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ABSTRACT

The purpose of this paper is to empirically estimate the propensity for alcohol-related policies to influence rates of entry into foster care and the length of time spent in foster care. Alcohol consumption is believed to be major contributing factor to child maltreatment, associated with an increased likelihood of abuse and longer durations once in foster care. We analyze a panel of state-level foster care entry rates over time, followed by a duration analysis of individual-level cases. The alcohol regulations of interest include beer, wine, and liquor taxes and prices, and a measure of alcohol availability. Overall, these alcohol control policies appear to have limited power to alter foster care entry rates and duration once in care. We find that higher alcohol taxes and prices are not effective in reducing foster care entry rates, however, once in foster care, the duration of stay may be influenced with higher taxes, particularly when the entry was a result of an alcohol abusing parent.

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1. Introduction

Parental substance abuse problems can be extremely detrimental to the health and well being of children. Children of substance abusers are at a much greater risk of physical, mental, and sexual abuse, and suffer more physical and mental health problems than children in the general population [Center on Addiction and Substance Abuse (CASA) 2001; Puttler et al. 1998]. The Substance Abuse and Mental Health Services Administration estimates that approximately 5.156 million children live with parents who abuse or are dependent on alcohol (Office of Applied Studies 2003).

Nearly 1 million children annually are victims of child abuse and neglect. Estimates of alcohol involvement in cases of maltreatment range from 40 to 70 percent of all cases (Famularo, Barnum, and Wharton 1986; Children of Alcoholics Foundation 1996; CASA 2001). Some of the children of substance abusing parents will have encounters with state child protective services, and these children may be temporarily or permanently separated from their parents in order to provide a safe and stable environment. The problems related to parental substance abuse places a tremendous burden on the child welfare system. The U.S. Department of Health and Human Services (USDHHS 1999) states, "…it is clear that throughout the child welfare system, but especially with respect to children in foster care, alcohol and other drug abuse are recognized as major contributing factors to child neglect and abuse and are two of the key barriers to family reunification." The burden of substance abuse problems translates into an estimated annual $5.3 billion of state spending for child welfare and over $10 billion in combined federal, state and local government spending (CASA 1999, 2001).

The close association of parental alcohol abuse and the maltreatment of children suggests that alcohol control policies can play a tremendous role in improving the lives of abused

children. In this paper, we examine the relationship between alcohol control policies and the most severe cases of child abuse—those resulting in the child's removal from the home and placement into child protective services. Specifically, we estimate the propensity for alcohol-related policies to influence rates of entry into foster care and the length of time spent in foster care.

This research has implications for not only the current situation of these children, but for their future success as well. Research has linked abuse during childhood to adverse outcomes such as delinquency and poor mental and physical health, which in turn have implications for labor market outcomes later in life (Widom 1989; Felitti et al. 1998; Smith et al. 2005; Tekin and Markowitz 2008).

The link between excessive alcohol consumption or alcohol abuse and child abuse, which has been found in many studies, does not necessarily imply causality from the former behavior to the latter. It is possible that variations in one or more unobserved "third variables" may cause these behaviors to vary in the same direction (see Markowitz 2000 for a discussion of the causality issue as it relates to domestic violence). Nevertheless, the studies showing a high prevalence of alcohol abuse and dependency among parents of abused children provide the motivating context for this study. Estimates of alcoholism among parents of abused children range from 38 percent to 69 percent (Behling 1979; Famularo et al. 1986). Studies find that parents of abused or neglected children have much higher reported substance use than nonabusive parents. For example, Kelleher et al. (1994) control for some possibly confounding variables and find that parents of abused (neglected) children are 2.7 (4.1) times more likely to have a substance abuse problem than other parents. DeBellis et al. (2001) also show a higher incidence of alcohol and/or substance abuse or dependence disorders among parents of

maltreated children as compared to sociodemographically similar parents of non-maltreated children.

In substantiated cases of child abuse and neglect, one-third to two-thirds are believed to involve parental alcohol abuse or abuse of other drugs, although estimates go as high as 97 percent (USDHHS 1999; CASA 1999). Alcohol is the primary culprit in these reports. One report found that alcohol was involved in 77 percent of cases and was more harmful than drugs (cocaine, primarily) in 64 percent of the cases (USDHHS 1999).

The most severely maltreated children may end up removed from the home and placed in foster care. Sixteen percent of families with a substantiated case of child abuse have the child removed to foster care (USDHHS 1998). Among foster care children, research has shown that children coming from families with substance abuse problems remain in foster care longer than other children and are more likely to enter the system multiple times (Frame et al. 2000; Frame 2002). These children are also more likely to be neglected than abused (Walker et al. 1994).

The effectiveness of alcohol control policies in improving the lives of children is an understudied area in the disciplines of economics and public policy. Previous research approaches the study of the alcohol-violence relationship using the large body of economic literature on the demand for alcohol (see Grossman 2005 for a survey of this literature). This literature demonstrates that alcohol consumption and excessive consumption are inversely related to the price of alcohol and to measures of its availability. The latter variables include the minimum legal drinking age, the number and types of outlets that are permitted to sell alcohol, and statutes pertaining to alcohol advertising and server liability. Based on this literature and on the well documented relationship between alcohol and domestic violence, Markowitz and

Grossman (1998, 2000) and Markowitz et al. (2010) show that higher alcohol prices and restricted availability are effective in reducing the incidence of child abuse.

Markowitz and Grossman (1998) uses data from the 1976 National Family Violence Survey to estimate models in which the incidence of child abuse is affected by the state excise tax rate on beer, illegal drug prices, marijuana decriminalization, laws restricting alcohol advertising, the per capita number of outlets licensed to sell alcohol, and demographic and socioeconomic characteristics of parents. Violence measures are collected in the survey by use of the Conflict Tactic Scale (CTS). The CTS gathers information on the number of times in the past year a parent has committed a violent act by first asking questions about verbal solutions to disagreements and building up to questions on the occurrence of violent acts. Results from this study show that increasing the tax on beer can be an effective policy tool in reducing violence. The findings imply that a 10 percent increase in the tax on beer would reduce the probability of severe violence by 2.3 percent and the probability of any degree of violence by 1.2 percent. The estimates suggest that a 10 percent hike in the beer tax would have lowered the number of severely abused children by about 132,000 in 1975. Markowitz and Grossman also find that laws designed to make obtaining beer more difficult also may be effective in reducing violence. These laws include "dry" county laws, laws prohibiting beer sales in grocery stores, and liquor outlet densities. However, restrictions in advertising and increases in illegal drug prices have no effects on child abuse.

In a follow-up study on child abuse, Markowitz and Grossman (2000) pool data from the 1985 and 1976 National Family Violence Surveys to establish two important results. First, violent acts against children committed by females are much more responsive to beer taxes than similar acts committed by males. One explanation of this finding is that alcohol consumption by

females is more sensitive to the price of alcohol than alcohol consumption by males. Second, by pooling the two surveys with a set of state dummies, the authors establish that the negative tax effects for females are not due to unobserved state factors. In particular, the magnitude of these effects are largely unaffected by the inclusion of the state dummies.

In a more recent paper, using data from 1994 to 2004, Markowitz et al. (2010) focus on an objective measure of child maltreatment as opposed to parental reports. These data capture the most severe cases – cases that are serious enough to warrant investigation by child protection services. The results show that higher taxes and prices of beer, liquor, and ethanol are negatively related to maltreatment rates and child fatalities. Restrictions on alcohol in the form of fewer licensed outlets per capita, are also associated with improvements in child welfare.

Freisthler (2004) and Freisthler et al. (2005) examine the relationship between alcohol outlet densities and rates of child abuse. These papers both find that areas in California with higher densities of alcohol outlets also have higher rates of child maltreatment. The results of these studies must be interpreted with caution as it is impossible to know whether the abusers are choosing to locate in areas with high-density outlets or whether the availability of alcohol contributes to the abuse.

