business generates more revenue than the gambling business (ibid). From 2007 to 2012 the share of visitors to Las Vegas resort casinos that are not on vacation to gamble ranged from 39% to 51% (LVCVA, 2011; LVCVA, 2013). The casino industry is separated into pure casinos and hotel casinos by the County Business Pattern (Census). The hotel casino may have gambling business, but its primary business is to provide short term lodging (Census). Therefore, data separating these two types of casino establishments can better assess the effect gambling expansions have on the population.

Data

Data from the Behavioral Risk Factor Surveillance System or BRFSS, and County Business Pattern or CBP are merged together on the county level to assess what relationship gambling expansion has on general, mental, and physical health, as well as smoking and at risk binge drinking. The County Business Pattern survey contains data on industry establishments, industry employees, and total employed in county. The Behavioral Risk Factor Surveillance System is a survey that contains data about U.S. residents' health-related risk behaviors (Center for Disease Control).

The BRFSS data is a pooled cross sectional non experimental dataset, ranging from 2003 to 2012 on a county level collected from 50 U.S. states, the District of Columbia, and 3 U.S. territories. This study excludes U.S. territories. The BRFSS survey, which is found in the Centers for Disease Control and Prevention website and is run by state health departments, and then merged to form national data. This survey pertains only to individuals from ages 18 and older living in a household with a telephone since the BRFSS used a telephone-based method for sample selection. The state and county of the respondent is provided with the household phone number. Individuals who do not live in counties of casinos or hotel casinos are also included in both datasets. ¹

The CBP data is from the Business Register database, which gathers employee information and establishment for each industry from the Internal Revenue Service (IRS). The Business Register uses Employer identification numbers provided by the IRS to classify establishments and taxpayers under a specified industry. An establishment is not necessarily a single company or enterprise; according to the Business Register, it is a place where businesses

¹ The BRFSS data is obtained from Center of Disease Control

or services are conducted. Certain counties do not disclose the number of employees in casino or casino hotel industry; instead they disclose the number of employees in ranges². This study uses the lowest boundary of each range to represent the number of employees in the industry for a conservative estimate³.

Casino establishments within a county tell how many gambling enterprises are in the community, and the employee number will explain the size of the business and how much of an impact it has on locals. The sample is from the BRFSS. The demographics data shows: the population range from ages 18 to 99; age-squared⁴; gender (male and female); race (White, Black, Asian, Pacific Islander, Native American, Hispanic, other); education (graduated college or technical school, attended college or technical school, graduated high school, did not graduate high school); marital status (unmarried couple, never married, separated, widowed, divorced, married); employment (retired, student, self-employed, out of work for 1 year, out of work for more than 1 year, employed for wage). Data relating general health are categorized as excellent, very good, good, fair, poor; mental health reveals the number of days a person's mental health was poor during the past 30 days. Physical health shows the number of days physical health poor during the past 30 days. The data shows being current smoker, and at risk of binge drinking⁵.

By combining CBP data from 2003 - 2012 with BRFSS data of the same range of years, state, county, newly combined dataset will give each observation information about whether he or she resides in casino or casino hotel county, the number of casino or casino hotel employees and the number of all employees in the county⁶. The CBP data contains all industry

² Ranges are: 0-19, 20-99, 100-249, 250-499, 500-999, 1000-2499, 2500-4999, 5000-9999, 10000-24999

³ County Business Pattern data is obtained from U.S. Census

⁴ Age-squared is derived by squaring age of BRFSS sample observations

⁵ The BRFSS data descriptions were obtained from BRFSS Codebooks from 2003 to 2012.

⁶ In order to merge CBP and BRFSS data, the year, state, county must be the same between the datasets

establishments with number of employees from 50 states on a county level. For the purpose of this study, only casino and casino hotel industries are being used. The main explanatory variables from this paper are: establishment per 1000⁷ and industry share of employment⁸. Because the casino industry (represented by NAICS 713210) and the casino hotel industry (represented by NAICS 721120) are treated separately, two separate datasets are being investigated.

For this study smoking, drinking, general, mental, and physical health are being treated as dependent variables. The explanatory variables are industry share of employment or establishment, age, race, gender, employment status, and marital status. Time ranges from 2003 to 2012 for data collection. Gambling establishments represent the availability of casinos in a county and share of employment shows the relative importance of casinos or casino hotel in a given county, both are important measures of gambling expansions. Gender, race, marital status, employment status are all dummy variables of 0 and 1. The variables: male, white, employed for wage, married are dropped from regressions to prevent collinearity. Industry shares of employment, age, age-squared, are all numeric variables. The general health numeric representation ranges from 1 to 5 with 1 being excellent health and 5 being poor health. Mental health and physical health are determined by numeric numbers ranging from 0 to 30 days mental or physical health not well. These three health variables are count variables.

