ALCOHOL OUTLET DENSITIES, CRIME, AND POPULATION RESTRICTIONS ON ALCOHOL LICENSES

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ABSTRACT

The purpose of this paper is to estimate the effects of the per capita number of on-premise and off-premise alcohol outlets on the rates of violent, non-violent, and total crime throughout 506 New Jersey municipalities, holding constant socio-demographic predictors of crime. The socio-demographic correlates to violent and non-violent crime were obtained from the 2000 Decennial Census. The alcohol outlet data were obtained from the New Jersey Division of Alcoholic Beverage Control, and violent, non-violent, and total crime data were obtained using the Uniform Crime Reports from the New Jersey State Police. Multiple regression results indicate an on-premise outlet effect; that is, the per capita number of bars, taverns, and restaurants with alcohol licenses are statistically significant predictors of violent and non-violent crime -- with the effect being more robust for non-violent crime. Off-premise licenses (e.g., liquor stores) were not statistically important. New Jersey's population restrictions have limited potential to reduce crime associated with on-premise alcohol availability -- yet such restrictions may contribute to reducing crime associated with the availability of alcohol for off-premise consumption.

Keywords: municipal retail alcoholic beverage licenses, population restrictions, violent and non-violent crime

INTRODUCTION

Adopted in 1933, the 21st Amendment ended the federal government's prohibition on the manufacture or sale of alcoholic beverages in the United States. Regulating

the consumption of alcoholic beverages thus returned to state governments. All states ultimately imposed regulations on the sale of alcoholic beverages in order to limit consumption or to raise revenues. These regulations included minimum drinking ages, hours of operation for the sale of alcoholic beverages for on-premise (e.g., taverns, bars, restaurants) and off-premise consumption, advertising restrictions, and the taxation of beer, wine, and spirits.

Most states adopted licensing systems that permitted the sale of alcoholic beverages from privately owned outlets. By 1936, however, fifteen states had created state monopolies for the sale of distilled spirits at the wholesale and/or retail level, in the latter case usually for off-premise consumption (Sloan et al. 2000). The New Jersey state legislature chose the licensing route, although its regulations have evolved over time to distinguish it from other states. In 1947, the New Jersey state legislature imposed population restrictions on the number of on-premise and off-premise alcoholic beverage consumption licenses that could be issued within a given municipality. The legislation further permitted the transfer of licenses at market value from one party to another within the municipality. In 1981, the legislature allowed all newly issued on-premise and off-premise alcoholic beverage consumption licenses to be auctioned by the municipality. The current New Jersey system of population restrictions on alcoholic beverage outlets can be summarized as: 1) Municipalities may issue one retail alcoholic beverage license for on-premise consumption per 3,000 in population. 2) Municipalities may issue one retail alcoholic beverage license for off-premise consumption per 7,500 in population. 3) All on-premise and off-premise license holders are permitted to sell beer, wine, and spirits. 4) New Jersey does not issue special licenses that allow on-premise and off-premise establishments to sell beer only or beer and wine only. For example, some states permit

grocery and drug stores to sell beer only or beer and wine for off-premise consumption. New Jersey's licensing system makes no such allowances. 5) Existing license holders can sell them at market value for use within the municipality; that is, licenses are considered real property. 6) Municipalities have the option to auction new licenses for the sale of alcoholic beverages only when they become population eligible. When population restrictions where first imposed, existing licenses where grandfathered. In some cases, municipalities have license numbers beyond the population formulas, and therefore population growth in these municipalities does not necessarily result in license eligibility.

In addition to New Jersey, 25 other states currently use population formulas to restrict the number of retail alcoholic beverage consumption licenses. Nineteen of these states use population formulas to restrict both on-premise and off-premise alcohol outlets (Author's survey 2006). A primary goal of state population restrictions on the number of licenses is to reduce the negative externalities associated with alcoholic beverage consumption or with the retail outlets themselves. Such externalities may include traffic accidents, noise, loitering, and crime (Zhu, Gorman, and Horel 2004; Gruenewald, Johnson, and Treno 2002; Cohen et al. 2002). The possible link between alcohol outlets and crime is compelling as a research basis given the broader societal and quality of life implications.