Economists have also examined other determinants of child abuse using the state-level panel data used in this paper. For example, Paxson and Waldfogel (2002) examine the ways in which children are affected by the economic circumstances of the parents. Bitler and Zavodny (2004) and Seiglie (2004) also examine state-level panels of child abuse and neglect, with a focus on the effects of abortion restrictions in reducing child maltreatment.

This current paper expands on the previous literature by examining the effectiveness of policy on the most severe cases of child abuse—those resulting in the child's removal from the

home and placement into child protective services. While previous research has shown children coming from families with substance abuse problems remain in foster care longer than other children and are more likely to enter the system multiple times, it is not clear whether stricter alcohol control policies can alter these outcomes. It is possible the relationship between alcohol and foster care entry may reflect other unobserved factors about the family's life, rather than be a true causal relationship. As we discuss below, estimating the reduced form equation, which directly links the policies to the outcomes, will help shed light on the nature of the relationship between alcohol consumption and child abuse.

2. Analytical Framework

The framework for this project involves two well-established relationships: the relationship between alcohol consumption and the maltreatment of children, and the negative relationship between alcohol consumption and the full price of alcohol. If a parent's alcohol consumption leads to an increased risk for child maltreatment, then following the law of demand, an increase in the price of alcohol should reduce consumption and thereby reduce the risk of maltreatment. The "reduced form" equation directly relates alcohol prices and policies to the outcome of interests, entry into foster care and the duration of foster care placement. This strategy has been used extensively in the economics literature to study the role of alcohol policies in reducing the negative outcomes associated with consumption (Cook and Moore 1993; Markowitz and Grossman 1998, 2000; Dee 2001; Chesson et al. 2000; Markowitz et al. 2003).

We seek to answer two main questions in this paper: 1) are stricter alcohol control policies effective in reducing entry into the foster care system, and 2) are stricter alcohol control policies effective in reducing duration in foster care, once a child is placed in the system?

We begin with an analysis of entry rates into foster care. The empirical equation is as follows:

(1) $Ln(F_{jt}) = \alpha_0 + \alpha_1 P_{jt} + \alpha_2 X_{jt} + \alpha_3 \lambda_j + \alpha_4 \tau_t + \varepsilon_{jt.}$

Equation (1) shows the determinants of foster care entry rates (F) for state j in time t (quarters from 1998-2004). The vector P represents components of the full price of alcohol, which will be measured with alcohol taxes, prices, and alcohol availability. The model includes variables designed to capture observed characteristics of the state (X) as described below. In addition, state dummies (λ) will capture unobserved time-invariant state-level effects which may influence entry rates. Time dummies (τ) will capture secular trends. Because of skewness in these data, we analyze the log of the entry rates. We estimate the rates with Weighted Least Squares (WLS) with the population of children as the weight, and adjust the standard errors for unknown heteroskedasticity and within-state cluster correlation (Bertrand et al. 2004). A negative binomial regression count model is used where the rates contain a large proportion of zeros. These models are also adjusted for population and within-state cluster correlations.

Second, we use hazard models in order to estimate the effects of alcohol policies on the duration of time spent in foster care. To do so, we divide time into three-month intervals (quarters), indexed by *t*. We observe foster care spells from 1998 to 2004 giving us a total of 28 quarters of observation. The discrete time hazard rate is the probability that a child leaves foster care in period *t*, conditional on staying in foster care up to this period. To estimate this model we chose a complementary log-log (extreme value) specification. The complementary log-log model is

(2) $h_{i,t} = 1\text{-}\exp\{\text{-}\exp[\theta(t) + \beta' P_{jt,} + \gamma X_{jt,} + \lambda_j]\} \iff$

$\log[\text{-}\log(1\text{-}h_{i,t})] = \theta(t) + \beta' \mathbf{X}_{i,t}$

where $P_{i,t}$, $X_{i,t}$ and λ_j are the fixed and time-varying characteristics, β and γ are coefficient vectors and $\theta(t)$ represents the parameterization of the baseline hazard. In the duration models X includes individual characteristics, age at entry into foster care, gender, race, ethnicity and whether or not the child had a disability, along with the state characteristics. We chose a flexible form for the baseline hazard using indicators for each quarter.

3. Data

Data on foster care entrants come from the Adoption and Foster Care Analysis and Reporting System (AFCARS). This is a federal data collection system that collects event level information for all children removed from their parents and placed in foster care, including the date of foster care entry and exit for each child, information on the child's demographics, disabilities, reasons for removal, and foster care case goals.

Entry rates

The AFCARS data is used to create counts of the number of children entering foster care every quarter. Termed "removals," this count includes new entrants into the foster care system along with children who previously have been in foster care and are re-entering in the current year/quarter. We focus on entrants rather than the total number in care so that we can more closely match the alcohol variables to the date of the abuse and subsequent removal from the home.

One advantage of the AFCARS data is that the reason for removal is reported for each case. We use this information to create an additional dependent variable of the number of children removed because of an alcohol abusing parent. In this data, alcohol abuse is defined as "the principal caretaker's compulsive use of alcohol that is not of a temporary nature" (National

Data Archive on Child Abuse and Neglect 2002). Since not all cases of abuse are alcohol-related, this second dependent variable will identify the group of parents who are known to regularly consume alcohol. The drinking behaviors of all adults are potentially affected by changes in the full price of alcohol, however, the determinants of the decision to drink may be very different from the determinants of quantity among the heaviest drinkers. This dependent variable therefore will allow us to isolate the effects of alcohol policies on behaviors of alcohol abusers. Note that this variable is not our primary focus because of the potential for alcohol to be a distal or indirect cause of abuse when it is not recorded as the immediate cause.

Next, we employ as a dependent variable the number of children removed because of the child's alcohol problem. This is a relevant outcome because youth alcohol consumption is influenced by alcohol control policies (Grossman et al. 1998; Nair et al. 2001) and because children of parents who abuse alcohol may be more likely to abuse it themselves (Grant 1998; Otten et al. 2008).

The foster care removal data are available beginning in 1995; however, most states did not begin reporting until 1998, so this is the first year of our panel. In 1998, all but 8 states provided annual foster care data. In 1999, Nevada was the only state not to provide data and by 2000, all states reported. Our data collection ends in 2004.[1] Fewer observations are available for counts of removals due to child or parent alcohol abuse because many states did not begin reporting until later years of the data. The states of Alaska, Illinois, New York, and Wyoming never reported child or parent alcohol abuse as the primary reason for removal. These states are excluded from the analyses when removals due to child or parent alcohol abuse are the dependent variables.

Descriptive statistics for all variables are shown in Table 1. As can be seen from this

[1] There were no state level beer tax changes and only one state liquor tax change between 2004 and 2008.

table, entry into foster care entry is fairly common. Average quarterly counts for the number of foster care entries range from 110 to 15,421 with a mean quarterly rate of 1.4 entries per 1,000 children. Entry rates as a result of alcohol abuse are much less common with mean quarterly rates of 0.14 and 0.02 per 1,000 children for parent and child alcohol abuse, respectively. Entry counts from parental alcohol abuse ranges from 0 to 1,752. Zeros occur twelve times in this data, accounting for 1 percent of the observations.[2] Zeros are much more common in the entry rates for child alcohol abuse, accounting for 13 percent of the sample. Because of the large number of zeros and the small range of values here, we use a negative binomial count regression model to estimate these counts.

Length of stay

For the duration analysis, we include only the first entry observed into foster care. Note that some children are never reunited with a parent, for instance, if the parent died or is in prison. Because the AFCARS data identify the case goal for each child and we are able to select only those children for whom the goal is reunification with parents. For other children, whose goals are emancipation, adoption or similar, administrative and legal proceeding may be more salient in determining length of stay than alcohol policies. These are excluded. When reunification is possible, alcohol control policies may be a relevant determinant of length of stay if the policies have influence on adult drinking behavior. For each child duration is measured in calendar quarters in order to match our alcohol control variables.