Method

This paper uses the Poisson model to examine how casino and casino hotel expansions affect health. The Poisson model is appropriate to model count data. The independent health variables are numeric, and the ordinal nature of the dependent variables makes Poisson a better

⁷ Establishment per 1000 is derived by dividing CBP's establishment variable by 1000.

⁸ Share of employment is derived by using CBP's industry employee divided by total employees employed in county

model than multinomial logit or probit. This is also better than ordinary least squares because it does not take into account the categorical nature of the data. Marginal effects are shown to indicate the impact of a unit change in the share of casino and casino hotel employees or of the number of establishments per 1000.

A logit model is used to analyze the impact of casino and casino hotel expansions on binge drinking and smoking. At risk binge drinking and current smoking status are dummy variables, which makes them categorical. Logit model is best used for analyzing categorical data of 0 and 1. The marginal effect⁹ of logit gives better insight into the results; therefore regression tables only show marginal effects for at risk binge drinking and smoking.

There are two sets of data, one for casino industry and one for casino hotel industry, each with Poisson regressions for health and logit regressions for health behaviors. There are also two regression forms, and both models use them. The first form is comprised of a dependent variable (general health, mental health, physical health, drinking, or smoking), main explanatory variable (share of employment), and the supporting explanatory variables (Hispanic, Black, Asian, Pacific Islander, Native American, other race, did not graduate high school graduated high school, attended college or technical school, divorced, widowed, separated, never married, unmarried couple, self-employed, out of work for more than 1 year, out of work for less than 1 year, homemaker, student, and retired). The second form is made up of: the dependent variable, main explanatory variable (establishment per 1000); and the supporting explanatory variables (Hispanic, Black, Asian, Pacific Islander, Native American, other race, did not graduate high school graduated high school, attended college or technical school, divorced, widowed, separated, never married, unmarried couple, self-employed, out of work for more than 1 year, out

⁹ Logit model gives log-odds ratio, but the marginal effect of logit gives the increase or decrease in units which gives better insight to the figure.

of work for less than 1 year, homemaker, student, and retired). As mentioned previously, the logit model is used to investigate the relationship between drinking and smoking and casino expansions, while the Poisson model is used to investigate Casino expansions effect on health.

Below are explanations for Poisson model and logit model.

Poisson Model log-likelihood function:

$$\ln L = \sum_{i=1}^n [-\lambda_i + y_i x_i' \beta - \ln y_i!]$$

Where λ_i the log linear model $\ln \lambda_i = x_i' \beta$

The likelihood function is: $\frac{\partial \ln L}{\partial \beta} = \sum_{i=1}^n (y_i - \lambda_i) x_i = 0$

The Hessian is:

$$\frac{\partial^2 \ln L}{\partial \beta \partial \beta'} = - \sum_{i=1}^n \lambda_i x_i x_i'$$

Y represents the dependent variable, general health, mental health, and physical health, and x represents the independent variables mentioned above.

Logit model log-likelihood function:

$$L_i = \prod_{i=1}^n [F(x\beta)]^{(y_i)} [1 - F(x\beta)]^{y_i}$$

Where $F(x\beta) = \frac{e^{x\beta}}{1+e^{x\beta}}$

The likelihood function is: $\frac{\partial \ln(L)}{\partial \beta} = \sum_{i=1}^N (y_i - F(x_i\beta)) x_i$

The Hessian is:

$$\frac{\partial^2 \ln(L)}{\partial \beta^2} = - \sum_{i=1}^n F(x_i \beta) (1 - F(x_i \beta)) x_i^2$$

Y represents the dependent variable drinking or smoking in Logit models. The x's represent the independent variables mentioned above and μ is the error term.

Results

The results are shown in 8 tables with 20 regressions. Tables 1, 2, 5 and 6 use general, physical, or mental health as the dependent variables, with gender, age, race, marital status, education, and employment status as independent variables. Tables 3, 4, 7 and 8 use drinking and smoking as the outcome, and gender, age, race education, employment status, and marital status as explanatory variables. All tables show marginal effects. Note that for the general¹⁰, mental, and physical health variables, an increase indicate in the value of the x worsening health. When interpreting education, all other education levels are compared to those who graduated college or technical school. As for employment, other employment statuses are compared to employ for wage. Dummy variables for ethnic categories are compared with non-Hispanic Whites. All other marital statuses are compared to those who are married.

Results from this research indicate that in general, an increase in casino employment or in the number of casinos causes a decline in mental and physical health, and increases the risk of binge drinking. In table 1, coefficients on the casino share of employment are statistically significant. A 1 percentage point increase in shares of employment decreases general health by

¹⁰ In this study, when looking at coefficients with general health as dependant variable, negative coefficients are interpreted as increase in health by x units, and positive coefficients are interpreted as decrease by x units.

