IMPACT OF LEGISLATION TO PROHIBIT HAPPY HOURS

Executive Summary

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INTRODUCTION

This report presents results from a comprehensive evaluation of Indiana's 1985 legislation banning "happy hours," the provision of alcoholic beverages at reduced prices during certain days and hours. The evaluation employed an interrupted time series design with non-equivalent dependent variables. The specific goal was to determine whether any reduction in automobile accidents could be attributed to the ban, using a research design that capitalizes on the restricted days and times comprising happy hours. A more restricted analysis of Massachusetts' December 1984 "happy hours" legislation is also reported.

This evaluation has revealed no evidence that Indiana's law reduced automobile accidents in the state. After estimating ARIMA models for those days and times corresponding to the periods most likely to be affected by the ban, estimates of the intervention parameter were not significant in any case. Furthermore, intervention components for three control series were negative, and approached statistical significance in one instance, suggesting an exogenous reduction in accidents during times and days when the happy hour ban could have had no effect. Analysis of accidents where there was evidence of alcohol involvement were similar. Intervention effects were positive but non-significant for the treatment series, and negative but non-significant for the control series.

METHODS

Data

Data used in this evaluation were extracted from the 1983 through 1986 Accident Statistical Master (ASM) tapes, archived by the Indiana State Police. Each ASM includes annual compilations of all accidents reported to all law enforcement agencies in the state. The total number of accidents increased each year, from about 148,000 in 1983 to 173,000 in 1986. Indiana accident data records have been designed to comply with standards required under the 1982 Highway Safety Act (23 USC 401), and promulgated by the US Department of Transportation's "Uniform Standards to State Highway Safety Programs" (23 CFR 1204.4).

Motor vehicle accident data was also obtained from the Registry of Motor Vehicles in Massachusetts. These data were obtained for the years 1983 through 1985. The total number of accidents increased from about 183,000 in 1983 to 205,000 in 1985.

Design

This project employed a particular class of interrupted time series design described by Cook and Campbell as a non-equivalent dependent variables design (1979: 218-220). Following the conventions used in Cook and Campbell, the design is represented by the following diagram:

O_{a1} O_{a2} O_{a3} O_{a4} X O_{a5} O_{a6} O_{a7} O_{a8}

O_{b1} O_{b2} O_{b3} O_{b4} X O_{b5} O_{b6} O_{b7} O_{b8}

where O_{ai} and O_{bi} refer to the i_{th} observation of variables a and b, respectively the <u>treatment</u> and <u>control</u> series. Variables a and b are conceptually similar, but not equivalent. Variable a is, <u>a priori</u>, expected to change following the intervention, while variable b should not be affected.

Prohibiting happy hours can be expected to reduce auto accidents occurring only at certain times of day. If the happy hour ban is effective, there should be a reduction in accidents during the times and days of the week when such festivities were most common, the treatment series. In most cases this means between the hours of 4:00 and 8:00 PM on Monday through Friday. While one would expect a reduction during these times and days, there is no plausible reason to expect a reduction in accidents at other times, the control series.

The Massachusetts analyses was significantly limited by the fact that a significant portion of Massachusetts' motor vehicle reports had inaccurate information on the time of day the accident occurred. Inaccuracy in time of day information was identified because an unexpectedly high proportion of Massachusetts motor vehicle accidents appeared to occur in the

early morning hour (i.e., 2 AM to 6 AM). This pattern of accidents did not confirm to time the pattern observed in other states, nor did it conform to the know pattern of traffic in Massachusetts. In addition, a cross check of a sample of computerized motor vehicle accident records with their original manual record report revealed numerous time of day discrepancies.

Unfortunately, for the purposes of the Massachusetts analysis, it was not possible to identify (short of cross checking all the computerized records with their manual report counterparts) which records had correct time of day information. As a result, it was not possible to develop a non-equivalent dependent variable design for the Massachusetts analysis.

Defining Treatment and Control Series

An iterative strategy was followed in defining treatment and control series. Analyses were conducted on the following day-time combinations:

Treatment Series

Mon-Fri 4:00 through 6:00 PM
Mon-Fri 6:00 through 8:00 PM
Mon-Fri 4:00 through 8:00 PM
Tues-Thurs 4:00 through 6:00 PM
Tues-Thurs 6:00 through 8:00 PM
Tues-Thurs 4:00 through 8:00 PM

The 4:00-8:00 PM series is the sum of the other two treatment series. This hourly aggregation was examined to test for the possibility of spillover effects, in which persons attracted by cheap drinks during the typical 4:00-6:00 festivities settled in until later hours.