As with the entry rates, we use the information on reason for removal to analyze durations among only those children who were removed because of an alcohol abusing parent or

[2] Zeros are replaced with a value of 0.5 before taking logs. Negative binomial count models were tested with the zeros included. Results for are very similar to WLS models.

because the child was abusing alcohol. Table 1 shows the average duration of a foster care stay is 10.3 quarters for all children, 10.8 quarters for children of alcohol abusing parents, and 9.1 quarters for children who were removed for abusing alcohol.

Alcohol Regulations

Several variables are used to measure state-level alcohol regulations. First, four different measures of the tax of alcohol are examined and compared. The real (1982-1984=1) state and federal excise tax on beer is the first. Beer taxes come from the Beer Institute's *Brewers Almanac*. As wine rivals beer popularity (Bloomberg 2005), the real state and federal excise tax on wine is the second measure of the tax on alcohol. Wine taxes come from the Distilled Spirits Council of the United States (DISCUS), *History of Beverage Alcohol Tax Change, 1996* and the National Conference of State Legislatures, *State Tax Actions, 1995-2003*.

Liquor taxes are the third measure of the tax on alcohol. These taxes, which come from the same sources as the wine taxes, are employed because of the widespread opinion that spirits consumption is potentially more dangerous than beer or wine consumption (for example, Saffer 1991) and because of Cook and Tauchen's (1982) seminal study that reports a strong inverse relationship between spirits taxes and cirrhosis mortality. State excise tax rates on liquor are only available for the 33 "license" states (including the District of Columbia) where the state government does not have monopoly control of the retail sale of liquor. The 18 monopoly states derive their revenue from the sale of liquor from markups rather than from excise taxes. (A complete listing of the liquor sales control method for all states can be seen in Appendix A.) Implicit tax rates for these states can be imputed along the lines suggested by Cook et al. (2005). Let LP_{lt} be the average price of liquor in the 33 license states in year t from the source indicated below and let LT_{lt} be the average excise tax (including the federal tax) in these states in year t.

Define Q_{lt} as price exclusive of tax ($Q_{lt} \equiv LP_{lt} - LT_{lt}$). Then the implicit tax in the j^{th} monopoly state in year t (LT_{mjt}) is

$$LT_{mjt} = LP_{mjt} - Q_{lt}. \quad (2)$$

This assumes that the average cost incurred by state-owned stores in selling liquor is approximately equal to the mean of this cost in license states. Unlike Cook, Ostermann, and Sloan (2005), we allow Q_{lt} to vary by year. The liquor price is taken from ACCRA's *Cost of Living Index*, but is missing for Maine (all years), Vermont (2002) and New Hampshire (2002-2004). Therefore, the imputed liquor tax is missing for these states and years as well.

Note that beer is sold privately in all monopoly states and wine is sold privately in all these states except for Pennsylvania, New Hampshire and Utah. Hence, beer excise taxes are available for all states, and wine excise taxes are available for all states except for Pennsylvania, New Hampshire and Utah. For those three states, we will employ an imputation procedure similar to the one described above for liquor.

Beer, wine, and liquor tax rates are too highly correlated to include in the same regression. A specification can be obtained, however, that contains a summary measure of the three tax rates, namely the tax rate on an ounce of pure ethanol. This tax is computed by first computing the tax on an ounce of ethanol in each beverage and then averaging, using the fractions of total ethanol consumption accounted for by beer, wine, liquor, respectively as weights. These weights are fixed over time and are averages for the U.S. as whole during our sample period. Indicators for observations with imputed liquor and wine taxes are included in these models as well.

Alcohol taxes have been shown to be excellent predictors of alcohol consumption (for example, Cook and Tauchen 1982; Cook and Moore 1993; Grossman et al. 1998), but successful

estimation of effects in a panel of states relies on variation in the nominal taxes over the sample period. Unfortunately, the variation in taxes is somewhat limited in the foster care data. Between 1998 and 2004 there are 18 changes in the beer tax in 9 states, 13 changes in the wine tax in 8 states and 9 changes in the liquor tax in 6 states. Because of the limited variation in taxes, we present alternative models that include the ACCRA retail prices of beer, wine, liquor and ethanol rather than the taxes.

Retail prices that are inclusive of state and federal taxes for beer, wine, and liquor are published quarterly by ACCRA in the *Inter-City Cost of Living Index* for between 250 and 300 cities across the United States. State average annual prices are generated by using a population weighted average of the city prices present in each state. All prices are deflated by the CPI and the ACCRA cost of living index. We have also adjusted the price data for brand changes in beer over time. In the models below, we include each alcohol price separately and as a composite price of ethanol computed in the same manner as the ethanol tax.

The availability of alcohol is an important component of the full price, so all models include the number of retail outlets per 100,000 population that are licensed to sell liquor for on-premise or off-premise consumption. These data come from *Jobson's Liquor Handbook*. With larger percentages of populations living in dry counties or with fewer outlets available, travel time to obtain alcohol increases, adding to the full price of alcohol. If alcohol consumption contributes to child maltreatment, then it is expected that policies which make obtaining alcohol more costly will reduce the incidence of maltreatment.[3]

[3] The percent of a state's population living in dry counties is another potential availability measure. This variable was tested in the models but suffers from limited variation during our sample period and is therefore is not included. However, results suggest that areas with larger populations in dry areas have lower foster care entry rates. These are available upon request.

Equations 1 and 2 also include state characteristics which may help determine child abuse rates. In all models we will include the female labor force participation rate, the unemployment rate, real income per capita, the percentage of the population living in rural areas, and the percentage of the population 25 years and over that has obtained a bachelor's degree. The percentages of each state's population identifying with certain religions (Catholic, Protestant, Southern Baptist, Mormon) are included as well. All models also include state dummies to help to capture any unobserved time-invariant state effects which may influence child maltreatment and may be correlated with the alcohol control policies.

Lastly, we test specifications with total spending per child population on child welfare programs in the state. This spending represents total dollars from federal, state, and local sources. These data are available biennially from 1996-2004. We have interpolated the odd years from 1995-2003 using rates of growth. We include this variable to help account for the resources dedicated to each state's foster care systems since states with more resources may be more likely or able to remove children from their homes. It is possible that this variable is endogenous in that states with more need for child welfare programs may allocate more resources towards this activity. We tested models that exclude this variable and the results of the alcohol price and policy variables remain unchanged.

Entry rates

Tables 2, 3, and 4 show the effects of alcohol taxes on the all-cause and the alcohol related foster care entry rates. Eight models are shown within each table: Column 1 includes the excise tax on beer. Column 2 includes the wine tax among license states only so that no imputed values are included. Column 3 shows the wine tax for all states with the imputed values and the

indicator variable for the monopoly states. Columns 4 and 5 are similar to 2 and 3, with the liquor replacing the wine tax. Columns 6, 7 and 8 include the ACCRA prices instead of the taxes. Models were run using the derived ethanol tax and ethanol price but are not shown for brevity. These results are discussed in the text. All models in the tables also include the number of liquor outlets per capita, the state characteristics, per capita total spending on child welfare, year indicators, quarter indicators and state fixed effects.

Table 2 contains the results for the log-linear models of the child entry rate into foster care. The results show that the coefficients on all the alcohol tax and price variables are negative but statistically insignificant. The same holds for the computed ethanol tax and price. Liquor outlets also are not associated with changes in all-cause foster care entries. A similar story holds for entries into foster care because of alcohol abuse by a parent (Table 3). For parents, almost none of the alcohol tax coefficients are statistically significantly, with the exception that liquor taxes in the full sample is, but only at the 10 percent level in a two tailed test. Outlets also have no effect on entry rates.

By contrast, the results in Table 4 show that children entering foster care because of their own alcohol abuse are highly responsive to higher alcohol taxes. The coefficients are negative in all models, and statistically significant in all models except when wine is included with the imputed values. The coefficient on the composite ethanol tax is also negative and statistically significant at the one percent level (not shown). However, these results should be interpreted with some caution since the models with the ACCRA prices show negative, but statistically insignificant price effects on these entry rates. The results from the liquor outlets are also suggestive, but not conclusive. The coefficients on outlets are positive in all models, and statistically significant in five of the eight models presented.