0.615 units, increases the number of days on which mental health was not well by 7 days, and increase the number of days physical health was not well by 8 days. Results from table 2 shows for every 1000 additional establishments, general health increases by 1.875 units, the days mental health is not well increases by 8 days. The establishment coefficient is insignificant for physical health. Tables 3 and 4 are regressions of at risk binge drinking and current smoking. Regressions from table 3 show that a 1 percentage point increase in casino establishment increases the risk of binge drinking by 0.0992 units, and increases chance of being a current smoker by 0.331 units. Table 4 shows for every 1000 additional establishments risk of binge drinking increases by 0.413 units, though the establishment coefficient for smoking is statistically insignificant.

Findings in this report show in general, the casino hotel industry increase chance of smoking, being at risk of binge drinking, and cause a decline in mental health. Table 5 shows a 1 percentage point increase in casino hotel shares of employment, an increase by 1 day that mental health is labeled not well, and a half a day increase in poor physical health. However, it should be noted that casino hotel share of employment coefficient is insignificant for general health. Regressions from table 6 indicate that for every 1000 increase in establishments, general health rises by 0.168 units, the days mental health is “not well” increases by 3 days, but the establishment per 1000 coefficient is statistically insignificant for physical health. Table 7 and 8 show the effect of casino hotel industry share of employment on health behavior. Table 7 shows a 1 percentage point increase in casino hotel share of employment, an increase in risk binge drinking by 0.0647 units, and an increase in being a smoker by 0.104 units. Table 8 reveals an additional 1000 establishments increase the risk of binge drinking by 0.153 units, and being a smoker by 0.277 units.

Supporting explanatory variables include gender, race, employment status, marital status, age and age-squared. A decrease in general health is associated with increases in age, being Hispanic, Black, Asian, Pacific Islander, Native American, or other race in comparison to White race, did not graduate high school, graduated high school, attended college or technical school compared to graduated college or technical school, are divorced, widowed, separated, have never married, or remained an unmarried couple compared to those who are married, have been out of work for more than 1 year, or have been out of work for less than 1 year compared to those who work for wage. On the other hand, an increase in general health is related to being female, increases with old age, those self-employed, homemaker, student, or retired compared to those who work for wage.

In general, a decrease in mental health is associated with increases in age, being female, is more likely for someone being Native American, other race compared to White, those who did not graduate high school, graduated high school, or attended college or technical school compared to college or technical school graduates, are divorced, widowed, separated, have never married, or remained an unmarried couple compared to married, unemployed for a year or more, have been out of work for less than a year, student compared to those employed for wage. Meanwhile, an increase in mental health is affiliated with increase in old age, being Hispanic, Black, Asian, Pacific Islander compared to White, self-employed, homemaker, retired compared to employ for wage.

Largely speaking, a decrease in physical health is associated with being female, increases with age, being Native American, other race compared with White, did not graduate high school, graduated high school, attended college or technical school compared to graduated college or

technical school, are divorced, widowed, separated, never married, unmarried couple compared to married, have been out of work for more than 1 year compared to those employed for wage. An increase in physical health is linked with increase in old age, being Black, Asian, Pacific Islander compared to White, those self-employed, homemaker, or retired compared to individuals employed for wage.

At risk binge drinking is linked with increases in age, those graduated high school, attended college or technical school to graduated college or technical school, are divorced, widowed, separated, have never been married, unmarried couple compared to married, self-employed, retired compared to employed for wage. Decrease in binge drinking is connected with increases with old age, being Hispanic, Black, Asian, Pacific Islander, Native American, other race compared to White, those who did not graduate high school compared to graduated college or technical school, those unemployed for more than a year, homemaker, student as opposed to employed for wage.

The risk of being a smoker increases with age, being Native American, other race compared to White, those who have not graduated high school, graduated high school, had attended college or technical school compared to those graduated college or technical school, are divorced, widowed, separated, have never been married, unmarried couple compared to married, those unemployed for more than a year, or have been unemployed for less than a year in comparison to employed for wages. Non-smokers are more likely to be female, Hispanic, Black, Asian, Pacific Islander as opposed to White, self-employed, homemaker, and student compared to those employed for wage. Also, according to the data, as an individual becomes very old, he or she is more likely to be a nonsmoker.

Discussion

The results of this study generally confirm findings from previous studies for certain outcomes. This study strongly supports previous findings: with gambling expansions, mental health decreases, and at risk binge drinking increases. Estimation for general health, physical health, and smoking may be weaker in comparison to mental health and drinking. The Establishment per 1000 coefficient on general health from both industries are inconsistent with the casino share of employment coefficient on general health from the casino industry. Physical health on all industry's gambling employment results are consistent, and statistically significant, but insignificant with gambling establishment expansions. Smoking results are consistent, and only statistically insignificant from casino industry's establishment per 1000 coefficient. The establishment variable compared to shares of employment seems to be weaker and has less of an effect on health and health behavior. With the exception of smoking, the casino hotel industry in comparison to the casino industry, in general, has a weaker effect on health and health behavior.

The current study is limited in that it only looks at the effect of gambling expansion on locals. Data in this study does not address the following: 1) how much casino or hotel casinos employees are being affected by the industry expansion; 2) how much gambler's family members are affected; 3) the effect of the duration of the gambling expansion on individuals' health. If the survey were longitudinal, and if it asked industry of employment, and if family have someone close being an addictive gambler, the three limitations would no longer be an issue.

