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**SUMMARY**

**THE IMPACT OF ALCOHOL CONTROL POLICIES ON THE  
INCIDENCE OF VIOLENT CRIME**

191198

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## **SUMMARY**

### **THE IMPACT OF ALCOHOL CONTROL POLICIES ON THE INCIDENCE OF VIOLENT CRIME**

#### **INTRODUCTION**

Researchers investigating the etiology of the relationship between alcohol consumption and criminal activity have been reluctant to conclude that the positive correlation between the consumption of alcohol and crime is one of causation. Since the vast majority of drinking sessions do not result in the commission of violent crimes, a direct causal relationship between alcohol consumption and crime has generally been rejected. In fact, the pervasive view held by most researchers is that if there is a relationship between alcohol and criminal activity it arises from complex interactions between psychopharmacological, contextual, and societal forces. This view is supported in this study both theoretically and empirically. Formal theoretical models of the impact alcohol on the decisions made by both potential violent offenders and potential victims are developed which show that the alcohol-violence relationship cannot be predicted a priori. Then the most extensive empirical study of the complex alcohol-policy/alcohol-consumption/violent-crime relationship produced to date is presented.

#### **DEVELOPING A FORMAL MODEL**

The non-formal theoretical frameworks or hypotheses that have been developed within this literature prior to this study are capable of generating a positive relationship between alcohol consumption and criminal activity, but some of these models suggest the positive association between alcohol and crime is entirely spurious. In contrast to the

direct-causal hypothesis, for example, the *common cause* hypothesis suggests that both alcohol consumption and violent crime are associated with some third variable (such as unemployment or short-sightedness among youth), creating the incorrect inference that a causal relation exists when in fact the relationship is merely statistical. In the *conjunctive* hypothesis, alcohol may be consumed prior to the violent criminal activity but the nature of the relationship is purely coincidental. That is, alcohol may be consumed just prior to the violent act but after the decision to commit the crime had *already* been made. Upon apprehension of the suspect a criminal investigator might inquire into whether alcohol had been consumed prior to the criminal act. If the suspect answers in the affirmative, the incident could be classified as an alcohol-related crime. However, the crime would have been committed even if the suspect had not consumed any alcohol. Thus, any inference of a causal relationship is, once again, rendered invalid.

Other non-formal models contradict both the direct-causal model's strong inferences and the common-cause and conjunctive models' spurious correlation conclusions. Under the *conditional* hypothesis, alcohol consumption may lead to violent behavior, but *if and only if* some other factor is also present. Examples of these intervening variables are temporal lobe dysfunction, hypoglycemia, sleep deprivation and alcoholism. For instance, individuals may consume alcohol as a mechanism to justify their participation in illegal activities, hoping to deflect personal responsibility for their crime because of impaired judgment. A somewhat stricter version of the *conditional* hypothesis is the *interactive* hypothesis. In this framework, alcohol only serves to increase the probability that an individual will engage in violence given that other factors that also influence the probability of engaging in crime are also present.

Of the hypotheses on the alcohol-crime relationship mentioned above, the *conditional* and the *interactive* arguments probably come closest to recognizing the true complexity of the nature of any realistic notion of causality in the alcohol-violent crime relationship, suggesting that only a *multidimensional* perspective to modeling the theoretical and empirical relationship between alcohol and violence is appropriate. This sentiment is expressed in the following quote from Lipsey et al. (1997, p. 247):

Many researchers believe that causal effects come essentially in the form of an *alcohol-person-situation* interaction. That is, *alcohol consumption increases the probability of violent behavior only for some persons in some situations.* (emphasis added)

Many empirical studies suggest that the consumption of alcohol and the incidence of criminal activity tend to be positively correlated. Despite the theoretical ambiguity regarding the nature of the alcohol-crime relationship, the common perception remains that the consumption of alcohol alters individual behavior and directly contributes to the incidence of many types of crime. Recognizing the alcohol-crime link and negative public sentiment towards excessive drinking, some policy makers and academics have advocated the use of laws aimed at curbing the consumption of alcohol as tools to fight violent crime. Economists have recently become active in this debate, providing empirical evidence that higher excise taxes on alcohol may provide an easy and effective way to reduce violent crime that is associated with the consumption of alcohol. This report investigates this allegation along with many other potential policy relationships in the context of a much more thorough examination of the relationship between alcohol control policies and violent crime than the literature has produced to date.