Only a few of the other include state-level variables explain the variation of entry rates into foster care. Higher rates of female labor force participation and a few of the religion variables are the only other control variables that are statistically associated with the all cause entry rate. States with more highly educated populations and less rural populations are associated with fewer foster care entries due to alcohol abusing parents. None of these state level variables are associated with entry rates for alcohol abusing children.

Duration analyses

We first examine the nonparametric Kaplan Meier survivor function (Figure 1a-c) examining the curves separately for individuals in states with high and low tax rates. Figures 1a, lb, and 1c show the survivor function for beer, wine, and liquor taxes respectively. In the first quarter the empirical survivor function is obtained by calculating one minus the proportion who leave foster care. More generally, the survivor function each quarter is the product of one minus the exit proportion, i.e., the proportion who leave foster care among those still in foster care in a given quarter, over the number of quarters to date. In Figures 1a-c, states with high tax rates are those with rates at the 75^{th} percentile or above, while states with low tax rates are those below the 25^{th} percentile. As predicted, the higher line reflects the higher survivor rates for individuals in states with lower tax rates, meaning more individuals stay in foster care each quarter than in high tax states. The lower line represents the quarterly survivor estimate in states with higher tax rates. The figures also illustrate that the exit rates are high initially and fall rapidly during the first few quarters. In each figure, the overall trends appear to be proportional in high and low tax states although the differences decline over time.

The effects of the determinants of foster care duration are reported in Tables 5 and 6. In

Table 5, columns 1-3 include all observations, columns 4-6 include only children entering foster care due to parental alcohol abuse, while columns 7-9 include only children in foster care due to their own alcohol abuse. Columns 1, 4, and 7 include the excise tax on beer, columns 2, 5, and 8 include the wine tax among license states only and columns 3, 6, and 9 shows liquor taxes among the license states only. We show the results of the license states only for brevity. Results with the imputed values are similar and are available upon request. Table 6 includes the ACCRA prices instead of the taxes. The tables show the hazard ratios and t-statistics associated with the coefficients. Values of hazard ratios greater than one indicate that the covariate increases the exit probability and, therefore, decreases the time to leaving foster care, while values less than one increase the time to exit.

We find that the exit rate from foster care increases with alcohol taxes in the all-cause models and in the models with parents who abuse alcohol (Table 5). In other words, our analysis provides evidence that once children have been removed from the home, parents become more responsive to alcohol taxes and, thus, their children are able to exit foster care more quickly. The exit rate for children with their own alcohol abuse, however, does not increase with higher taxes. However, once children are in the foster care system, they may be monitored much more closely, diminishing their ability to purchase alcohol, which results in no effects of alcohol taxes on the exit rate for alcohol abusing children. Table 5 also shows that access to alcohol in the form of more outlets licensed to sell liquor are associated with lower hazard rates (longer time spent in care), but only in the all cause models. Again, alcohol abusing children are not responsive to this availability measure, likely because of the supervision.

Table 6 includes results for the models with the ACCRA prices rather than excise taxes. There is limited evidence here that alcohol prices matter, as the signs and statistical significance

vary depending on the type of alcohol and the dependent variable under consideration. However, higher beer prices are associated with faster exit times for all three causes but the effect is statistically significant only for the all cause model and for alcohol abusing children. Wine prices also have a positive effect, but here the effect is statistically significant only for the alcohol abuse parent models. The liquor price has a contradictory negative effect in two of the models. It is not clear why this would occur, but we note that the magnitude of the effect is small. Lastly, as in Table 5, liquor outlets are associated with lower hazard rates in the all cause models.

In terms of demographic variables, males have lower hazard rates, except among children who abuse alcohol where results are not statistically significant. Ethnic and racial minorities have lower hazard rates (longer lengths of stay) and these results are statistically significant across specifications. Having a disability works in a similar direction with lower hazard rates for children with disabilities. In contrast, older children have higher hazard rates, but of course they may age out of the system more quickly.

6. Conclusions

This paper seeks to evaluate whether policies that increase the full price of alcohol can be effective in reducing the maltreatment of children as measured by entry into foster care and the duration of stay in care. We consider taxes and prices of beer, wine, and liquor. A composite price and tax for pure ethanol are also used. To represent the availability of alcohol, we include the per capita number of outlets licensed to sell liquor.

We first examine the determinants of entry into foster care, but find that higher taxes and prices of beer, wine, liquor, and ethanol are not effective in reducing these entry rates. These

results are a bit surprising given that other research such as Markowitz, Grossman and Conrad (2010) find that taxes and prices can reduce the incidence of child maltreatment. There is limited evidence that the entry rates of alcohol abusing children may be reduced with higher alcohol taxes, but this result does not hold if prices are used instead of taxes. Further research should be conducted before firm conclusions are drawn with regards to these entry rates.

However, once in foster care, the duration of stay may be shortened with higher taxes, particularly when the entry was a result of an alcohol abusing parent, and these results are confirmed by the alcohol prices. For example, the estimated hazard ratio of the wine excise tax is 2.3, but a one unit increase would virtually double the mean wine tax. Separately, we estimated predicted survival after one year if the wine tax were increased by 25 cents. The predicted mean survival is 74.5 percent at one year, but drops to 69.6 percent with a 25 cent increase in the wine tax, holding all other variables at their actual values. In cases with an alcohol abusing parent, the predicted mean survival at six months drops from 79.1 percent to 70.2 percent with a 25 cent increase in the wine tax. For beer taxes, a 25 cent increase in the tax is associated with a change in the one-year survival rate from 75.6 percent to 53.6 percent for all cases, and for liquor -- which has a much higher mean and a smaller estimate hazard ratio– the predicted change is from 75.3 percent to 74.3 percent.

We do not find much evidence that the availability of alcohol as measured through outlets will be helpful in improving the lives of children. We do find that fewer outlets are associated with reduced foster care entry rates alcohol abusing children, but not for entry of other reasons. We also find that fewer outlets licensed to sell liquor are associated with reductions in the duration of time in foster care for all causes, but again, this result is challenged by the lack of effectiveness where we would expect to find stronger results, in the alcohol abuse models. The

effectiveness of restrictions on alcohol outlets to reduced foster care entry and duration is limited at best.

This research highlights the challenges faced by children, families and the child protection agencies who help them. Overall, alcohol tax policies appear to have some ability to alter foster care entry rates and duration once in care. Those most responsive to the taxes are children and the parents whose children have been removed.