Conclusion

Overall, this study does indicate that gambling expansion causes a decline health and increases risky health behaviors, with the exception of general health. In general, gambling expansion

increases risky health behavior and decreases mental health. General health increases with establishment expansions but decrease with employment expansion of casino industry. Physical health decreases with employment expansion. Further study is required to examine why findings from general health are inconsistent.

Table A Casino Industry Summary Statistics (Table 1 to 4)

Variable	Observations	Mean	Std. Dev.	Min	Max
General Health	3491965	2.54	1.10	1	5.00
Mental Health	3447130	3.43	7.73	0	30.00
Physical Health	3434307	4.23	8.74	0	30.00
Smoking	3505930	0.18	0.38	0	1.00
Drinking	3505930	0.11	0.32	0	1.00
Establishment per 1000	3505930	0.00	0.00	0	0.06
Share of Employment	3484409	0.00	0.01	0	0.26
Female	3505930	0.62	0.49	0	1.00
Age	3474869	53.98	17.08	18	99.00
Age-Squared	3474869	3205.88	1865.56	324	9801.00
Hispanic	3505930	0.06	0.24	0	1.00
Black	3466919	0.08	0.28	0	1.00
Asian	3466919	0.02	0.13	0	1.00
Pacific Islanders	3466919	0.00	0.05	0	1.00
Native American	3466919	0.01	0.11	0	1.00
Other	3466919	0.01	0.08	0	1.00
White	3466919	0.80	0.40	0	1.00
Did not Graduate High School	3505930	0.09	0.29	0	1.00
Graduated High School	3505930	0.29	0.46	0	1.00
Attended College or Technical School	3505930	0.27	0.44	0	1.00
Graduated College or Technical School	3505930	0.34	0.48	0	1.00
Divorced	3505930	0.14	0.35	0	1.00
Widowed	3505930	0.13	0.34	0	1.00
Separated	3505930	0.02	0.15	0	1.00
Never Married	3505930	0.13	0.34	0	1.00
Unmarried Couple	3505930	0.02	0.15	0	1.00
Married	3505930	0.55	0.50	0	1.00
Self-Employed	3505930	0.08	0.28	0	1.00
Out of Work for more than 1 Year	3505930	0.02	0.15	0	1.00
Out of Work for less than 1 Year	3505930	0.03	0.16	0	1.00
Homemaker	3505930	0.07	0.26	0	1.00
Student	3505930	0.02	0.14	0	1.00
Retired	3505930	0.26	0.44	0	1.00
Employed for Wage	3505930	0.44	0.50	0	1.00

Table B Casino Hotel Industry Summary Statistics (Table 5 to 8)

Variable	Observations	Mean	Std. Dev.	Min	Max
General Health	3491965	2.54	1.10	1	5.00
Mental Health	3447130	3.43	7.73	0	30.00
Physical Health	3434307	4.23	8.74	0	30.00
Smoking	3505930	0.18	0.38	0	1.00
Drinking	3505930	0.11	0.32	0	1.00
Establishment per 1000	3505930	0.00	0.01	0	0.11
Share of Employment	3491716	0.00	0.02	0	0.35
Female	3505930	0.62	0.49	0	1.00
Age	3474869	53.98	17.08	18	99.00
Age-Squared	3474869	3205.88	1865.56	324	9801.00
Hispanic	3505930	0.06	0.24	0	1.00
Black	3466919	0.08	0.28	0	1.00
Asian	3466919	0.02	0.13	0	1.00
Pacific Islanders	3466919	0.00	0.05	0	1.00
Native American	3466919	0.01	0.11	0	1.00
Other	3466919	0.01	0.08	0	1.00
White	3466919	0.80	0.40	0	1.00
Did not Graduate High School	3505930	0.09	0.29	0	1.00
Graduated High School	3505930	0.29	0.46	0	1.00
Attended College or Technical School	3505930	0.27	0.44	0	1.00
Graduated College or Technical School	3505930	0.34	0.48	0	1.00
Divorced	3505930	0.14	0.35	0	1.00
Widowed	3505930	0.13	0.34	0	1.00
Separated	3505930	0.02	0.15	0	1.00
Never Married	3505930	0.13	0.34	0	1.00
Unmarried Couple	3505930	0.02	0.15	0	1.00
Married	3505930	0.55	0.50	0	1.00
Self-Employed	3505930	0.08	0.28	0	1.00
Out of Work for more than 1 year	3505930	0.02	0.15	0	1.00
Out of Work for less than 1 year	3505930	0.03	0.16	0	1.00
Homemaker	3505930	0.07	0.26	0	1.00
Student	3505930	0.02	0.14	0	1.00
Retired	3505930	0.26	0.44	0	1.00
Employed for Wage	3505930	0.44	0.50	0	1.00