We develop a static theoretical model of alcohol consumption and the incidence of criminal activity in the rational offender framework that is characteristic of the

economics of crime literature. It shows that changes in the full price of alcohol will lead to ambiguous changes in the time allocated by offenders to criminal activities, and to the time allocated by potential victims to activities that may expose them to violence. In addition, the comparative statics effects with respect to the other model parameters can not be signed with certainty. *The implication of this is that increasing the cost of consuming alcohol will not necessarily reduce violent crime even if alcohol consumption is associated with the propensity to commit violent acts.*

#### COMMENTARY ON PREVIOUS ALCOHOL-VIOLENCE STUDIES

One critical factor that is almost always cited to explain trends in crime rates or the incidence of criminal behavior are deterrence factors. However, most of the previous alcohol-violence studies do not explicitly control for the effects of deterrence. While it is arguable that the effect of deterrent measures may be diminished when alcohol impairs an individual's capacity to correctly calculate the (expected) costs and benefits associated with their actions, law enforcement measures need not be completely ineffective in constraining the behavior of drinking offenders. Indeed, the overall explanatory power of many alcohol-violence models tends to be relatively low, perhaps due to the failure to account for the effects of deterrence factors.

A more fundamental issue in the recent economics literature is the surprising result that beer excise taxes appear to be a viable policy instrument for lowering the incidence of crime in several studies. These taxes make up only a small portion of the retail price of beer and as such would not be expected to substantially reduce beer consumption even if dramatically increased. This notion is exacerbated by the fact that

the price elasticity of alcohol for the demographic group that drinks the most and commits the most crime (namely younger males) appears to be relatively inelastic. After all, consumers can readily switch between more expensive alcohol brands and cheaper ones given the high degree of product differentiation in alcoholic beverages types. Tax increases might therefore lead to changes in consumption patterns within or across beverage types, but not to decreases in the overall level of consumption. A possible explanation for the apparent efficacy of beer taxes might be the failure of previous studies to consider other non-tax determinants of alcohol beverage prices, many of which may correlate with taxes. As such, the excise tax coefficient in previous studies may also be explaining the variation in these other omitted factors and therefore biased upwards. Furthermore, studies of the relationship between alcohol consumption and the incidence of violent crimes which only consider the effects of beer consumption/taxes may be looking at a relatively unimportant factor. After all, the age distribution of violent crime offenders tends to be right-shifted relative to property crime offenders and older males tend to consume hard liquor and wine at greater rates than younger males. As such, examining the effects of liquor and wine consumption and *their* respective policy controls on the incidence of Index I violent crimes is also relevant, and therefore performed in this study. In addition, laws aimed at lowering the rate of drunk-driving increase the cost of engaging in drinking behavior outside of the home. If most drinking-crime incidents outside the home, then DUI laws may also serve as a potential policy tool for reducing the incidence of violent crime in addition to drunk driving. None of the empirical studies reviewed in this report have examined the effects of such DUI laws in an empirical model of criminal participation.

## **THE EFFECTS OF ALCOHOL CONTROL POLICIES ON ALCOHOL CONSUMPTION: EVIDENCE FROM STATE LEVEL PANEL DATA, 1985-1994**

Identifying and understanding the factors that influence alcohol consumption becomes of central concern for determining whether alcohol control policies can affect violent crime. For instance, different alcohol control policies may not have symmetric effects on consumption. If minimum legal drinking ages appear to reduce consumption whereas excise taxes do not, then implementing the latter is clearly inefficient since they do not generate the intended benefit and result in only a loss of consumer surplus for the large population of nonviolent drinkers. In addition, since states self-select the number and types of alcohol control policies they implement (as well as numerous other factors such as their duration and level of enforcement) such policies may prove ineffective when other determinants of consumption (such as socioeconomic/demographic characteristics) are controlled for in an empirical model. Thus, we empirically examine whether the level or existence of alcohol control policies are negatively correlated with various measures of alcohol consumption while controlling for other demand and supply (and therefore price and quantity) determinants. This provides at least preliminary insight into which policies may be effective in mitigating the incidence of criminal activity.