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Figure 1a

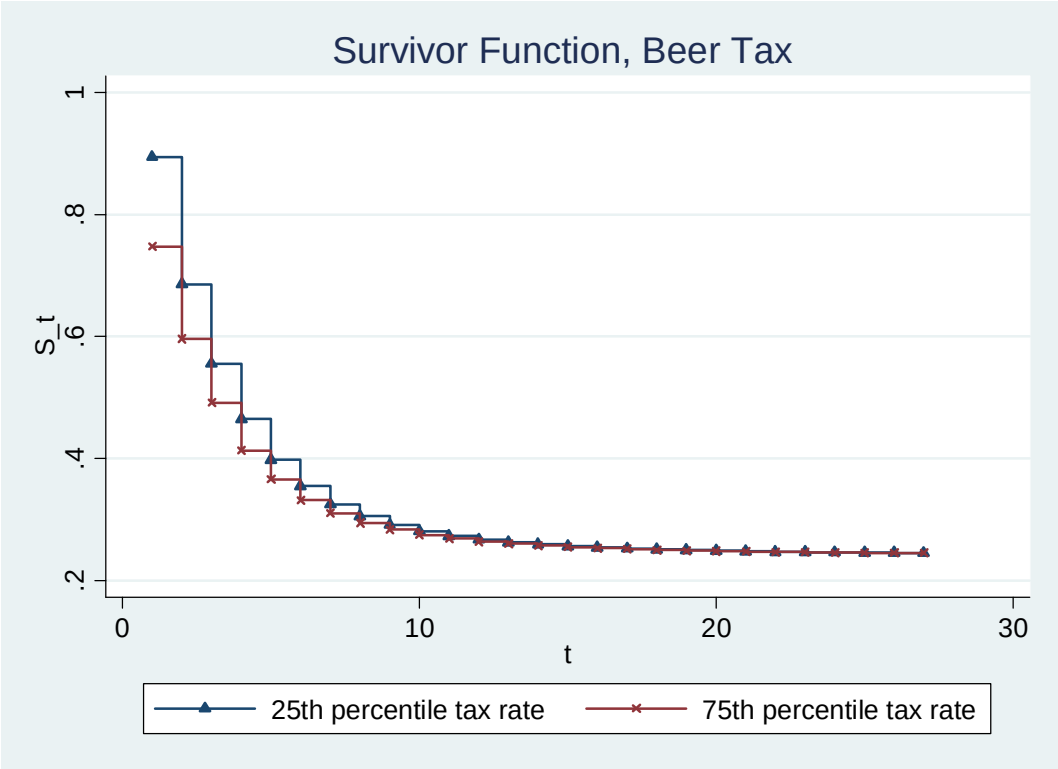


Figure 1b

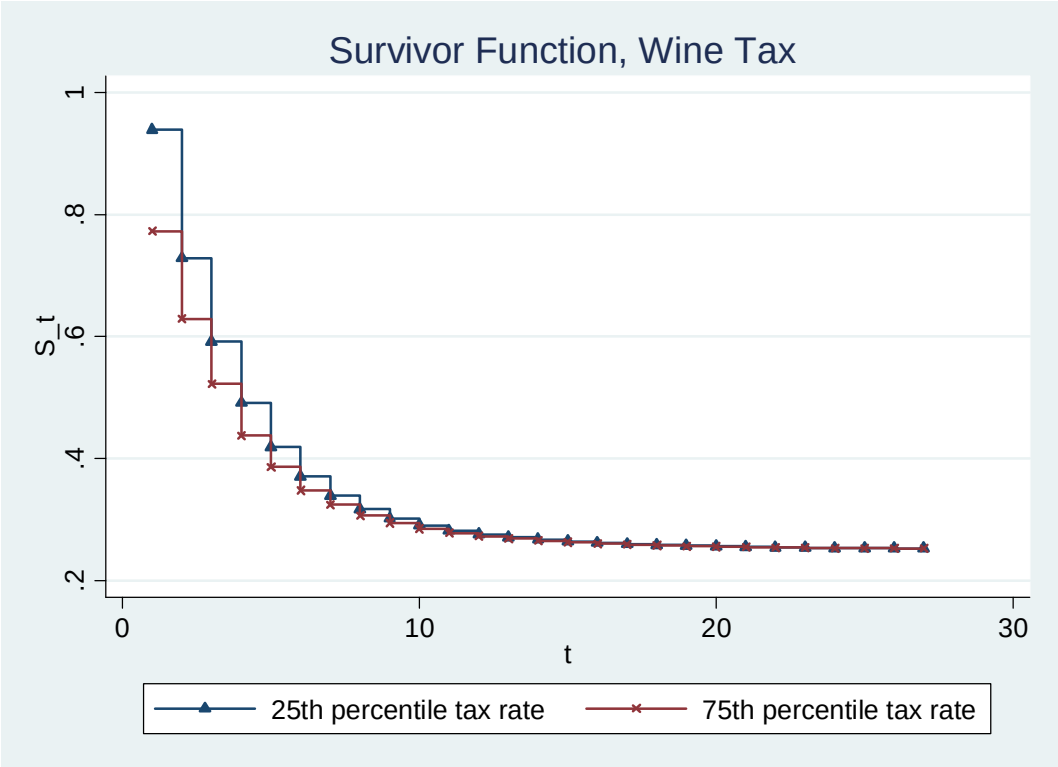
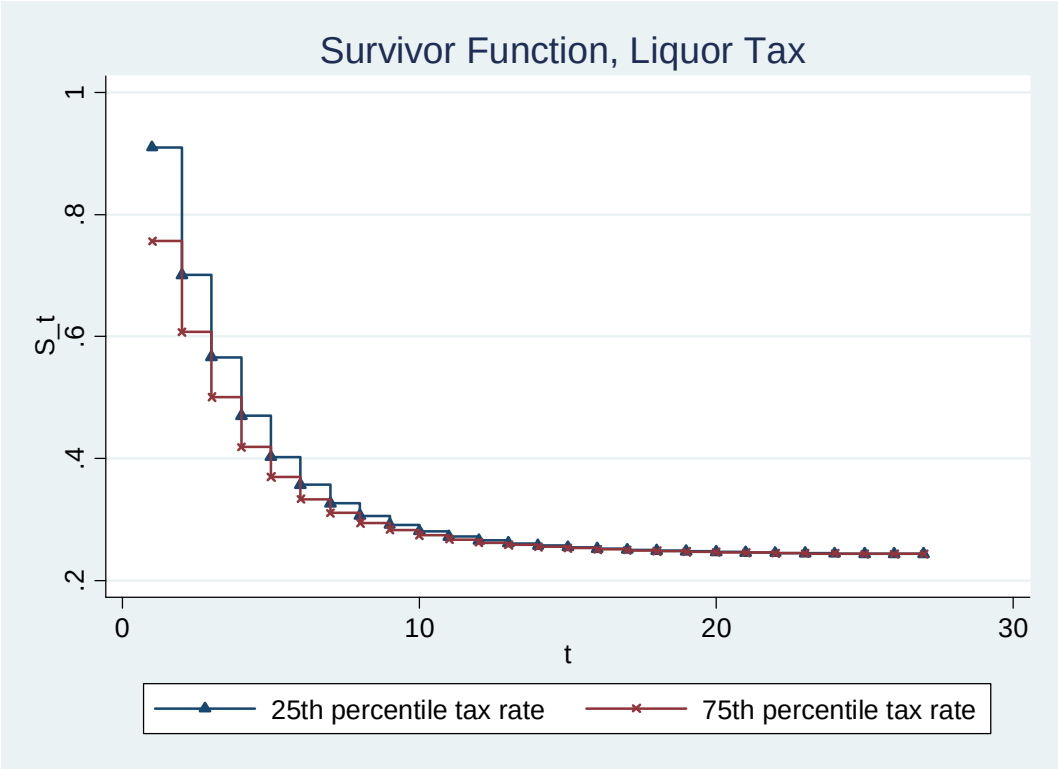


Figure 1c


Survivor Function, Liquor Tax
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25th percentile tax rate
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Table 1: Summary Statistics

	Quarterly, 1998-2004 (N=1,341)			
	Mean	Std. Dev	Min	Max
Foster care entries count	1776.13	2177.36	110.00	15412.00
Foster care entries rate per 1,000 children	1.40	0.71	0.35	7.25
FC entry, parent alcohol abuse count	157.79	253.97	0	1752.00
FC entry, parent alcohol abuse per 1,000 children	0.14	0.24	0	2.12
FC entry, child alcohol abuse count	26.06	49.27	0	554.00
FC entry, child alcohol abuse per 1,000 children	0.02	0.04	0	0.41
Length of time (quarters) in foster care, all causes	10.26	8.16	1	27
Beer tax	0.47	0.11	0.32	0.93
Wine tax	1.06	0.30	0.62	2.05
Liquor tax	8.93	1.42	6.49	13.12
Ethanol tax	0.11	0.02	0.08	0.18
Beer price	2.62	0.29	1.67	3.42
Wine price	3.30	0.49	1.93	4.52
Liquor price	11.53	1.46	7.11	15.36
Ethanol price	0.82	0.10	0.50	1.06
Liquor outlets per 100,000 state population	124.70	62.41	13.27	398.14
Child welfare spending per child population	288.84	236.09	60.35	2099.27
College education	25.78	5.11	15.30	46.40
Female labor force participation rate	61.20	4.26	47.70	71.20
Real income (in $1,000s)	16.51	2.66	11.99	27.58
Unemployment	4.78	1.20	2.20	8.80
Percent rural	27.66	15.13	0	62.90
Mormon	2.97	9.69	0.09	67.21
Southern Baptist	6.89	9.47	0.11	32.47
Catholic	19.84	12.21	3.13	53.72
Protestant	18.45	8.67	2.82	44.68
	Person Level (N=462,923)			
	Mean	Std. Dev	Min	Max
Number of quarters in foster care	10.26	8.16	1	27
Number of quarters in foster care, alc abusing parent	10.81	8.12	1	27
Number of quarters in foster care, alc abusing child	9.07	8.06	1	27
Male	0.52	0.50	0	1
Hispanic	0.14	0.35	0	1
Ethnicity missing	0.13	0.34	0	1

Black	0.25	0.43	0	1
Race missing	0.18	0.38	0	1
Age at entry	7.75	5.58	0	18
Disability	0.14	0.35	0	1
Disability missing	0.08	0.26	0	1

Note: All monetary variables expressed in real (1982-1984) dollars.

