



The effectiveness of alcohol control policies on alcohol-related traffic fatalities in the United States

Koyin Chang^a, Chin-Chih Wu^b, Yung-Hsiang Ying^{c,*}

^a Dept. of Healthcare Information and Management, Ming Chuan University, Taoyuan, Taiwan

^b Institute of Asia and Pacific Studies, National Sun Yat-sen University, Kaohsiung, Taiwan

^c Institute of Economics, National Sun Yat-sen University, No. 70 Lian Hai Rd., Kaohsiung, Taiwan

ARTICLE INFO

Article history:

Received 18 April 2011

Received in revised form 27 July 2011

Accepted 17 August 2011

Keywords:

Alcohol-related traffic fatalities

Deterrent theory

Panel GLS model

ABSTRACT

Multiple alcohol control policies have been enacted since the early 1980s to keep drunk drivers off the roads and to prevent more alcohol-related traffic fatalities. In this paper, we analyze nine traffic policies to determine the extent to which each policy contributes to effective alcohol-related fatality prevention. Compared with the existing literature, this paper addresses a more comprehensive set of traffic policies. In addition, we used a panel GLS model that holds regional effects and state-specific time effects constant to analyze their impact on alcohol-related fatalities with two distinct rates: alcohol-related traffic deaths per capita and alcohol-related traffic deaths per total traffic deaths. While per capita alcohol-related traffic deaths is used more often in other studies, alcohol-related traffic deaths per total traffic deaths better reflects the impact of policies on deterring drunk driving. In addition, regional analyses were conducted to determine the policies that are more effective in certain regions. The findings of this study suggest that zero tolerance laws and increased beer taxes are the most effective policies in reducing alcohol-related fatalities in all regions.

© 2011 Elsevier Ltd. All rights reserved.

1. Introduction

The “Drinking and Driving Don’t Mix” initiative has exerted considerable influence through education and legislation in the past quarter century. However, drinking and driving has remained a serious societal problem in the United States. According to the National Highway Traffic Safety Administration (NHTSA), 13,000 deaths occur annually because of drunk driving, which accounted for one-third of total fatal car crashes in 2007. In terms of economic costs, the impacts of drunk driving cost approximately \$51 billion per year in the United States,¹ almost equivalent to the annual gross product of Idaho. To prevent driving after drinking and save more lives, a series of alcohol use deterrence policies were gradually adopted across the United States in the past decades, and the number of deaths caused by alcohol-related car crashes has significantly

decreased.² Therefore, the causal relationship between deterrence policies and the reduction in alcohol-related motor vehicle crash fatalities is of great interest to both policy makers and social scientists.

This paper departs from traditional approaches for investigating the effectiveness of alcohol use deterrence policies by comparing similar but disparate variables. The existing literature has predominantly applied either total traffic fatalities per 100,000 population or alcohol-related fatalities per 100,000 population (ARFR1) as the dependent variable to analyze the impact of various policies (e.g., Freeman, 2007; Young and Bielinska-Kwapisz, 2006; Benson et al., 1999; Wilkinson, 1987; Chaloupka and Laixuthai, 1997; Dee, 1999; Young and Likens, 2000). Others have compared alcohol-related fatalities with non-alcohol-related or total fatalities to estimate the relationship between drunk driving deaths and the related laws and penalties (Voas et al., 2003; Asbridge et al., 2004, 2009; Sen, 2001). In this study, in addition to using ARFR1, we use a similar measure, alcohol-related fatalities per total deaths in traffic crashes (ARFR2), to discuss the effectiveness of policies across the United States. We believe that ARFR1 and ARFR2 are more direct measures of behavior involving alcohol use than the total motor vehicle death rate, and the use of ARFR1 and ARFR2 is superior to the use of the

* Corresponding author.

E-mail addresses: koyin@kchang.net (K. Chang), strawberry0620@gmail.com (C.-C. Wu), yying@mail.nsysu.edu.tw (Y.-H. Ying).

¹ Drunk driving has both direct and indirect economic costs. Levitt and Porter (2001) report that it costs \$8000 per arrest to punish drunk drivers. NHTSA also indicates that drunk driving has continually threatened human safety and property; there have been only 1.4 million arrests out of 159 million drivers who admitted to driving while drunk in 2005.

² The first laws against drunk driving were passed by the governments of New York in 1910 and California in 1911.