Traffic Safety Policy in the European Union:
The Role of Interest Groups

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Abstract

This preliminary research examines traffic safety variables that are influencing the behavior of interest groups in the European Union. Utilizing a fixed effects estimation model, this research identifies variables that are influencing traffic deaths in the 15 member states that made up the European Union prior to May 1, 2004. Time series data analyzing the impact of vehicle concentration in member states, unemployment, length of roadways, legal driving blood alcohol levels, speed on roadways, gross domestic product per capita, and alcohol consumption per capita are examined across time in these countries. Further research on this question will investigate how interest groups are altering the relationship between these variables and the dependent variable, traffic fatalities. In turn, future research will investigate the lobbying efforts of interest groups as they attempt to influence traffic safety policy in the European Union.

Introduction

As in most nations, traffic and transport safety is a major concern for the 27 member-states that constitute the European Union (EU). And, while policy makers, legislators, and interest groups have all worked to make transportation in Europe safer, more efficient, and environmentally more "green," serious issues remain for the EU and its member-states as it tries to reduce the number of fatalities that occur on EU roads and motorways each year. The factors contributing to traffic safety, however, are not well researched. In this paper, we examine traffic safety in the EU and those variables that contribute to traffic fatalities.

Trends in traffic fatalities in the EU provide an overview of the problem, and we examine state measures aimed at increasing road safety and reducing fatalities. We then discuss the *European Charter on Road Safety*, a formal statement on road safety signed in Dublin on April 6, 2004. This charter is a key element of the European Road Safety Action Program that has as its goal the reduction of road fatalities in Europe by at least 50% by 2010. Given the goal of this program, we next examine a number of variables that affect the occurrence of traffic fatalities using a cross-sectional time series analysis. While many of our findings are rather straightforward, it becomes clear from our analysis that the factors impacting upon traffic fatalities across the EU are different from those issues that affect traffic fatalities in the United States. We conclude with a discussion of future research as it relates to interest groups in the EU and suggest strategies that might be used by the EU to reach those goals advanced in the European Road Safety Action Program.

Traffic Safety in the EU: An Overview

Traffic crashes, including road, rail, and maritime traffic, claimed about 41,500 lives in the EU in 2000. Of those fatalities, road accidents accounted for 40,812 of these deaths, and more than 1.7 million were injured. While it is important to point out that Europe today is a much safer place to drive than it was thirty, or even ten, years ago,[1] road accidents in the EU remain the prime cause of death for persons under the age of 45, with road safety initiatives and death rates varying widely across the EU 27. Furthermore, figures indicate that many of the Central and Eastern European countries joining the EU on May 1, 2004, actually have had significant increases in their road fatalities since gaining their independence from the Soviet Union in the early 1990s.

(Figure 1 about here)

As indicated in Figure 1, road fatalities have decreased significantly since 1990, with accident fatalities in the EU decreasing from 56,414 in 1990 to 40,812 in 2000, a decrease of nearly 28% in a decade despite an enlargement in 1995 to fifteen countries. As Table 1 shows, the United Kingdom, Sweden, and the Netherlands had the fewest fatalities when standardizing the figures for traffic fatalities per million inhabitants. Greece and Luxembourg are the only countries where the number of road fatalities did not show a downward trend during the decade of the 1990s, with Greece having a rate more that three times those found in the United Kingdom. Overall, the member states vary greatly in terms of current traffic fatality rates and the pattern of change in those rates over time.

(Table 1 about here)

[1] While road traffic in the EU has more than doubled between 1970 and 2000, the number of fatal casualties decreased by 48%. Reasons for this decrease are discussed above.

Why is there so much variation across member-states? Generally speaking, traffic safety is closely correlated with the number of cars in the country and the relative wealth of the country vis-à-vis other EU nations. For instance, beginning in the 1970s, a general downward trend in the number of persons killed in road accidents is obvious in Figure 1. However, this trend did not hold in Greece, Spain and Portugal, countries that made transitions to democracy during this era and that witnessed a rapid increase in the number of cars. Without appropriate traffic infrastructures, and with more vehicles on the road to collide with one another, perhaps a rise in traffic fatalities in these three nations was unavoidable in the short-run.[2]

There is also much variation in the amount of money, research, and development devoted to traffic safety across the EU. Through the use of structural and cohesion funds, the EU has taken steps towards harmonizing traffic safety policy, encouraging higher safety standards in vehicles, better monitoring of the roadworthiness of the vehicle fleet, and improved road design. Still, the EU is constrained by budgetary and political considerations, given the pressures of enlargement upon the former, and the EU's legislative remit in the latter. For example, legislation pertaining to blood alcohol levels, speed limits, and safety belts remain within the policy realm of the member-states, and there is little indicating that the member-states are disposed to surrender this authority even if the political will existed at the EU level to standardize legislation.