This paper examines the effectiveness of New Jersey's population restrictions in terms of limiting crime associated with alcohol availability. This research examines the following question: are alcohol outlet densities statistically important predictors of violent and non-violent crime throughout New Jersey municipalities? Given the stringency of New Jersey's alcoholic beverage licensing system, it is hypothesized that the on-premise and off-

premise outlet densities will not significantly explain municipal crime rates. The significance of this research lies in its policymaking applications dealing with the regulation of retail alcoholic beverage licenses.

CRIME, ALCOHOL OUTLETS, AND ALCOHOL LICENSE REGULATIONS

Previous studies are generally supportive of an outlet effect on violent crime rates. Zhu, Gorman, and Horel (2004) examined the impact of alcohol outlet densities on violent crime rates throughout San Antonio and Austin census tracts. In the context of their examination, violent crime included murder, rape, robbery, and assault. The authors found higher alcohol outlet densities to be associated with higher rates of violent crime. Gorman, Zhu, and Horel (2005) also found that off-premise outlet densities predicted higher rates of violent crime throughout Houston census tracts. Reid, Hughey, and Peterson (2003) examined alcohol outlet densities and rates of assaultive violence throughout Kansas City census tracts. Assaultive violence is defined as criminal homicide, forcible rape, aggravated assault, and robbery. Alcohol outlet densities were found to be statistically important determinants of assaultive violence. In these three studies, the authors controlled for several socio-economic and demographic correlates to crime, some of which include: poverty rate, unemployment rate, racial and/or ethnic composition, proportion of households headed by females, education level, and the proportion of vacant and owner occupied housing units.

The three aforementioned studies present empirical evidence supportive of an alcohol outlet effect on violent crime in both Texas and Missouri. These outlet effects may be explained, to some extent, by these states' laissez faire approach to retail alcoholic beverage licensing. Unlike New

Jersey, Texas and Missouri do not use population formulas to restrict the number of on-premise and off-premise retail consumption licenses. Furthermore, Texas permits the sale of beer and wine for off-premise consumption at grocery stores and drug stores, while Missouri permits grocery and drug stores to sell beer, wine, and spirits for off-premise consumption. New Jersey makes no such allowances (Author's survey 2006). In short, alcohol availability is greater in Texas and Missouri compared to New Jersey.

Scribner, MacKinnon, and Dwyer (1995) tested the link between alcohol availability and assaultive violence in 74 Los Angeles county municipalities. They found that alcohol outlets predicted higher rates of assaultive violence. Unlike Texas and Missouri, California imposes population restrictions alcohol licenses. California counties may issue one on-premise consumption license for every 2,000 people and one off-premise consumption license for every 2,500 people. Unlike New Jersey, however, California also issues special licenses that permit the sale of beer only and beer and wine (no distilled spirits) for on-premise and off-premise consumption.

Not all studies support the premise that higher alcohol outlet concentrations contribute to higher crime rates. In replicating Scribner, MacKinnon, and Dwyer's (1995) study, Gorman et al. (1998) did not find a statistically significant relationship between rates of assaultive violence and outlet densities throughout 223 New Jersey municipalities. Again, using New Jersey municipalities as the unit of analysis, Gorman et al. (1998a) found no evidence that alcohol outlets influenced rates of domestic violence. Previous studies examining the relationship between alcohol outlets and violent crime present somewhat mixed results -- although the preponderance of studies are supportive of an outlet effect on violent crime. Further, the literature has under-emphasized the potential link between alcohol outlets and

non-violent crime. This paper extends the current literature by examining alcohol outlet densities and their impact on both violent and non-violent municipal crime rates.

METHOD

The purpose of this study is to estimate the effects of the per capita number of on-premise and off-premise alcohol outlets on the rates of violent, non-violent, and total crime throughout 506 New Jersey municipalities. Several socio-demographic correlates to crime were obtained from the 2000 Decennial Census, using Summary Files 1 and 3 (American Fact Finder 2007). The alcohol outlet data were obtained from the New Jersey Division of Alcoholic Beverage Control (2005), which provides an address-specific list of the total number of on-premise and off-premise retail alcoholic beverage licenses throughout New Jersey's municipalities. Violent and non-violent crime data were obtained using the Uniform Crime Reports from the New Jersey State Police (2005). Violent crime includes murder, rape, robbery, and aggravated assault, while non-violent crime includes burglary, larceny, and motor vehicle theft. These three data sources were combined and matched according to municipality.

