The Effect of German Unification on Alcohol-Related Traffic Crashes

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ABSTRACT

The unification of the West and East Germany has provided an interesting natural experiment for studying the relationship between legal and extra-legal factors and drinking-driving crash rates. Prior to unification, both countries had differing drinking-driving legislation and BAC limits. In the former West Germany, the penal code did not allow driving under the influence of alcohol and other drugs; the penalties could be up to 2 years imprisonment or a fine. The BAC limit was .08%. On the other hand, the former East Germany prohibited driving under the influence of any alcohol (BAC = .0%). After the German unification, the zero-BAC law remained in effect until December 31, 1992, after which the .08% law came into effect.

Despite the fact that the .08 law did not come into effect until 1992, the 1990 unification saw a sharp increase in crash rates in the former East Germany, but no similar increase in the former West Germany. Different secondary data sets have been gathered reflecting on the extra-legal factors of moral commitment to the law, group support, economic conditions, alcohol consumption levels, vehicle ownership and kilometers driven. The paper will be presenting the relationships among the various factors and regression analyses will be identifying the extra-legal predictors of the increased alcohol-related crash rates in the former East Germany.

INTRODUCTION

With the unification of the former Federal Republic of Germany (BRD) and the German Democratic Republic (DDR) on October 3, 1990 after the collapse of communism, Federal Chancellor Helmut Kohl promised that although the transformation time might be hard, “nobody will be any worse off than before”. One area that would prove to be a natural experiment would be in the traffic safety arena.

Prior to the unification, both countries had differing drinking-driving laws and blood alcohol concentration (BAC) limits. West Germany’s laws were complicated, with 3 different BAC laws reflecting differing levels of unsafe driving and sanctions. The per se law legislated that nobody could drive under the influence of a BAC of .08% or greater; offenders would be fined and receive licence suspensions for a period between one and six months (Nickel, 1993). The former East Germany’s laws were both simpler and stricter. The BAC limit was .00% and offenders were fined and subjected to licence suspensions up to four weeks (Nickel, 1993; Warnke, 1990).
After the German unification in 1990, the zero-BAC law remained in effect in the former East Germany until January 1, 1993, at which time the .08% BAC law of the former West Germany came into effect.

The potential impact of this new law on the former East Germany would be difficult to assess. Certainly classical deterrence theory would suggest that the increased liberalization of the law should promote a reduced deterrent effect in eastern Germany. Thus one would anticipate that the increased liberalization of the law should promote a reduced deterrent effect in eastern Germany leading to increases in alcohol-related crashes. Yet, Ross, Klette and McCleary (1984, 1992) have shown that in Scandinavia, recent trends towards liberalization and rationalization of the drinking driving laws did not seem to find reduced deterrence. The latest analysis found that the elimination of the mandatory jail sentence actually had beneficial effects on the traffic death rates in both Norway and Sweden (Ross, Klette and McCleary, 1992).

In fact, many have indicated that extra-legal factors play a more predominant role in the determination of drinking-driving behaviour than the legal factors of certainty, severity and celerity of punishment (eg. Berger and Snortum, 1986; Norstrom, 1983; Vingilis, 1990). Factors such as economic conditions, alcohol consumption levels, vehicle kilometres driven have all been shown to impact on drinking-driving behaviour (Colon and Cutter, 1983; Mann et al., 1987; Norstrom, 1983; Smart and Mann, 1987; Vingilis and Mann, 1986; Vingilis et al., 1986; Wagenaar and Streff, 1989; Wilson, 1984).

In recent years, studies of the relationship between economic conditions and traffic crash data have appeared. Partyka (1984), Wagenaar (1984), Mercer (1986), Yasnowski and Luchter (1984) all found that changes in traffic crashes were mediated by changes in travel mileage which was affected by the economy.

Alcohol consumption and related problems have also been assessed. Skog (1986), investigating Norway alcohol consumption data found that long-term economic growth was positively related to alcohol consumption although factors such as alcohol availability and pricing could mediate the effects. Others have observed similar relationships whereby communities which experienced rapid economic expansion, also experienced increased alcohol consumption and related problems (Lantz et al., 1981). Wagenaar and Streff (1989) collected data on multiple indicators of economic conditions, alcohol consumption, vehicle miles travelled and rates per population of fatal crashes in the U.S. The results indicated that economic conditions significantly affected fatal crash rates both directly and indirectly through changes in aggregate alcohol consumption and miles travelled.

The purpose of the present study was to examine the total and alcohol-related crash trends in the two Germanies prior to and after unification, in light of per capita alcohol consumption and per capita vehicle kilometers traveled, and the introduction of the new legislation in the former East Germany in 1993.

**METHOD**

Various data sources were used to obtain yearly times series on: 1) total motor vehicle crashes, fatalities, alcohol-related crashes and fatalities, for both Germanies, (Leipnitz, 1994; Nicodemus, 1994; Statistisches Bundesamt, 1994); 2) per capita alcohol consumption indices for the former East and West Germanies and the united Germany, (World Drink...
Trends, 1994); and 3) vehicle kilometers driven for both Germanies, based on an assessment formula that combines vehicle counts, gasoline sales and number of registered vehicles (Statistisches Bundesamt, 1994).