The European Road Safety Action Program

Despite being constrained fiscally and politically, the European Commission (EC) has taken steps to reduce the number of road fatalities across the EU. As previously mentioned,

[2] Spain saw a significant decline in the number of traffic fatalities in the early 1990s, as did Portugal from the mid-1990s onwards. Unfortunately, Greece has shown little improvement.

structural and cohesion funding have gone to improve road infrastructures, particularly in member-states in the south of Europe, and the EC has encouraged the standardization of traffic laws and regulations across the EU. It was not until September 2001, however, that the EC made any formal statement on traffic safety. In their White Paper entitled "European Transport Policy for 2010: Time to Decide" the EC's Directorate –General for Energy and Transport highlighted the many challenges facing the EU's transportation network. Forecasts completed by the DG predicted that economic growth and EU enlargement to Central and Eastern Europe would lead to greater mobility of people and goods, increasing traffic by 50% and annually adding more than three million new cars to already congested motorways. This increase would have an impact upon air quality and the environment, increasing carbon dioxide emissions by 50% between 1990 and 2010.

The White Paper contains an action plan of approximately 80 measures that address all modes of transportation. These measures address three major objectives: 1) Shifting the balance between modes of transportation; 2) Eliminating bottlenecks; and 3) Placing users at the heart of transport policy. The groundwork for these measures was laid in June 2001, when the Gothenburg European Council placed breaking the link between economic growth and transport growth at the heart of the EU's sustainable development strategy. However, despite institutional cooperation between the Council and the EC, it remains clear that many – if not most – of the member-states are less than willing to follow EU-wide initiatives, particularly when such initiatives are not mandated through directives and are often viewed as stifling economic growth and mobility.

There is greater cooperation with the EC and the Council from the member-states, however, for those areas of the White Paper that address traffic safety. Though the concern for better traffic safety is varied across the member-states, each nation has grown to better appreciate the impact that traffic fatalities have on their national psyche and economy. In addition to the 40,000 traffic fatalities and 1.7 million injuries across the EU15, the EC estimated that the direct and indirect costs to member-states amounted to more than €160 billion in 2000, a full two percent of the EU's GNP. Pressure groups, parties, and elected officials have encouraged their governments to adopt the harmonization initiatives proposed by the EU to reduce traffic fatalities. These initiatives include standardizing controls and signage, stiffening and harmonizing penalties for traffic infractions across the EU between now and 2005, the sharing of best practices, and creating an EU-wide training curriculum for drivers (Lamoureux, 6: 2002).

Signed on April 6, 2004, the *European Charter on Road Safety* is a key component of the EC's European Road Safety Action Program designed to decrease the number of road deaths in Europe by at least 50% by 2010. The charter was signed by 39 organizations representing industry, road user representative bodies, and other private and public organizations (EU press release, 1: 2004). By signing, the 39 organizations pledge to pursue road safety goals set out by the EC and to a range of safety objectives and practical measures spelled out in the White Paper. As touched upon above, initiative areas include driving training, vehicle development, new roadway and other infrastructure design, the development and implementation of new technologies designed to reduce the consequences of accidents, and the development of uniform and continuous monitoring of driver and member-state compliance with traffic rules (EU press release, 2: 2004).

Data and Methods

To test whether traffic safety policies reduce traffic fatalities in the EU15, we developed a cross-sectional time series model. Due to constraints on reliable data from the EU and the

OECD, traffic fatalities in the EU15 are examined for the years 1995 to 2006. The dependent variable – the number of traffic fatalities in member states during these years – is examined through eight independent variables. These independent variables are: vehicle concentration in member states, unemployment rate by percentage, length of roadways, legal driving blood alcohol levels, speed on rural roadways, speed on highways, gross domestic product per capita, and alcohol consumption per capita are examined across time in the EU15.