Four models of per-capita alcohol consumption are specified and estimated using data from the 1985-1994 period for the U.S. states. Specifically, separate consumption equations are estimated for beer, distilled spirits (liquor) and wine using the fixed effects specification to control for missing variable bias. In addition, a total alcohol consumption measure is estimated as well. Consumption is proxied by alcohol shipments to the state.

Particular attention is paid to the effects of the most widely advocated alcohol control



policies: excise taxes and minimum legal drinking ages. The potential effects of anti-DUI laws on alcohol consumption are also considered.

If alcohol consumption has a causal effect on violent crime, the results indicate that several alcohol control policies may be effective tools for reducing the incidence of crime given that they appear to be negatively correlated with alcohol consumption. Limiting the number of licensed drinking establishments may reduce the per-capita consumption of beer, for instance, and cash laws may as well. Higher distilled spirits excise taxes are found to be negatively correlated with liquor consumption and may therefore be effective policy instruments, in contrast to results with respect to the efficacy of beer and wine excise taxes. DUI laws do not appear to reduce beer drinking, but they may influence consumption of other types of alcohol. Specifically, illegal per-se laws directed at driving under the influence may reduce liquor consumption, although other DUI controls are not robust across liquor consumption specifications. To complicate matters, some DUI laws are positively correlated with per capita consumption rates. On the other hand, dram shop laws and limits on the number of drinking establishments appear to reduce wine consumption. Thus, different policy instruments appear to be better suited for limiting consumption for different types of alcohol. There is no single "silver bullet" that can be expected to reduce consumption of all alcohol types across the board. *One thing is apparent from our results: the widely advocated prescription of using excise taxes, and particularly beer excise taxes, as a means of mitigating the myriad adverse outcomes associated with alcohol consumption may be somewhat premature.*

## THE EFFECTS OF ALCOHOL CONSUMPTION ON CRIME: THE EMPIICAL EVIDENCE

The next step in the analysis is an empirical examination of the determinants of violent crime rates controlling for deterrence factors, economic opportunities, socio-economic/demographic factors, and alcohol consumption, assuming all determinants are exogenous. The results of the regression models indicate that the consumption of some types of alcoholic beverages may be an important determinant of participation in or victimization in some violent criminal activities. Perhaps more importantly, they suggest that whatever the alcohol crime relationship may be, it varies across crime types. Wine consumption never appears to matter for any crime category, for instance, and alcohol in general appears to have very little impact on murder (although liquor may be a factor). On the other hand, liquor consumption apparently is a significant determinant of rape while beer probably is not, beer consumption appears to be strongly related to assaults while liquor has no significant influence, and both beer and liquor apparently influence the level of robbery. It seems that the people involved in different types of violent crime consume different types of alcohol. *Two lessons come from this analysis then. First, in considering the impact of alcohol on violence, aggregating violent crime categories will produce results that do not generalize across crime types. The crimes should be disaggregated as much as possible. Second, alcohol should also be disaggregated, and both liquor and beer consumption should be seen as possible policy targets depending on which types of criminal activities are being targeted. Aggregating alcohol or focusing on only one type of alcohol (e.g., beer) will not produce reliable policy prescriptions.*