Control Series

Mon-Fri 8:00 PM through midnight
Mon-Fri midnight through 4:00 PM
Tues-Thurs 8:00 PM through midnight
Tues-Thurs midnight through 4:00 PM
Saturday and Sunday

Suspected Alcohol-Involvement Series

In addition to the analysis of all accidents occurring during the various day-time combinations, we examined accidents for which there was evidence of alcohol involvement. Accidents where alcohol was suspected as a contributing factor were identified if they met one of two criteria: (1) physical state of drivers was coded "had been drinking," or (2) results of breath and blood tests revealed a blood-alcohol content of .08 or higher.

There were relatively few suspected DUI accidents, and it was necessary to aggregate them into a smaller number of day-time intervals:

Monday through Friday, 4:00 - 8:00 PM
Monday through Friday, 8:00 PM - midnight
Monday through Friday, midnight - 4:00 PM
Saturday and Sunday

Intervention and Independent Variables

The implementation of Indiana's law on 1 September 1985 is the intervention component. The law became effective in week 140 of the 210-week series. The intervention variable was therefore set at zero for weeks 1-139, and one for weeks 140 through 210.

Additional independent variables, were included, to more adequately represent factors known to affect driving patterns and the frequency of auto accidents. Adverse weather in winter months increases accidents, and the number of accidents where road conditions were coded as "snowy" or "icy" was included in models for each treatment and control series. Holidays modify working patterns, as many fewer people drive to work during the morning and afternoon commuting hours. This produces an exogenous decline in happy hour accidents, corresponding with part of afternoon commuting, during many weeks that include holidays. To control for this effect, a dummy variable was included in weeks including holidays over the four-year period.

The Massachusetts analysis was restricted to examining changes in total accidents. As noted, data inconsistencies prevented more detailed analyses.

FINDINGS

The happy hour ban had no significant effect in any series. The first-order moving average parameter, $\tilde{O}_1$, and the random snow variable had the greatest impact on weekly accidents for each hourly aggregation. In each case the seasonal component, $\tilde{O}52$, improved the model fit somewhat, and was negative, reflecting a general trend of less severe winters over the four-year period. The significance of snowy weather is underscored by the fact that seasonal ARIMA parameter estimates were much higher in initial models from which the snow variable was omitted, but were otherwise less satisfactory. This is because snow accounts for much seasonal variation in most series, and the necessarily approximate estimate of weather effects by seasonal ARIMA terms obscures this. Including a variable that, a priori, accounts for much seasonality is more theoretically satisfying, and produces better fitting models.

Holidays have a significant effect on accidents only for the 4:00-6:00 PM series. As expected, weeks with holidays have slightly fewer accidents, but this is only true for the evening commuting hours. This is sensible, since holidays modify working patterns for many people, and reduce obligatory driving during evening rush hours. As a result, federal holidays produce a decline of about 16 accidents per week in this two-hour period during normal working days.

The happy hour intervention component did not approach significance for any of the treatment series, and the estimate in each case was positive. By itself, this is not conclusive evidence that banning happy hours had no impact on auto accidents. It is possible that any decline in the treatment series due to the happy hour ban might be offset by an exogenous increase in all accidents. The happy hour ban could therefore be effective if there were a greater increase in accidents during non-happy hour times. That is, a finding of no impact for the treatment series, and a significant positive estimate for the intervention component during the control series would be evidence that the happy hour ban produced a relative decline in auto accidents.

The analysis of the Massachusetts experience, although limited, also produced no observable impact of "happy hours" legislation. In the year preceding the introduction of this legislation (1985) there were 195,353 motor vehicle accident reports in Massachusetts: in the year following, there were 205,824. Data limitations, however, preclude any conclusions regarding the Massachusetts legislation.

However plausible, this prospect was not supported by analysis of the control series. The intervention parameter estimate was negative for each control series, and approached statistical significance for Saturday and Sunday accidents.