Governments can use a variety of policies to shape driving behavior and reduce fatalities, but we are primarily interested in the impact of road infrastructure, the allowed maximum speed limits on these roads, alcohol policy, and consumption of alcohol. It is widely accepted that higher speeds can increase the severity of crashes (Bowie and Walz 1994; Garber and Graham 1990; Moore, Dolinis and Woodward 1995), but the evidence on the impact of higher speed limits on U.S. traffic fatality rates is mixed. Several studies have shown that the adoption of the 55-mph speed limit in 1974 reduced the number of traffic fatalities (Meier and Morgan 1981; Kamerud 1988; Chirinko and Harper 1993), but the results have been less clear for speed limit increases in the 1990s. Aggregate national analyses of the increase to a 65-mph limit have alternatively shown a significant increase in fatalities on interstates (Baum, Lund and Wells 1989; Baum, Wells, and Lund 1990, 1991), a one-year temporary increase after implementation (Chang, Chen, and Carter 1993), and a decline in the overall state fatality rate due to a diversion of traffic (and corresponding fatalities) from other roads to rural interstates with higher speed limits (Lave and Elias 1994; Houston 1999).

To test for the impact of speed limits, we gathered data on the highest maximum speed allowed on highways and rural motorways. Generally, speed limits on highways are higher than on rural motorways, but more crashes occur in densely populated areas through which highways run, so limits may have an impact. Overall, despite the findings for the 65-mph limit in the U.S., we expect that the higher speeds allowed on EU highways to be associated with higher traffic fatality rates.

The relationship between driving under the influence of alcohol and traffic safety has been well established, and one way to measure this effect is to use a variable for alcohol consumption. Direct measures of alcohol gallons consumed per capita have been positively associated with fatality rates in American states (Chirinko and Harper 1993; Legge and Park 1994; Houston, Richardson and Neeley 1996), and we use a proxy measure of this for the percent of household consumption devoted to alcohol products. This measure could be seen as a control variable, but it also reflects a variety of policy programs designed to reduce consumption and drinking under the influence. We intended to test the impact of various drinking and driving policies, but there was little variation for this small period of time and some problems with identifying older policy changes. We hypothesize that higher rates of alcohol consumption will lead to higher traffic fatality rates.

Closely related to alcohol consumption per capita are the legal limits placed on blood alcohol limits in EU member states. In recent years, many member states have lowered their BAC levels significantly, with zero tolerance in several of the new member states. At the same time, while the EU has encouraged a .5 g/l (grams per liter) BAC level in all member states, other member states such as Ireland, Malta, and the United Kingdom have maintained there level at .8 g/l BAC, while Cyprus is set at .9 g/l BAC. Of course, we hypothesize that higher permitted BAC levels will lead to higher traffic fatality rates.

Our main interest is in the impact of policies, but we also employed a number of control variables that have been significant in similar studies of US traffic safety. It has been hypothesized that states with more densely urbanized populations will have lower fatality rates for a number of reasons, such as availability of mass transit, lower speeds, roads with more safety features, better emergency response systems, and more health care availability. Evidence from the US reveals a negative and significant relationship (Baker, Whitfield and O'Neill 1987; Houston et al 1996). A second control variable is the length of paved roadway in kilometers by member state.

The economy is also a potentially important factor shaping traffic safety, and we used gross domestic product per capita and unemployment as measures of the economy. With higher levels of unemployment, it is hypothesized that fewer individuals will be on the roadways, and thus there will be fewer opportunities for fatal crashes to occur. As a result, we hypothesize that there will be an inverse relationship between unemployment rates as a percentage of the population and the number of fatal accidents..

Another factor affecting traffic safety is the average income of the country. There are rival hypotheses for income with one arguing that it improves traffic safety but the other one arguing that it reduces traffic safety. Some argue that higher income drivers will drive more recklessly knowing they have safer cars, good insurance, and busy lifestyles, but others argue that higher average income allows the purchase of more expensive cars with more safety features. In addition, because we are measuring impacts at the aggregate level, countries with higher income may be able to devote more tax resources to road safety features, and higher income taxpayers may demand more safety features. Studies of American states show that those states with higher average income experience lower fatality rates (Chirinko and Harper 1993; Legge and Park 1994; Houston et al 1996). We use GDP per capita to measure average income, and we expect it to be negatively related with the traffic fatality rate.

Results

The results of the fixed effects estimation model of EU countries for 1995 to 2006 are presented in table 2. with raw results presented in table 3. A cross-sectional time series

(Table 2 about here)

(Table 3 about here)

regression model chi square (not shown) is significant, and the R-square measures from the fixed effects model suggest reasonable fit. Probably due to the short time frame of the data, the model is far better at explaining variation across member states (as shown by the high R-square between) than variation within a country over times (as seen in the small r-square within).