RESULTS

Figure 1 presents alcohol-related fatal motor vehicle crashes for the former East and West Germanies from 1975 to 1993. As can be seen, both Germanies exhibited a downward trend prior to unification. After unification, alcohol-related motor vehicle fatal crashes continued to decline in the former West Germany, but rose sharply in the former East Germany.

Figure 1
Alcohol-Related Fatal Crashes 1975-93
Western and Eastern Germany Pre- and Post-Unification

Figure 2 shows alcohol-related fatal crashes as a percentage of total fatal crashes for both regions from 1975 to 1993. In the former West Germany the percentages were higher than in the East, but decreased from 23% to 19% over the time period, while in East Germany the percentages were initially lower at 13% but have risen to 23% since unification to West Germany’s former levels.

Figure 3 reflects the vehicle kilometers driven in the two regions from 1985 to 1993. Prior to unification, West Germans were driving at nearly ten times the level of East Germans. When controlling for population, the West German rate was still double the East German rate. In 1985, the per capita rate per 100,000 residents was 240,000 kilometers for East Germany and 590,000 for West Germany. By 1991, the East German rate was 435,000 kilometers and the West German rate was 730,000. As separate population data were not available to us for 1992 and 1993 for the two former Germanies, we cannot provide per capita rates. However, in absolute terms, by 1993 the former East Germans had nearly doubled their rate of driving.
Figure 2
Alcohol-Related Fatal Crashes as Percentages of Fatal Crashes
for Eastern and Western Germany 1975-93

Figure 3
Vehicle Kilometers Driven 1985-93
Western and Eastern Germany Pre- and Post-Unification

Figure 4 presents the per capita consumption of alcohol for both regions. The total liters of pure alcohol consumed per capita is quite similar for both countries. Beer is the most popular drink in both countries, although greater quantities of spirits are drunk in East Germany, while West Germans favoured wine. Data are not available for the east and west.
regions separately after unification. However, an slight upward trend for total alcohol can be observed for the unified Germany.

Figure 4
Alcohol Consumption Per Capita (total in pure litres of alc.) for Former East Germany and Unified Germany 1975-1993

CONCLUSIONS

These time series data are preliminary and need to be subjected to multivariate ARIMA techniques. However, it clear that changes have been occurring in the former East Germany after unification, but well before the liberalization of the drinking-driving legislation. Perhaps the former East Germans were less deterred after unification in anticipation of the liberalization of laws. However, it was not known during this period between 1990 and 1993 exactly what the new laws would be, so it is difficult to assess the East Germans’ moral commitment to the law and expectations for change. Interestingly, a survey carried out in 1992 found the East Germans to have _stronger_ moral commitment to the law. Pfafferott (1993) surveyed the self-reported drinking-driving attitudes and behaviours and found that over 60% of former East Germans reported to never drive under the influence of alcohol, compared to under 30% of the West Germans. This was at the time when the old laws were still in effect. Furthermore, former East Germans were more supportive of tougher enforcement and legislation. Over 90% of eastern Germans favoured more breath tests compared to about 75% of western Germans. In addition, over 80% of eastern Germans supported a lower BAC or a ban on alcohol for drivers compared to under 60% of the western Germans.

Another hypothesis for the increased trend in alcohol-related fatal crashes could be that detection and enforcement of drinking driving increased in the east after unification. Yet the same survey found higher prevalence of being ever breath tested in the east (25%) than in the west (15%). Furthermore, risk perception for likelihood of an alcohol test on a typical
journey was somewhat higher in eastern Germany (75%) than in western Germany (70%). Thus, this survey does not suggest that eastern Germans feel that their risks of detection are lower than western Germans, although with no pre-unification data, it is impossible to determine whether there have been pre-post reductions in risk perception.

One fact is clear; driving exposure for eastern Germans has been increasing substantially. One can notice a sharp increase from 1989, at which point the borders had become much freer. Furthermore, total motor vehicle fatal crashes have been similarly increasing. Economic indicators, except for unemployment rates, have also been positive, showing increases in GNP for Germany which was particularly large for eastern Germany since unification: eastern Germany’s GNP in 1991 was 180.9 and in 1993 had jumped to 275.5 (Statistisches Bundesamt, 1994, personal communication). Data on transportation, road building and improvement and vehicle purchase have also been dramatically increasing in eastern Germany since unification (Klempin, 1993). For example, in 1989 3.9 million vehicles were registered in the East while between 1990-1992, the East registered an additional 3.5 million new and used vehicles. The share of households equipped with a vehicle grew from 54% in 1989 to 80% in 1992.

The positive relationship we see with the economic indicators and total and alcohol-related motor vehicle fatal crashes are consistent with other studies (eg. Wagenaar and Streff, 1989). Any evaluation of the impact of legislative changes will have to account for these extra-legal determinants of drinking-driving behaviour. As more of a post-unification time series is accumulated, our next step will be to subject the data to multivariate ARIMA techniques. Only then will we have a clearer understanding of the role of legal and extra-legal factors in motor vehicle crashes.

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