Per capita rates of violent, non-violent, and total crime are regressed on: the per capita number of on-premise retail alcoholic beverage licenses (e.g., bars, taverns, restaurants); the per capita number of off-premise retail alcohol beverage licenses (e.g., liquor stores); municipal population; median age; percent of the population that is black; percent of the population that is Hispanic; percent of households headed by females; percent of vacant housing units; percent of total housing units owner that are occupied; educational attainment; unemployment rate; and poverty rate. The empirical work discussed earlier helped determine which socio-

demographic variables were included in the crime models. Refer to Table 1 for variable definitions, means, and standard deviations.

Table 1
Definitions and Means (Standard Deviations) for Variables Used in Correlations and Multiple Regression Models

Variable	Definition	Mean (Standard Deviation)
Total crime	Number of non-violent and violent crimes per 1,000 population	22.60 (17.99)
Non-Violent crime	Number of burglaries, incidents of larceny, and motor vehicle thefts per 1,000 population	19.98 (15.80)
Violent crime	Number of murders, rapes, robberies, and aggravated assaults per 1,000 population	2.08 (3.14)
On-premise outlets	Number of on-premise retail alcoholic beverage outlets per 1,000 population (e.g., bars, taverns, restaurants)	.90 (.93)
Off-premise outlets	Number of off-premise retail alcoholic beverage outlets per 1,000 population (e.g., liquor stores)	.30 (.36)
Population	Municipality's 2005 population	16,752 (24,237)
Median age	Median age	38.55 (4.67)
Percent black	Percent of municipality's population that is black	7.15 (12.82)
Percent Hispanic	Percent of municipality's population that is Hispanic	7.52 (10.30)
Percent of female headed households	Percent of households female headed -- no husband present	10.24 (4.71)
Percent of vacant housing units	Percent of total housing units that are vacant	7.80 (13.50)
Percent of total housing units owner occupied	Percent of total housing units that are owner occupied units	73.53 (17.83)
Education	Percent of population 25 and older with at least a bachelors degree	20.00 (8.73)
Unemployment rate	Percent of population 16 and over in labor force that is unemployed	2.99 (2.11)
Poverty rate	Percent of families below poverty level	4.32 (4.40)

New Jersey municipalities were self-selected because the state has one of the more stringent alcoholic beverage licensing systems in the United States. State imposed population restrictions limit the number of on-premise and off-premise licenses that can be issued in each municipality. Such restrictions have succeeded in keeping the per capita number of on-premise and off-premise alcohol outlets low compared to the other states of the U.S. (Coate 2006). This may serve to limit crime associated with alcohol availability.

RESULTS

Bivariate Analysis

Bivariate correlations are presented in Table 2 to initially examine relationships among the variables. Based on the correlations, a number of observations can be made. Both the on-premise and off-premise outlet variables are positively correlated to violent and non-violent crime rates. The off-premise variable is more weakly correlated to violent (.10, $p < .05$) and non-violent (.18, $p < .05$) crime compared to the on-premise variable. The on-premise variable has a correlation of .26 ($p < .05$) with both the violent and non-violent municipal crime variables. Violent crime rates are most strongly correlated with the poverty rate (.65, $p < .05$), unemployment rate (.64, $p < .05$), and the percentage of female headed households within a municipality (.70, $p < .05$). Non-violent crime rates are also most strongly correlated with poverty, unemployment, and the proportion of female headed households -- although these correlations are weaker compared to violent crime. Moreover, the matrix in Table 2 shows an absence of high correlations among the independent variables (> .70), thereby suggesting that multicollinearity will not confound the multiple regression results presented in the next section.

TABLE 2
Correlations Among Socio-Demographic Variables,
Alcohol Outlets, and Municipal Crime Rates