Of the two speed variables, only the maximum speed limit on highways is significant. Higher speed limits on highways contribute to higher traffic fatality rates. Clearly, public officials, advocacy, and interest groups seeking to reduce traffic fatality rates have and effective policy tool available. Alternatively, although higher urban speeds are associated with higher fatality rates in other studies, the relationship in our analysis is neither in the direction expected no is it significant. This finding does not suggest that urban speed limits should be eliminated or eased. Rather, it is likely that the small variation in urban speeds across member states reduces the likelihood of finding significant results.

Another area of potential concern for traffic safety in the EU is the impact of alcohol consumption on traffic fatality rates. The alcohol consumption variable (measures as the percent of household spending) is significant at the .01 level, and the coefficient suggests that each one unit change in alcohol consumption has a large substantive effect on the traffic fatality rate. This significant impact could suggest two things: 1) alcohol consumption in a state reflects cultural and perhaps economic factors that may be the direct but unmeasured effects increasing the traffic fatality rate, or 2) EU member states have not adopted or implemented effective policies to mitigate the impact of alcohol on traffic fatality rates. Considering that there was little variation across countries over the period from 1995 to 2006 for blood alcohol content laws and that they are generally much more stringent than in American states, the issue may be more of a problem with enforcement or with other policies curtailing drinking and driving, such as license revocation or mandatory jail time. Clearly, further research on drinking and driving laws in the EU is needed.

Two control variables were significant. Vehicle congestion, as measured by vehicle density per capita, is significant in the expected direction, suggesting that more vehicles in a member state leads to more traffic fatalities. However, this variable was significant at only the .10 level. Of these two control variables, only GDP per capita was significant at the .05 level or below, which works as hypothesized. States with higher incomes experience lower fatality rates. Surprisingly, the other control variables that work in the American context do not work in the EU

Findings for Research on Interest Groups

The analysis presented here encourages further investigation into the role that interest groups play in the formulation – or lack thereof – of traffic safety policies in the EU. Originally designed to examine the impact that interest groups are having upon traffic safety policy in the EU27, it soon became apparent to us that the scope of the variables originally intended to be examined needed to be reduced. In this process, inconsistencies and inadequate data for the twelve accession members of the EU made it difficult to isolate significant variables, and their relationship to traffic fatalities. As a result, the scope of this research was significantly scaled back to examine those independent variables in the EU15 that are impacting upon traffic fatalities.

While the key findings are presented below, the research presented here does lay the groundwork for future research on the role of interest groups in traffic safety policy in the EU. Interest groups that seek to influence speed limits and alcohol consumption will next be examined to answer two important questions. First, what are the policy ramifications of interest group behavior working in the areas of speed limits and alcohol consumption; and second, how do regional variations in political culture and among political elites influence both interest group behavior and their impact upon the policy process? The data collected here suggests that there are consistent regional variations in attitudes that may contribute to traffic fatalities in individual EU member states. What remains to be seen is whether interest group activity has an influence upon these attitudes. Thus, while the findings of this research are less than we had hoped, we are encouraged that these preliminary findings will help us better understand the relationship between traffic safety in the EU and the tactics of interest groups attempting to shape such policy.

Conclusion

The purpose of this paper was to assess the factors shaping traffic safety in the EU and the role that interest groups have played in shaping traffic safety policies. While the findings regarding the role of interest groups in traffic safety policy was not forthcoming in this preliminary research, it has suggested a number of variables that will be utilized in future research to measure the role of interest groups in advancing, or hindering, traffic safety policies in the EU. Using a fixed affects estimation model of traffic fatalities in the EU for the years

1995 to 2006, we examined the impact of policies and several control variables that have been found to significantly influence traffic safety in American states. We found some similarities, but the differences are interesting too.

An important finding is that maximum speed limits on highways significantly affect traffic safety, and lowering these limits would reduce traffic fatalities. In addition, wealthier member states have lower traffic fatality rates. Although higher speeds on highways are associated with higher fatality rates, maximum speed limits on urban roads were not found to have a significant impact. Another variables that suggests the need for policies but does not test for policy effects is the alcohol consumption variable. More alcohol consumption is significantly related to a higher traffic fatality rate. Overall, if the EU hopes to achieve its goal of reducing fatalities by half by the year 2010, then reducing maximum highway speeds and passing and enforcing laws that reduce drinking and driving must be a part of such a strategy.