Table 2
Foster Care Entry Rates, Log-linear Models

	Tax Included					Price Included		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Beer tax/price	-0.192					0.018		
	(-0.17)					(0.19)		
Wine tax/price		-0.295	-0.182				-0.079	
		(-0.61)	(-0.55)				(-1.64)	
Liquor tax/price				-0.068	-0.023			-0.011
				(-0.83)	(-0.63)			(-0.39)
Liquor outlets	-0.001	-0.001	-0.001	-0.002	-0.001	-0.001	-0.001	-0.001
	(-1.14)	(-0.99)	(-1.19)	(-2.68)	(-1.23)	(-0.98)	(-0.93)	(-0.97)
Child welfare spending	0.0002	0.0003	0.0002	0.0001	0.0002	0.0004	0.0004	0.0004
	(0.74)	(0.84)	(0.85)	(0.36)	(0.75)	(1.17)	(1.42)	(1.23)
College education	0.012	0.010	0.011	0.014	0.013	0.011	0.010	0.011
	(0.93)	(0.78)	(0.88)	(0.93)	(0.98)	(0.83)	(0.72)	(0.86)
Female LFP	0.024	0.024	0.024	0.002	0.023	0.024	0.026	0.025
	(1.76)	(1.64)	(1.79)	(0.12)	(1.70)	(1.73)	(1.93)	(1.88)
Real income	0.046	0.055	0.044	0.054	0.045	0.049	0.047	0.047
	(0.85)	(1.03)	(0.82)	(0.98)	(0.85)	(0.91)	(0.91)	(0.92)
Unemployment	-0.028	-0.014	-0.028	-0.015	-0.031	-0.009	-0.008	-0.009
	(-1.04)	(-0.47)	(-1.02)	(-0.44)	(-1.14)	(-0.37)	(-0.30)	(-0.33)
Percent rural	-0.017	0.021	-0.012	-0.002	-0.010	-0.009	-0.013	-0.011
	(-0.41)	(0.56)	(-0.30)	(-0.03)	(-0.23)	(-0.22)	(-0.30)	(-0.25)
Mormon	-0.087	-0.749	-0.109	-0.974	-0.076	-0.114	-0.145	-0.117
	(-0.85)	(-3.11)	(-0.83)	(-2.15)	(-0.73)	(-1.00)	(-1.27)	(-1.05)
Southern Baptist	-0.128	-0.124	-0.125	-0.139	-0.134	-0.152	-0.161	-0.153
	(-1.45)	(-1.44)	(-1.43)	(-1.63)	(-1.52)	(-1.76)	(-1.84)	(-1.77)
Catholic	0.004	-0.017	-0.001	-0.033	0.001	0.014	0.012	0.011
	(0.12)	(-0.55)	(-0.03)	(-0.93)	(0.03)	(0.41)	(0.38)	(0.32)
Protestant	-0.012	-0.028	-0.013	0.016	-0.010	-0.019	-0.020	-0.020
	(-0.30)	(-0.86)	(-0.35)	(0.35)	(-0.28)	(-0.50)	(-0.54)	(-0.54)
N	1341	1264	1313	863	1292	1228	1228	1228
Tax/price elasticity	-0.090	-0.305	-0.192	-0.563	-0.207	0.046	-0.261	-0.129

Note: t-statistics in parentheses and intercept not shown. All models include year, quarter and state fixed effects. The sample in Columns 2 and 4 includes only the license states. The samples in Columns 3 and 5 include all states and imputed values for the states with government run stores. Standard errors are clustered by state.

Table 3
Foster Care Entry Rates: Reason Parental Alcohol Abuse
Log-linear Models

	Tax Included					Price Included		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Beer tax/price	-0.934					0.058		
	(-0.18)					(0.25)		
Wine tax/price		1.178	0.117				0.006	
		(0.78)	(0.27)				(0.05)	
Liquor tax/price				0.623	-0.123			-0.057
				(1.59)	(-1.87)			(-1.22)
Liquor outlets	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.002
	(0.61)	(0.75)	(0.60)	(0.14)	(0.46)	(0.63)	(0.64)	(0.70)
Child welfare spending	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001
	(0.93)	(1.37)	(0.95)	(-0.23)	(0.95)	(1.34)	(1.39)	(1.45)
College education	-0.042	-0.043	-0.042	-0.026	-0.037	-0.043	-0.044	-0.044
	(-2.05)	(-2.14)	(-2.10)	(-1.15)	(-1.83)	(-2.07)	(-2.04)	(-2.14)
Female LFP	0.006	0.015	0.007	-0.028	0.007	0.006	0.006	0.009
	(0.22)	(0.49)	(0.26)	(-0.81)	(0.23)	(0.21)	(0.22)	(0.30)
Real income	-0.123	-0.139	-0.132	0.003	-0.118	-0.113	-0.115	-0.119
	(-0.96)	(-1.00)	(-1.05)	(0.02)	(-0.99)	(-0.87)	(-0.88)	(-0.95)
Unemployment	-0.029	-0.045	-0.033	-0.076	-0.042	-0.023	-0.020	-0.024
	(-0.50)	(-0.78)	(-0.57)	(-0.97)	(-0.72)	(-0.40)	(-0.35)	(-0.41)
Percent rural	0.142	0.110	0.145	0.169	0.144	0.145	0.148	0.136
	(1.89)	(1.32)	(1.91)	(1.02)	(1.82)	(1.91)	(1.85)	(1.65)
Mormon	0.025	-0.722	0.054	1.262	0.070	0.015	0.012	-0.005
	(0.22)	(-0.33)	(0.38)	(0.63)	(0.62)	(0.12)	(0.09)	(-0.04)
Southern Baptist	0.393	0.407	0.387	0.173	0.353	0.330	0.331	0.329
	(1.66)	(1.70)	(1.59)	(0.56)	(1.47)	(1.34)	(1.34)	(1.36)
Catholic	-0.216	-0.242	-0.216	-0.125	-0.210	-0.215	-0.217	-0.227
	(-3.92)	(-2.69)	(-3.95)	(-1.26)	(-4.14)	(-3.74)	(-3.65)	(-3.85)
Protestant	-0.174	-0.197	-0.180	-0.024	-0.164	-0.161	-0.163	-0.170
	(-2.13)	(-2.65)	(-2.32)	(-0.19)	(-2.17)	(-2.00)	(-2.05)	(-2.20)
N	1206	1129	1178	782	1157	1093	1093	1093
Tax/price elasticity	-0.443	1.232	0.125	5.070	-1.085	0.153	0.020	-0.660

Note: t-statistics in parentheses and intercept not shown. All models include year, quarter and state fixed effects. The sample in Columns 2 and 4 includes only the license states. The samples in Columns 3 and 5 include all states and imputed values for the states with government run stores. Standard errors are clustered by state.