Table 1 Employee/Total Employed and Health of Casino Industry

	(1) General Health	(2) Mental Health	(3) Physical Health
Employee/Total Employee	0.615*** (0.109)	6.514*** (0.748)	8.221*** (0.847)
Female	-0.0386*** (0.00119)	1.065*** (0.00943)	0.429*** (0.0103)
Age	0.0255*** (0.000209)	0.145*** (0.00176)	0.223*** (0.00189)
Age-Squared	-0.000106*** (0.00000195)	-0.00174*** (0.0000181)	-0.00132*** (0.0000171)
Hispanic	0.243*** (0.00223)	-0.584*** (0.0171)	-0.00349 (0.0195)
Black	0.201*** (0.00193)	-0.434*** (0.0146)	-0.0901*** (0.0165)
Asian	0.130*** (0.00422)	-1.396*** (0.0395)	-1.345*** (0.0469)
Pacific Islanders	0.140*** (0.0128)	-0.234*** (0.0891)	0.0104 (0.111)
Native American	0.279*** (0.00482)	0.509*** (0.0309)	1.206*** (0.0346)
Other	0.143*** (0.00733)	0.601*** (0.0487)	0.698*** (0.0564)
Did not Graduate High School	0.897*** (0.00199)	2.704*** (0.0154)	3.812*** (0.0166)
Graduated High School	0.539*** (0.00145)	1.518*** (0.0114)	2.156*** (0.0132)
Attended College or Technical School	0.366*** (0.00151)	1.306*** (0.0113)	1.769*** (0.0135)

Divorced	0.210*** (0.00170)	1.718*** (0.0116)	1.553*** (0.0131)
Widowed	0.117*** (0.00194)	1.402*** (0.0171)	0.713*** (0.0157)
Separated	0.337*** (0.00364)	2.537*** (0.0202)	2.177*** (0.0256)
Never Married	0.201*** (0.00189)	1.211*** (0.0133)	1.164*** (0.0164)
Unmarried Couple	0.176*** (0.00366)	1.256*** (0.0230)	1.026*** (0.0320)
Self-Employed	-0.300*** (0.00223)	-0.900*** (0.0172)	-2.104*** (0.0222)
Out of Work for More Than 1 Year	0.234*** (0.00351)	1.549*** (0.0194)	1.307*** (0.0249)
Out of Work for Less Than 1 Year	0.0701*** (0.00341)	1.107*** (0.0196)	0.180*** (0.0289)
A Homemaker	-0.0775*** (0.00226)	-0.474*** (0.0171)	-0.789*** (0.0197)
A Student	-0.0628*** (0.00439)	0.180*** (0.0259)	-0.0298 (0.0398)
Retired	-0.0475*** (0.00179)	-0.944*** (0.0161)	-0.743*** (0.0144)
Observations	3406101	3364086	3351513

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 2 Establishments and Health of Casino Industry

	(1) General Health	(2) Mental Health	(3) Physical Health
Establishment/1000	-1.875*** (0.181)	7.589*** (1.178)	1.033 (1.472)
Female	-0.0387*** (0.00119)	1.066*** (0.00940)	0.429*** (0.0103)
Age	0.0255*** (0.000208)	0.145*** (0.00176)	0.223*** (0.00188)
Age-Squared	-0.000106*** (0.00000194)	-0.00174*** (0.0000180)	-0.00132*** (0.0000171)
Hispanic	0.244*** (0.00222)	-0.582*** (0.0171)	0.00379 (0.0194)
Black	0.201*** (0.00193)	-0.432*** (0.0146)	-0.0909*** (0.0164)
Asian	0.131*** (0.00419)	-1.397*** (0.0392)	-1.354*** (0.0466)
Pacific Islanders	0.143*** (0.0127)	-0.246*** (0.0885)	0.0257 (0.110)
Native American	0.278*** (0.00476)	0.491*** (0.0306)	1.193*** (0.0343)
Other	0.143*** (0.00730)	0.592*** (0.0485)	0.702*** (0.0561)
Did not graduate high school	0.896*** (0.00198)	2.700*** (0.0154)	3.805*** (0.0165)
Graduated High School	0.539*** (0.00145)	1.516*** (0.0113)	2.152*** (0.0131)
Attended College or Technical School	0.366*** (0.00150)	1.305*** (0.0113)	1.767*** (0.0134)
Divorced	0.210***	1.717***	1.554***