These crime rate regressions support the hypothesis that alcohol is a factor that influences violent behavior, but they do not tell us much about the efficacy of various alcohol policy alternatives. It is tempting to combine these results with those from the alcohol consumption regressions, of course, treating alcohol consumption and crime rate equations as a recursive model. Using this method, our estimates suggest, for example, that a ten percent increase in liquor taxes reduces liquor consumption by four percent that would in turn result in a two percent decline in rapes. There are potential problems with such an interpretation, however. For instance, some alcohol control policies may not appear to be significant determinants of alcohol consumption but they may still have an impact on crime because they lead to substitutions between at-home and away-from-home drinking. For example, if policies against drunk driving induce people to drink more at home and less where they must drive, then to the degree that alcohol consumption affects some violent crimes that tend to occur when victims and perpetrators are away from home (e.g., robbery), that crime type may decline even with no reduction in consumption of alcohol. On the other hand, crimes involving domestic violence (family assaults) may rise. Therefore, it may be appropriate to consider the impact of alcohol control variables in reduced form crime equations. Note that if some variables appear to affect crime but not consumption, support for the *conditional* and/or *interactive* hypotheses regarding the alcohol-crime relationship would be implied.

More importantly, the parameter estimates in the crime rate regressions may be inconsistent due to simultaneity bias. While more police may reduce crime rates, for instance, high crime rates may also create demand for more police. Tests for simultaneity bias were conducted, treating deterrence variables and alcohol consumption as

endogenous, and they revealed that coefficients in all violent crime regressions except murder suffer from simultaneity bias. Similarly, the same factors (e.g., risk preferences, myopia) may simultaneously influence crime rates and alcohol consumption, creating a spurious correlation between these variables. Therefore, simultaneous equation estimation procedures were used to re-estimate the determinants of crime rates. These results were compared to reduced-form results that have typically been produced in the literature. The implication was that virtually all of the apparent relationships between alcohol-control policies and violent crimes are spurious. For instance, many of the apparent alcohol policy impacts arise exclusively through the first-stage regressions since all the second stage consumption coefficients are insignificant. Unfortunately, the simultaneous equation models did not clear up the ambiguities because the instrumental variables employed (chosen because they are commonly used in related studies of crime rates or alcohol and because better instruments could not be found) did not completely purge coefficients of simultaneity bias. This is partly a product of the fact that the instruments are not truly exogenous to the variation in the dependent variables, not an unexpected problem given the complex relationship between alcohol consumption and crime.

To better deal with the endogeneity issue, we turned to a sample of metropolitan areas for which the required alcohol shipments data was available. This is a possible remedy for the simultaneity problem because state policies can be considered truly exogenous to crime and consumption data for metropolitan areas. Data were expected to be available for 50 areas for the years 1991-98, but missing data reduced the sample to

such an extent that fixed effects models could not be used. The resulting estimates did nothing to clarify the ambiguities raised using the state data.

## CONCLUSION

There are four important general implications that can be drawn from our empirical analysis of the relationship between alcohol consumption and violent crime. First, policy implications from a statistical study of violent crime that either aggregates all individual crimes (i.e., focuses on total violent crime) or only considers one crime category cannot be generalized because deterrence, socio-economic/demographic/deprivation and alcohol consumption relationships apparently vary dramatically across violent crime categories. Second, policy implications drawn from statistical studies of the alcohol/violence relationship that either aggregate alcohol types or focus on one type of alcohol (e.g., beer) cannot be generalized because whatever the alcohol-violence relationships may be, they apparently vary considerably with different types of alcohol having different influences across crime categories. Third, drawing policy conclusions regarding the alcohol/violence relationship from reduced-form models appears to be inappropriate since they suffer from simultaneity bias which leads to misinterpretation of correlations as causal when they are actually spurious. Finally, if there is an alcohol/violence relationship, it probably is a complicated relationship involving the circumstances in which alcohol is consumed and/or the characteristics of individuals who consume the various types of alcohol that either make victims more vulnerable or potential offenders more likely to be aggressive.

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The first three of these conclusions are rather negative inferences, of course, as compared to the stronger policy specific recommendations that one hopes for in this type of study. They are nevertheless important from a policy perspective as they suggest the need for extreme caution in attempting to draw policy-specific recommendations from studies that do not attempt to (or cannot) control for the complex web of factors that may influence the potential alcohol-violence relationship.

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