Table 4
Foster Care Entry Rates: Reason Child Alcohol Abuse
Negative Binomial Count Models

	Tax Included					Price Included		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Beer tax/price	-16.839					-0.144		
	(-1.73)					(-0.41)		
Wine tax/price		-9.188	-0.816				-0.124	
		(-2.09)	(-0.63)				(-0.65)	
Liquor tax/price				-0.972	-0.305			-0.095
				(-1.66)	(-1.94)			(-1.24)
Liquor outlets	0.006	0.005	0.005	0.015	0.011	0.011	0.011	0.011
	(1.02)	(1.04)	(0.93)	(3.68)	(2.25)	(1.92)	(1.94)	(1.94)
Child welfare spending	0.001	0.001	0.001	0.0005	0.001	0.001	0.001	0.001
	(1.26)	(1.60)	(1.12)	(0.72)	(0.76)	(1.02)	(1.07)	(1.03)
College education	-0.009	-0.012	-0.013	0.010	0.004	-0.012	-0.012	-0.010
	(-0.29)	(-0.39)	(-0.42)	(0.39)	(0.12)	(-0.37)	(-0.36)	(-0.31)
Female LFP	0.045	0.049	0.041	0.040	0.050	0.053	0.053	0.054
	(1.28)	(1.31)	(1.22)	(0.86)	(1.49)	(1.52)	(1.51)	(1.57)
Real income	-0.063	-0.054	-0.089	-0.049	-0.090	-0.142	-0.143	-0.154
	(-0.46)	(-0.39)	(-0.64)	(-0.27)	(-0.66)	(-1.06)	(-1.00)	(-1.07)
Unemployment	0.004	0.044	0.007	-0.041	-0.021	-0.005	-0.007	-0.010
	(0.04)	(0.48)	(0.07)	(-0.30)	(-0.23)	(-0.05)	(-0.08)	(-0.11)
Percent rural	0.077	0.165	0.092	0.125	0.190	0.195	0.188	0.176
	(0.44)	(0.92)	(0.54)	(0.59)	(1.04)	(1.04)	(0.98)	(0.91)
Mormon	0.113	-2.850	0.114	-3.876	0.278	0.143	0.097	0.140
	(0.67)	(-1.96)	(0.45)	(-3.38)	(1.27)	(0.70)	(0.48)	(0.72)
Southern Baptist	0.371	0.577	0.249	0.367	0.240	0.250	0.243	0.265
	(1.23)	(1.94)	(0.81)	(1.12)	(0.78)	(0.77)	(0.75)	(0.83)
Catholic	-0.085	-0.183	-0.062	-0.088	-0.052	-0.073	-0.070	-0.074
	(-1.25)	(-1.89)	(-0.90)	(-1.29)	(-0.90)	(-0.64)	(-0.61)	(-0.64)
Protestant	0.160	-0.005	0.125	0.027	0.154	0.138	0.137	0.135
	(1.24)	(-0.04)	(0.99)	(0.15)	(1.14)	(1.08)	(1.09)	(1.08)
N	1179	1102	1151	755	1130	1084	1084	1084
Tax/price elasticity	-7.833	-9.539	-0.865	-7.859	-2.683	-0.380	-0.411	-1.098

Note: t-statistics in parentheses and intercept not shown. All models include year, quarter and state fixed effects. The sample in Columns 2 and 4 includes only the license states. The samples in Columns 3 and 5 include all states and imputed values for the states with government run stores. Standard errors are clustered by state.

Table 5
Proportional Hazard Models with Taxes

	All Cause			Parent Alcohol Abuse			Child Alcohol Abuse		
	Beer (1)	Wine (2)	Liquor (3)	Beer (4)	Wine (5)	Liquor (6)	Beer (7)	Wine (8)	Liquor (9)
Tax	27.266	2.242	1.254	243.269	5.758	0.848	71.739	1.325	1.278
	(16.43)	(10.12)	(13.49)	(3.70)	(3.33)	(-1.49)	(1.09)	(0.17)	(0.82)
Liquor outlets	0.999	0.998	0.999	1.000	1.000	1.003	1.002	1.002	0.993
	(-7.00)	(-8.00)	(-6.50)	(-0.50)	(-0.63)	(1.56)	(0.69)	(0.63)	(-1.22)
Male	0.973	0.968	0.973	0.963	0.955	0.962	1.073	1.060	1.022
	(-5.29)	(-6.06)	(-4.41)	(-2.08)	(-2.44)	(-1.65)	(1.65)	(1.21)	(0.38)
Hispanic	0.961	0.952	0.949	0.949	0.947	0.909	0.883	0.862	0.857
	(-4.66)	(-5.49)	(-5.35)	(-1.66)	(-1.65)	(-2.50)	(-1.73)	(-1.72)	(-1.61)
Ethnicity missing	0.891	0.886	0.940	0.956	0.965	0.935	0.886	0.851	0.719
	(-12.64)	(-13.03)	(-5.32)	(-1.30)	(-1.01)	(-1.27)	(-1.38)	(-1.71)	(-2.44)
Black	0.887	0.891	0.861	0.808	0.811	0.770	0.577	0.571	0.588
	(-18.40)	(-17.03)	(-19.14)	(-8.23)	(-7.78)	(-7.74)	(-7.89)	(-7.43)	(-6.00)
Race missing	0.616	0.627	0.601	0.455	0.449	0.479	0.742	0.831	0.884
	(-53.82)	(-50.76)	(-47.55)	(-24.34)	(-23.56)	(-17.95)	(-4.02)	(-2.21)	(-1.30)
Age at entry	1.024	1.022	1.023	1.016	1.014	1.014	1.046	1.045	1.063
	(47.80)	(44.00)	(37.50)	(8.72)	(7.32)	(5.75)	(8.90)	(8.22)	(9.29)
Disability	0.835	0.841	0.838	0.805	0.789	0.842	0.905	0.927	1.087
	(-23.49)	(-21.71)	(-19.20)	(-7.97)	(-8.25)	(-4.85)	(-1.90)	(-1.31)	(1.22)
Disability missing	0.883	0.885	0.741	0.880	0.875	0.354	0.786	0.788	1.000
	(-3.93)	(-3.88)	(-1.92)	(-1.23)	(-1.28)	(-1.47)	(-0.76)	(-0.75)	(0.00)
Female LFP	0.946	0.951	0.938	0.941	0.937	0.915	1.020	1.035	1.057
	(-16.91)	(-14.85)	(-15.33)	(-5.19)	(-5.37)	(-5.42)	(0.70)	(1.16)	(1.44)
Unemployment	0.923	0.923	0.893	0.910	0.894	0.825	1.073	1.078	0.956
	(-17.33)	(-17.52)	(-19.22)	(-5.49)	(-6.61)	(-8.00)	(1.62)	(1.66)	(-0.70)

Real income	0.829 (-17.50)	0.836 (-16.74)	0.831 (-15.02)	0.727 (-7.35)	0.691 (-8.57)	0.649 (-7.78)	0.935 (-0.59)	0.882 (-1.04)	0.831 (-1.22)
Percent rural	1.015 (1.61)	0.975 (-2.80)	0.857 (-9.77)	1.113 (3.34)	1.080 (2.09)	1.040 (0.66)	1.021 (0.26)	1.093 (0.92)	0.923 (-0.50)
College education	1.037 (14.40)	1.034 (13.40)	1.022 (7.16)	1.036 (3.79)	1.039 (3.96)	1.001 (0.08)	1.000 (-0.01)	1.013 (0.64)	0.977 (-0.87)
Mormon	1.231 (7.17)	1.858 (7.57)	5.147 (10.95)	1.269 (3.50)	3.771 (2.36)	5.601 (2.44)	1.238 (1.89)	0.486 (-0.58)	3.786 (0.65)
Baptist	1.189 (9.04)	0.967 (-4.17)	1.122 (5.46)	1.825 (7.37)	1.892 (7.55)	2.182 (7.87)	0.847 (-0.82)	0.900 (-0.50)	0.907 (-0.43)
Catholic	0.987 (-2.58)	0.994 (-1.07)	1.103 (12.78)	0.853 (-6.59)	0.868 (-5.05)	0.928 (-2.19)	0.786 (-2.98)	0.776 (-3.05)	0.807 (-2.23)
Protestant	0.920 (-10.11)	1.005 (0.80)	0.976 (-2.13)	0.728 (-8.83)	0.759 (-7.48)	0.733 (-5.52)	1.024 (0.29)	1.044 (0.50)	0.850 (-1.30)
Child welfare spending	0.999 (-9.00)	0.999 (-9.00)	0.999 (-10.00)	0.998 (-5.50)	0.998 (-5.25)	0.998 (-2.83)	0.999 (-0.89)	1.000 (-0.36)	0.999 (-0.40)
N	4,748,273	4,460,148	3,442,760	426,734	394,115	256,192	49,264	42,226	32,362
Ll	-6.00E+05	-5.60E+05	-4.20E+05	-5.00E+04	-4.60E+04	-2.90E+04	-7.80E+03	-6.50E+03	-4.70E+03