	(0.00170)	(0.0116)	(0.0130)
Widowed	0.117*** (0.00193)	1.401*** (0.0171)	0.712*** (0.0157)
Separated	0.337*** (0.00363)	2.535*** (0.0202)	2.174*** (0.0256)
Never Married	0.201*** (0.00188)	1.210*** (0.0133)	1.164*** (0.0164)
Unmarried Couple	0.177*** (0.00364)	1.253*** (0.0229)	1.028*** (0.0319)
Self-Employed	-0.299*** (0.00222)	-0.900*** (0.0172)	-2.102*** (0.0221)
Out of work for more than 1 year	0.235*** (0.00350)	1.550*** (0.0193)	1.308*** (0.0248)
Out of work for less than 1 year	0.0703*** (0.00339)	1.104*** (0.0196)	0.174*** (0.0288)
A Homemaker	-0.0768*** (0.00225)	-0.474*** (0.0170)	-0.786*** (0.0196)
A Student	-0.0627*** (0.00437)	0.185*** (0.0258)	-0.0259 (0.0396)
Retired	-0.0472*** (0.00179)	-0.944*** (0.0161)	-0.742*** (0.0144)
Observations	3427031	3384767	3372188

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3 Employee/Total Employed on Drinking and Smoking of Casino Industry

	(1) Drinking	(2) Smoking
Employee/Total Employee	0.0992*** (0.0317)	0.331*** (0.0372)
Female	-0.0832*** (0.000345)	-0.0244*** (0.000417)
Age	0.00249*** (0.0000754)	0.0120*** (0.0000838)
Age-Squared	-0.0000699*** (0.000000828)	-0.000156*** (0.000000858)
Hispanic	-0.0264*** (0.000676)	-0.0989*** (0.000899)
Black	-0.0571*** (0.000694)	-0.0376*** (0.000705)
Asian	-0.0719*** (0.00146)	-0.0803*** (0.00193)
Pacific Islanders	-0.0140*** (0.00323)	-0.0167*** (0.00413)
Native American	-0.0139*** (0.00139)	0.0396*** (0.00149)
Other	-0.0324*** (0.00216)	0.00444* (0.00243)
Did not Graduate High School	-0.0113*** (0.000710)	0.216*** (0.000722)
Graduated High School	0.00558*** (0.000422)	0.157*** (0.000534)
Attended College or Technical School	0.00713*** (0.000418)	0.118*** (0.000555)

Divorced	0.0305*** (0.000488)	0.114*** (0.000535)
Widowed	0.0124*** (0.000893)	0.0886*** (0.000790)
Separated	0.0243*** (0.00107)	0.115*** (0.00111)
Never Married	0.0278*** (0.000473)	0.0722*** (0.000620)
Unmarried couple	0.0455*** (0.000849)	0.109*** (0.00108)
Self-Employed	0.00900*** (0.000550)	-0.0186*** (0.000741)
Out of Work for More Than 1 Year	-0.00993*** (0.00106)	0.0626*** (0.00107)
Out of Work for Less Than 1 Year	0.00693*** (0.000880)	0.0559*** (0.00101)
A Homemaker	-0.0402*** (0.000877)	-0.0209*** (0.000846)
A Student	-0.0164*** (0.00100)	-0.0491*** (0.00147)
Retired	0.00861*** (0.000715)	0.00132* (0.000732)
Observations	3419195	3419195

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4 Establishments on Drinking and Smoking of Casino Industry

	(1) Drinking	(2) Smoking
Establishment/1000	0.413*** (0.0462)	-0.104 (0.0637)
Female	-0.0832*** (0.000344)	-0.0244*** (0.000416)
Age	0.00249*** (0.0000752)	0.0120*** (0.0000835)
Age-Squared	-0.0000699*** (0.000000826)	-0.000155*** (0.000000855)
Hispanic	-0.0267*** (0.000674)	-0.0987*** (0.000896)
Black	-0.0571*** (0.000694)	-0.0376*** (0.000704)
Asian	-0.0722*** (0.00145)	-0.0803*** (0.00192)
Pacific Islanders	-0.0142*** (0.00321)	-0.0172*** (0.00411)
Native American	-0.0131*** (0.00137)	0.0406*** (0.00147)
Other	-0.0323*** (0.00215)	0.00456* (0.00242)
Did not Graduate High School	-0.0112*** (0.000708)	0.216*** (0.000720)
Graduated High School	0.00568*** (0.000421)	0.157*** (0.000532)
Attended College or Technical School	0.00724*** (0.000416)	0.118*** (0.000553)
Divorced	0.0305***	0.114***

	(0.000487)	(0.000533)
Widowed	0.0123*** (0.000891)	0.0886*** (0.000787)
Separated	0.0242*** (0.00106)	0.115*** (0.00111)
Never Married	0.0278*** (0.000472)	0.0722*** (0.000618)
Unmarried Couple	0.0455*** (0.000846)	0.109*** (0.00107)
Self-Employed	0.00899*** (0.000548)	-0.0186*** (0.000738)
Out of work for more than 1 year	-0.0101*** (0.00105)	0.0626*** (0.00107)
Out of work for less than 1 year	0.00691*** (0.000877)	0.0558*** (0.00100)
A Homemaker	-0.0401*** (0.000874)	-0.0210*** (0.000843)
A Student	-0.0164*** (0.000998)	-0.0490*** (0.00147)
Retired	0.00865*** (0.000713)	0.00129* (0.000730)
Observations	3440182	3440182