* Significant at .05 level

	Total Crime														
Total Crime	1.0	Violent Crime													
Violent Crime	.77*	1.0	Non-Violent Crime												
Non-Violent Crime	.99*	.72*	1.0	On-premise outlets											
On-premise outlets	.27*	.26*	.26*	1.0	Off-premise outlets										
Off-premise outlets	.19*	.10*	.18*	.39*	1.0	Population									
Population	.14*	.17*	.13*	-.33*	-.37*	1.0	Median Age								
Median Age	-.25*	-.42*	-.22*	.01	.01	-.29*	1.0	Percent black							
Percent black	.40*	.55*	.37*	-.08	-.10*	.42*	-.58*	1.0	Percent Hispanic						
Percent Hispanic	.30*	.40*	.28*	.18*	.17*	.42*	-.52*	.57*	1.0	Female headed households					
Female headed households	.61*	.70*	.58*	.22*	.17*	.24*	-.54*	.59*	.59*	1.0	Vacant housing units				
Vacant housing units	.42*	.38*	.41*	.32*	.08	-.22*	-.09*	.10*	-.07	.23*	1.0	Housing units owner occupied			
Housing owner occupied	-.49*	-.53*	-.47*	-.30*	-.35*	-.18	.46*	-.44*	-.65*	-.66*	-.26*	1.0	Education		
Education	-.49*	-.59*	-.46	-.33*	-.11*	.03	.40*	-.35*	-.33*	-.70*	-.47*	.43*	1.0	Unemploy-ment rate	
Unemploy-ment rate	.54*	.64*	.51*	.24*	.15*	.19*	-.48*	.49*	.45*	.69*	.37*	-.52*	-.63*	1.0	Poverty rate
Poverty rate	.51*	.65*	.48*	.26*	.17*	.14*	-.45*	.48*	.50*	.69*	.44*	-.62*	-.66*	.65*	1.0

Multivariate Analysis

Multiple regression analyses presented in Table 3 estimate the effects of the per capita number of on-premise and off-premise alcohol outlets on the rates of violent, non-violent, and total crime. The outlet effects on the total municipal crime rate are investigated in regression model 1. For variables that are statistically significant at the .05 level, the per capita number of on-premise retail alcoholic beverage licenses, municipal population, percent of the population that is black, percent of households headed by females, the percent of vacant housing units, and the unemployment rate are positively related to the total crime rate (sum of violent and non-violent crime rates). As the per capita number of on-premise outlets increases, so does the total crime rate; that is, the results presented in model 1 suggest that more bars, taverns, and restaurants with alcoholic beverage licenses mean more crime. The on-premise outlet effect is fairly robust, as an additional on-premise outlet per 1,000 in population would increase the total number of crimes per 1,000 by 2.4. The unemployment rate and the proportion of female headed households are strong determinants of total crime -- although they are not as strong as the on-premise outlet variable. For comparative purposes, one percentage increases in the unemployment rate and the proportion of female headed households would increase the total number of crimes per 1,000 by 1.1 and 1.3, respectively.

The percent of owner occupied housing units and percent of the population that is Hispanic are negatively and significantly related to the total crime rate. The per capita number of off-premise outlets, median age, educational attainment, and the poverty rate are not statistically significant.

In regression model 2, the dependent variable is the non-violent crime rate. Again, the on-premise outlets densities, the percent of households headed by females, the

percent of vacant housing units, and the unemployment rate are statistically significant and positively related to the non-violent crime rate. The on-premise outlet effect is nearly as robust as in model 1. The on-premise coefficient of 2.2 suggests that one additional on-premise outlet per 1,000 residents would engender 2.2 additional non-violent crimes per 1,000 in population. In terms of comparison, one percentage increases in the municipal unemployment rate and the proportion of female headed households would increase the number of non-violent crimes per 1,000 by 1 and 1.2, respectively. The percent of owner occupied housing units is statistically significant and negatively related to non-violent crime rates. While in model 1 the race and ethnicity variables and municipal population were predictors of total municipal crime, they are not statistically important in explaining non-violent crime. The per capita number of off-premise outlets, median age, educational attainment, and the poverty rate are not statistically significant.

In regression model 3, we investigate the determinants of violent crime. In this model, there is still an on-premise outlet effect, although this effect is much less robust. The on-premise coefficient in model 3 is equal to .24, thereby suggesting that an additional bar, tavern, or restaurant with an alcoholic beverage license per 1,000 residents would increase the number of violent crimes per 1,000 by only .24. In addition to the per capita number of on-premise outlets, municipal population, percent of the population that is black, percent of households headed by females, the percent of vacant housing units, and the poverty rate are significant and positive predictors of municipal violent crime rates. Compared to the other predictor variables, the poverty variable is fairly robust in model 3, as a one percentage increase in the poverty rate would increase the number of violent crimes per 1,000 by .33. Percent Hispanic is the only negative predictor

significant at the .05 level. The off-premise outlet variable, median age, the percent of owner occupied housing units, education, and unemployment rate were not statistically important.