Notes: Non-parametric baseline hazard; hazard ratios, t-statistics in parentheses. Models also include state and year/quarter fixed effects. There are 462,923 individuals in the cause models, 39,857 in the parent alcohol models and 5,434 in the child alcohol models.

Table 6
Proportional Hazard Models with ACCRA Prices

	All Cause			Parent Alcohol Abuse			Child Alcohol Abuse		
	Beer (1)	Wine (2)	Liquor (3)	Beer (4)	Wine (5)	Liquor (6)	Beer (7)	Wine (8)	Liquor (9)
Price	1.164	1.015	0.989	1.090	1.096	1.008	1.522	1.160	0.919
	(6.33)	(0.96)	(-1.90)	(1.08)	(1.81)	(0.36)	(2.52)	(1.36)	(-1.67)
Liquor outlets	0.999	0.999	0.999	1.000	1.000	1.000	1.003	1.003	1.002
	(-6.00)	(-6.00)	(-6.00)	(-0.56)	(-0.44)	(-0.56)	(0.82)	(0.82)	(0.58)
Male	0.974	0.974	0.974	0.960	0.961	0.961	1.077	1.077	1.076
	(-5.16)	(-5.14)	(-5.16)	(-2.21)	(-2.20)	(-2.20)	(1.71)	(1.72)	(1.70)
Hispanic	0.955	0.954	0.954	0.948	0.948	0.949	0.882	0.877	0.875
	(-5.30)	(-5.39)	(-5.39)	(-1.68)	(-1.69)	(-1.67)	(-1.73)	(-1.81)	(-1.84)
Ethnicity missing	0.883	0.881	0.882	0.944	0.944	0.944	0.871	0.869	0.870
	(-13.55)	(-13.72)	(-13.63)	(-1.65)	(-1.67)	(-1.66)	(-1.55)	(-1.56)	(-1.55)
Black	0.887	0.887	0.887	0.816	0.815	0.816	0.579	0.574	0.571
	(-18.09)	(-18.20)	(-18.21)	(-7.79)	(-7.82)	(-7.80)	(-7.76)	(-7.92)	(-7.98)
Race missing	0.633	0.633	0.632	0.476	0.475	0.476	0.755	0.750	0.747
	(-50.22)	(-50.31)	(-50.35)	(-22.62)	(-22.61)	(-22.54)	(-3.77)	(-3.86)	(-3.91)
Age at entry	1.024	1.024	1.024	1.016	1.016	1.016	1.046	1.046	1.046
	(47.40)	(47.40)	(47.40)	(8.11)	(8.11)	(8.11)	(8.92)	(8.94)	(8.92)
Disability	0.836	0.836	0.836	0.808	0.808	0.808	0.909	0.911	0.910
	(-23.32)	(-23.32)	(-23.31)	(-7.74)	(-7.75)	(-7.74)	(-1.79)	(-1.76)	(-1.77)
Disability missing	0.864	0.868	0.868	0.874	0.871	0.876	0.743	0.757	0.760
	(-4.60)	(-4.45)	(-4.44)	(-1.30)	(-1.33)	(-1.27)	(-0.94)	(-0.89)	(-0.87)
Female LFP	0.943	0.945	0.945	0.949	0.949	0.949	1.018	1.018	1.027
	(-17.73)	(-17.27)	(-16.50)	(-4.40)	(-4.41)	(-4.34)	(0.64)	(0.62)	(0.93)
Unemployment	0.909	0.910	0.909	0.881	0.885	0.882	1.033	1.047	1.043
	(-20.72)	(-20.52)	(-20.67)	(-8.07)	(-7.75)	(-8.02)	(0.83)	(1.17)	(1.06)

Real income	0.803	0.801	0.798	0.695	0.701	0.692	0.931	0.940	0.903
	(-19.92)	(-20.01)	(-20.53)	(-8.64)	(-8.29)	(-8.73)	(-0.65)	(-0.55)	(-0.91)
Percent rural	1.036	1.039	1.036	1.130	1.132	1.129	0.995	1.014	0.987
	(3.78)	(4.16)	(3.79)	(3.74)	(3.81)	(3.64)	(-0.06)	(0.18)	(-0.17)
College education	1.026	1.024	1.023	1.023	1.023	1.021	1.001	0.998	0.998
	(10.44)	(9.48)	(9.28)	(2.43)	(2.43)	(2.26)	(0.05)	(-0.10)	(-0.11)
Mormon	1.270	1.260	1.256	1.317	1.359	1.309	1.315	1.364	1.276
	(8.12)	(7.81)	(7.79)	(4.01)	(4.28)	(3.94)	(2.49)	(2.65)	(2.22)
Baptist	1.107	1.106	1.103	1.675	1.680	1.672	0.812	0.829	0.850
	(5.26)	(5.19)	(5.07)	(6.17)	(6.21)	(6.15)	(-1.02)	(-0.92)	(-0.79)
Catholic	0.997	0.988	0.986	0.812	0.806	0.810	0.737	0.727	0.742
	(-0.54)	(-2.20)	(-2.58)	(-8.05)	(-8.28)	(-8.18)	(-2.91)	(-3.03)	(-2.87)
Protestant	0.979	0.975	0.974	0.786	0.783	0.786	1.093	1.070	1.069
	(-2.72)	(-3.31)	(-3.33)	(-7.11)	(-7.20)	(-7.11)	(1.18)	(0.89)	(0.89)
Child welfare spending	0.999	0.999	0.999	0.998	0.998	0.998	0.999	0.999	0.999
	(-6.00)	(-7.00)	(-7.00)	(-6.00)	(-6.00)	(-6.00)	(-1.00)	(-1.33)	(-1.22)
N	4,645,973	4,645,973	4,645,973	413,860	413,860	413,860	47,980	47,980	47,980
Ll	-5.90E+05	-5.90E+05	-5.90E+05	-4.80E+04	-4.80E+04	-4.80E+04	-7.60E+03	-7.60E+03	-7.60E+03

Note: Non-parametric baseline hazard; hazard ratios, t-statistics in parentheses. Models also include state and year/quarter fixed effects. There are 462,923 individuals in the cause models, 39,857 in the parent alcohol models and 5,434 in the child alcohol models.

Appendix A
State liquor sales status.

Monopoly States (Markup)	License States (Excise Tax)
Alabama	Alaska
Idaho	Arizona
Iowa	Arkansas
Maine	California
Michigan	Colorado
Mississippi	Connecticut
Montana	Delaware
New Hampshire	District of Columbia
North Carolina	Florida
Ohio	Georgia
Oregon	Hawaii
Pennsylvania	Illinois
Utah	Indiana
Vermont	Kansas
Virginia	Kentucky
Washington	Louisiana
West Virginia	Maryland
Wyoming	Massachusetts
	Minnesota
	Missouri
	Nebraska
	Nevada
	New Jersey
	New Mexico
	New York
	North Dakota
	Oklahoma
	Rhode Island
	South Carolina
	South Dakota
	Tennessee
	Texas
	Wisconsin