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5 Employee/Total Employed and Health of Casino Hotel Industry

	(1) General Health	(2) Mental Health	(3) Physical Health
Employee/Total Employee	0.0185 (0.0263)	0.954*** (0.185)	0.530** (0.215)
Female	-0.0386*** (0.00119)	1.065*** (0.00942)	0.429*** (0.0103)
Age	0.0255*** (0.000209)	0.145*** (0.00176)	0.223*** (0.00189)
Age-Squared	-0.000106*** (0.00000195)	-0.00174*** (0.0000180)	-0.00132*** (0.0000171)
Hispanic	0.243*** (0.00222)	-0.579*** (0.0171)	0.00269 (0.0194)
Black	0.201*** (0.00193)	-0.434*** (0.0146)	-0.0914*** (0.0165)
Asian	0.130*** (0.00421)	-1.395*** (0.0394)	-1.347*** (0.0468)
Pacific Islanders	0.142*** (0.0128)	-0.237*** (0.0890)	0.0148 (0.111)
Native American	0.280*** (0.00481)	0.523*** (0.0308)	1.221*** (0.0345)
Other	0.143*** (0.00732)	0.598*** (0.0486)	0.697*** (0.0564)
Did not Graduate High School	0.897*** (0.00199)	2.700*** (0.0154)	3.809*** (0.0166)
Graduated High School	0.539*** (0.00145)	1.516*** (0.0114)	2.155*** (0.0132)
Attended College or Technical School	0.366*** (0.00151)	1.306*** (0.0113)	1.769*** (0.0135)

Divorced	0.210*** (0.00170)	1.718*** (0.0116)	1.554*** (0.0130)
Widowed	0.117*** (0.00194)	1.401*** (0.0171)	0.713*** (0.0157)
Separated	0.337*** (0.00364)	2.535*** (0.0202)	2.177*** (0.0256)
Never Married	0.201*** (0.00189)	1.211*** (0.0133)	1.163*** (0.0164)
Unmarried Couple	0.176*** (0.00366)	1.254*** (0.0230)	1.027*** (0.0320)
Self-Employed	-0.299*** (0.00223)	-0.899*** (0.0172)	-2.103*** (0.0222)
Out of Work for More Than 1 Year	0.235*** (0.00351)	1.550*** (0.0193)	1.308*** (0.0249)
Out of Work for Less Than 1 Year	0.0703*** (0.00340)	1.106*** (0.0196)	0.177*** (0.0288)
A Homemaker	-0.0770*** (0.00226)	-0.474*** (0.0170)	-0.787*** (0.0197)
A Student	-0.0626*** (0.00438)	0.183*** (0.0258)	-0.0290 (0.0397)
Retired	-0.0473*** (0.00179)	-0.943*** (0.0161)	-0.741*** (0.0144)
Observations	3413283	3371227	3358622

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6 Establishments and Health of Casino Hotel Industry

	(1) General Health	(2) Mental Health	(3) Physical Health
Establishment/1000	-0.168* (0.0863)	3.048*** (0.569)	0.596 (0.704)
Female	-0.0386*** (0.00119)	1.066*** (0.00940)	0.429*** (0.0103)
Age	0.0255*** (0.000208)	0.145*** (0.00176)	0.223*** (0.00188)
Age-Squared	-0.000106*** (0.00000194)	-0.00174*** (0.0000180)	-0.00132*** (0.0000171)
Hispanic	0.243*** (0.00221)	-0.580*** (0.0170)	0.00404 (0.0194)
Black	0.201*** (0.00193)	-0.433*** (0.0146)	-0.0910*** (0.0164)
Asian	0.131*** (0.00419)	-1.395*** (0.0392)	-1.354*** (0.0466)
Pacific Islanders	0.142*** (0.0127)	-0.243*** (0.0885)	0.0258 (0.110)
Native American	0.278*** (0.00476)	0.492*** (0.0306)	1.193*** (0.0343)
Other	0.143*** (0.00730)	0.591*** (0.0485)	0.702*** (0.0561)
Did not Graduate High School	0.896*** (0.00198)	2.698*** (0.0154)	3.805*** (0.0165)
Graduated High School	0.539*** (0.00144)	1.515*** (0.0113)	2.152*** (0.0131)
Attended College or Technical School	0.366*** (0.00151)	1.305*** (0.0113)	1.767*** (0.0134)
Divorced	0.210***	1.718***	1.554***