Analysis of the suspected DUI series also revealed negative parameter estimates for the happy hour intervention. This reinforced our interpretation of negative estimates for the control series which included all accidents. Policies other than the happy hour ban reduced accidents in the control series and suspected DUI accidents because drunk driving, and alcohol-related accidents, are more common during this time. In all likelihood this pattern was due to a combination of more concentrated enforcement during higher risk days and hours, increased deterrence during these times, and selective targeting by law enforcement personnel. Selective targeting means that police are less inclined to strict enforcement in lower risk hours, so neither enforcement nor deterrence has much of an impact.

Our confidence in these findings is increased by a pattern of results that cannot be readily interpreted in any other way. This is precisely the strength of the non-equivalent dependent variables design. It enhances construct validity by postulated different patterns for different series, and basing these predictions on what is known about the behavior under study and how it could and could not plausibly be affected by an intervention.

The strength of a non-equivalent dependent variables design, together with the unequivocal results of data analysis support our conclusion of "no impact". Non-compliance and evasion by tavern owners are among the possible reasons for this finding, but our investigation of the enforcement process and interviews with Indiana officials suggest that evidence points in two directions. On the one hand, Alcoholic Beverage Commission (ABC) officials and state legislators claim their objective was to halt two-for-one specials; there is no evidence that this uncharacteristically specific prohibition is being evaded. This together with the admission that other provisions of the bill are being successfully avoided suggests something more than sporadic evasion.

On the other hand, the incentive structure of the hospitality industry supported calling an end to competitive price wars, and most tips on suspected violations have come from bar owners. Nationwide reports of relief among innkeepers in states where happy hours are restricted in some way suggests that most establishments would be unwilling to seek out creative ways of reducing their profits (Orange County Register, 13 January 1987; New York Times, 23 June 1985; Frydman, 1985).

Loopholes in the happy hour law avail imaginative and contrary tavern managers several avenues for offering beer or drinks at reduced prices. Again, no hard evidence can be found

to assess the scope of such evasion, but ABC officials, Excise Police, and industry lobbyists felt that such practices were not widespread.

It is also unlikely that other anti-DUI policies obscured an impact of the happy hour ban. Our indirect evidence concerning the effectiveness of other laws found an exogenous decline in all accidents and alcohol-related accidents during non-happy hour periods, but no decline during treatment series. It is highly improbable that tougher enforcement and deterrence would reduce alcohol-related accidents during times when drunk driving is more common, but not reduce such accidents at other times. This explanation is also undermined by the 1986 reversal, in Indiana and nationwide, of a downward trend in alcohol-related accidents.

CONCLUSION

Happy hour legislation in Indiana and elsewhere is best viewed as an example of symbolic action against a policy problem in the face of public pressure to do something. It is understandably tempting for legislators to get on the anti-drunk driving bandwagon, and hard to imagine effective opposition to curbing a practice that encourages heavy drinking in bars.

This is an example of the gap between the high principles of legislative enactments and the pragmatic details of implementation. Other research illustrates this with respect to

policies aimed more squarely at drunk driving (Ross and Foley, 1987). Prosecutors, judges, and jailers hesitate to impose the stiff penalties required by law, justified in part by their perception of discrepancies between the popular view of killer drunks, and the chagrined middle class community resident standing before them

Our research indirectly supports the view that effective drunk driving requires systemic action, and cannot rely on assumptions that policies will implement themselves. If license suspensions and jail sentences are to dissuade offenders from repeating their transgressions, then certainty of punishment should be assured. If publicity and public support enhance general deterrence, it must be recognized that the issue attention cycle is fickle and easily displaced. When public priorities shift from alcohol, the most widely abused drug, to other concerns, media themes and public attention obligingly follow.

We therefore cannot recommend that states be encouraged to restrict happy hours. But neither is there any reason to rescind policies adopted in Indiana and other states. In the first place, the direct targets of such restrictions all but welcomed the ban. It would be odd, at best, to justify a reversal by citing either the skepticism of researchers or the need for deregulation to increase competition among bar owners. More

importantly, per capita alcohol consumption has declined in recent years among all but those too young to legally drink in the first place (Williams et al., 1986). There is no justification for symbolic action to endorse its increase by repealing happy hour prohibition.