Table 3
Results of Regressing On-premise and Off-premise Alcohol Outlet Densities and Other Socio-Demographic Variables on the Total, Non-Violent, and Violent Crime Rates

	Model 1 Total Crime	Model 2 Non-Violent Crime	Model 3 Violent Crime
On-premise outlets	2.42 (3.46)**	2.18 (3.37)**	.24 (2.34)*
Off-premise outlets	-1.25 (-.71)	-1.62 (-1.00)	.37 (1.41)
Population	.00005 (1.97)*	.00004 (1.76)	8.82e-06 (2.32)*
Median age	.02 (.12)	.04 (.28)	-.02 (-.94)
Percent black	.14 (2.16)*	.09 (1.47)	.05 (5.41)**
Percent Hispanic	-.16 (-2.13)*	-.13 (-1.88)	-.03 (-2.60)**
Percent of female headed households	1.32 (4.65)**	1.18 (4.47)**	.15 (3.45)**
Percent of vacant housing units	.60 (10.96)**	.58 (11.38)**	.02 (2.90)**
Percent of owner occupied units	-.09 (-2.04)*	-.10 (-2.28)*	.003 (.49)
Education	.05 (.57)	.03 (.35)	.02 (1.68)
Unemployment rate	1.11 (3.56)**	1.03 (3.57)**	.08 (1.72)
Poverty rate	.08 (.34)	-.25 (.59)	.33 (8.88)**
Constant	2.81 (.34)	4.52 (.59)	-1.70 (-1.06)
Observations	506	506	506
R-squared	.59	.54	.70

t statistics in parentheses
* Significant at .05 level
** Significant at .01 level

IMPLICATIONS

Nineteen states of the U.S. currently use population formulas to restrict the number of on-premise and off-premise alcohol outlets. These formulas are envisioned as a means of reducing the negative externalities resulting from alcohol consumption or from the existence of alcohol outlets themselves. The literature identifies crime as one of these negative externalities. Previous empirical work generally supports the premise that higher concentrations of alcohol outlets contribute to higher rates of violent crime (Zhu, Gorman, and Horel 2004; Reid, Hughey, and Peterson 2003; Scribner, MacKinnon, and Dwyer 1995). The literature is less specific regarding the impact of outlet densities on non-violent crime.

This study estimates the effects of the per capita number of on-premise and off-premise alcohol outlets on rates of violent, non-violent, and total crime throughout New Jersey municipalities. We originally hypothesized that the on-premise and off-premise outlet densities will not predict municipal crime rates given the stringency of New Jersey's restrictions on the number of alcoholic beverage licenses that can be issued within a municipality. These population restrictions have generally resulted in fewer per capita alcohol outlets in New Jersey as compared to other states of the U.S. New Jersey currently has 101 on-premise outlets per 100,000 in population that are permitted to sell beer, wine, and spirits. This compares to a nationwide average of 134 beer outlets, 120 wine outlets, and 95 spirits outlets per 100,000 in population (Adams/Jobson's Liquor Handbook 1992-2004; Coate 2006). In spite of these restrictions, multiple regression results indicate an on-premise outlet effect on New Jersey municipal crime rates; that is, the per capita number of bars, taverns, and restaurants with alcohol licenses are statistically significant and robust predictors of total and non-violent crime at the

municipal level. To a lesser extent, on-premise outlet densities are predictors of violent crime rates, although the socio-demographic variables, such as poverty, better explain violent crime rates.

The results present an altogether different scenario regarding off-premise alcohol availability and the effectiveness of New Jersey's population restrictions. The off-premise outlet densities were not statistically significant predictors of municipal crime rates. New Jersey's population restrictions have significantly limited the availability of alcohol for off-premise consumption. The state currently has 22 off-premise outlets per 100,000 in population that are permitted to sell beer, wine, and spirits -- which compares to a nationwide average of 107 beer outlets, 82 wine outlets, and 38 spirits outlets per 100,000 in population (Adams/Jobson's Liquor Handbook 1992-2004; Coate 2006). While it seems that New Jersey's population restrictions have limited potential to reduce crime associated with on-premise alcohol availability, the opposite might be said regarding the state's off-premise alcohol outlet restrictions.

The results imply that New Jersey's current population formula restricting off-premise outlets (one license per 7,500 municipal residents) is more effective in limiting alcohol-related crime than the on-premise formula (one license per 3,000 residents). More stringent population restrictions on the number of bars, taverns, and restaurants with alcoholic beverage licenses may reduce the on-premise outlet effect on municipal crime rates. While this paper extends the current literature, additional research is needed that examines alcohol availability, consumption patterns, and the impact of outlets themselves on crime rates.

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