	(0.00170)	(0.0116)	(0.0130)
Widowed	0.117*** (0.00193)	1.401*** (0.0171)	0.712*** (0.0157)
Separated	0.337*** (0.00363)	2.535*** (0.0202)	2.174*** (0.0256)
Never Married	0.201*** (0.00188)	1.210*** (0.0133)	1.164*** (0.0164)
Unmarried Couple	0.176*** (0.00364)	1.254*** (0.0229)	1.028*** (0.0319)
Self-Employed	-0.299*** (0.00222)	-0.899*** (0.0172)	-2.102*** (0.0221)
Out of work for more than 1 year	0.235*** (0.00350)	1.551*** (0.0193)	1.308*** (0.0248)
Out of work for less than 1 year	0.0701*** (0.00339)	1.105*** (0.0196)	0.174*** (0.0288)
A Homemaker	-0.0769*** (0.00225)	-0.474*** (0.0170)	-0.786*** (0.0196)
A Student	-0.0627*** (0.00437)	0.185*** (0.0258)	-0.0259 (0.0396)
Retired	-0.0474*** (0.00179)	-0.944*** (0.0161)	-0.742*** (0.0144)
Observations	3427031	3384767	3372188

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7 Employee/Total Employed on Drinking and Smoking of Casino Hotel Industry

	(1) Drinking	(2) Smoking
Employee/Total Employee	0.0647*** (0.00720)	0.104*** (0.00879)
Female	-0.0832*** (0.000344)	-0.0243*** (0.000416)
Age	0.00249*** (0.0000753)	0.0120*** (0.0000837)
Age-Squared	-0.0000698*** (0.000000827)	-0.000156*** (0.000000857)
Hispanic	-0.0265*** (0.000675)	-0.0989*** (0.000897)
Black	-0.0570*** (0.000694)	-0.0376*** (0.000705)
Asian	-0.0722*** (0.00146)	-0.0805*** (0.00192)
Pacific Islanders	-0.0140*** (0.00323)	-0.0169*** (0.00413)
Native American	-0.0137*** (0.00139)	0.0401*** (0.00149)
Other	-0.0326*** (0.00216)	0.00424* (0.00243)
Did not Graduate High School	-0.0113*** (0.000709)	0.216*** (0.000721)
Graduated High School	0.00554*** (0.000422)	0.157*** (0.000533)
Attended College or Technical School	0.00710*** (0.000417)	0.118*** (0.000554)

Divorced	0.0305*** (0.000487)	0.114*** (0.000534)
Widowed	0.0124*** (0.000892)	0.0886*** (0.000789)
Separated	0.0242*** (0.00107)	0.115*** (0.00111)
Never Married	0.0278*** (0.000473)	0.0721*** (0.000619)
Unmarried Couple	0.0455*** (0.000848)	0.108*** (0.00107)
Self-Employed	0.00905*** (0.000549)	-0.0186*** (0.000740)
Out of Work for More Than 1 Year	-0.00993*** (0.00106)	0.0625*** (0.00107)
Out of Work for Less Than 1 Year	0.00689*** (0.000879)	0.0559*** (0.00101)
A Homemaker	-0.0401*** (0.000876)	-0.0209*** (0.000845)
A Student	-0.0164*** (0.001000)	-0.0489*** (0.00147)
Retired	0.00862*** (0.000714)	0.00131* (0.000731)
Observations	3426390	3426390

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8 Establishments on Drinking and Smoking of Casino Hotel Industry

	(1) Drinking	(2) Smoking
Establishment/1000	0.153*** (0.0226)	0.277*** (0.0281)
Female	-0.0832*** (0.000344)	-0.0243*** (0.000416)
Age	0.00249*** (0.0000752)	0.0120*** (0.0000835)
Age-Squared	-0.0000699*** (0.000000826)	-0.000155*** (0.000000855)
Hispanic	-0.0266*** (0.000673)	-0.0990*** (0.000895)
Black	-0.0571*** (0.000694)	-0.0376*** (0.000704)
Asian	-0.0721*** (0.00145)	-0.0805*** (0.00192)
Pacific Islanders	-0.0139*** (0.00321)	-0.0177*** (0.00411)
Native American	-0.0131*** (0.00137)	0.0406*** (0.00147)
Other	-0.0323*** (0.00215)	0.00430* (0.00242)
Did not Graduate High School	-0.0112*** (0.000708)	0.216*** (0.000719)
Graduated High School	0.00561*** (0.000421)	0.157*** (0.000532)
Attended College or Technical School	0.00722*** (0.000416)	0.118*** (0.000553)
Divorced	0.0305***	0.114***

	(0.000487)	(0.000533)
Widowed	0.0123*** (0.000891)	0.0886*** (0.000787)
Separated	0.0242*** (0.00106)	0.115*** (0.00111)
Never Married	0.0278*** (0.000472)	0.0721*** (0.000618)
Unmarried Couple	0.0455*** (0.000846)	0.109*** (0.00107)
Self-Employed	0.00901*** (0.000548)	-0.0186*** (0.000738)
Out of work for more than 1 year	-0.0101*** (0.00105)	0.0625*** (0.00107)
Out of work for less than 1 year	0.00694*** (0.000877)	0.0557*** (0.00100)
A Homemaker	-0.0401*** (0.000874)	-0.0210*** (0.000843)
A Student	-0.0164*** (0.000998)	-0.0490*** (0.00147)
Retired	0.00866*** (0.000713)	0.00126* (0.000730)
Observations	3440182	3440182

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

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