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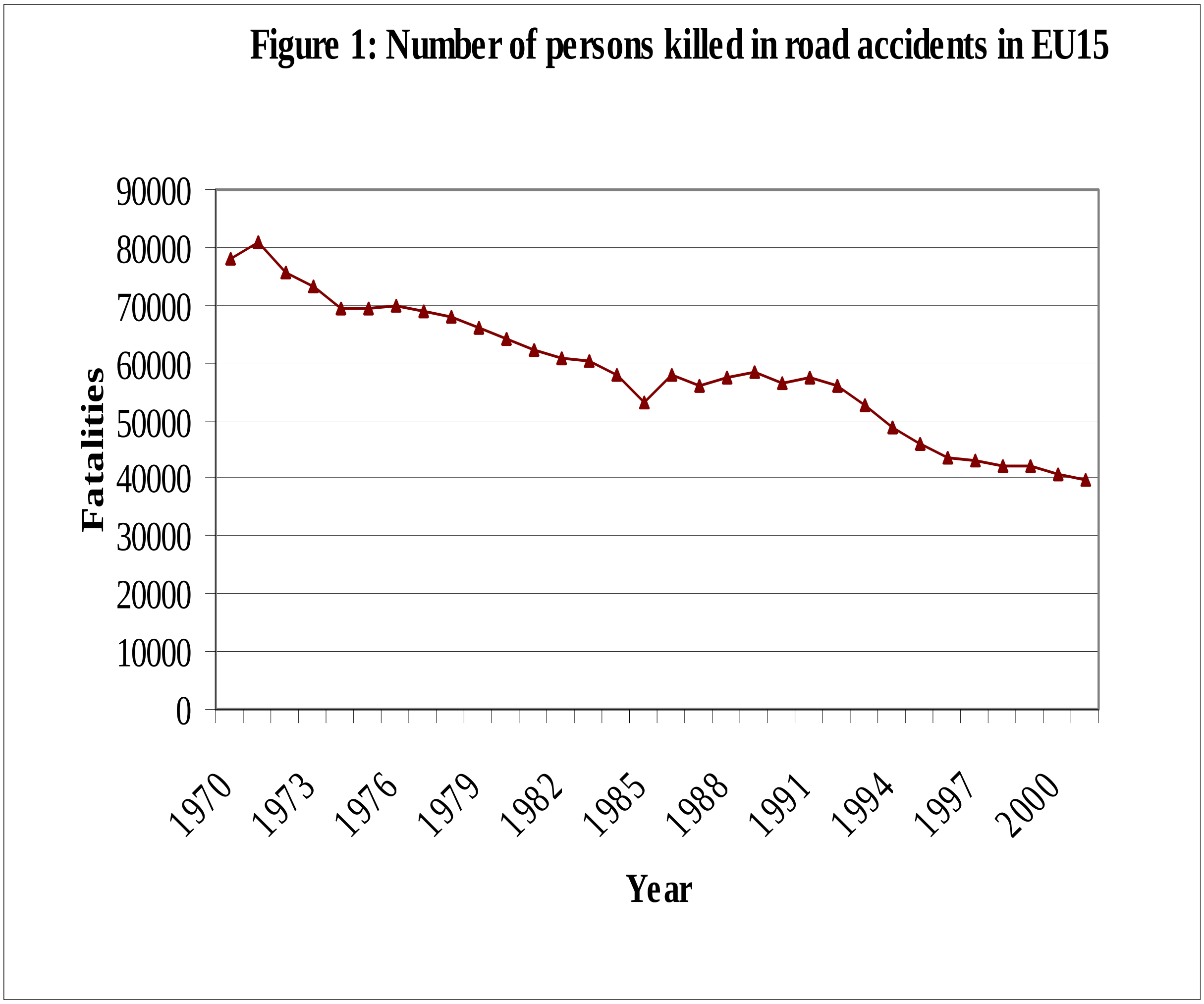
Figure 1: Number of persons killed in road accidents in EU15
Fatalities
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
1970
1973
1976
1979
1982
1985
1988
1991
1994
1997
2000
Year

Table 1: Number of persons killed in road accidents per million inhabitants

	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Belgium	196	143	134	134	147	137	143	144	131	117	112	104
Denmark	123	111	98	93	94	97	98	80	86	80	68	61
Germany	139	116	107	104	95	95	91	85	83	80	71	65
Greece	202	231	206	200	207	210	198	178	159	145	151	145
Spain	232	147	140	142	151	145	145	135	129	128	115	89
France	198	154	147	145	153	145	137	138	128	101	93	88
Ireland	136	121	115	128	123	109	109	107	96	84	94	83
Italy	126	123	116	117	110	115	111	117	117	105	98	90
Luxembourg	186	171	171	143	134	134	174	159	140	118	109	101
Netherlands	92	86	76	75	68	69	68	62	61	63	49	46
Austria	22	150	127	137	119	133	120	119	118	114	108	94
Portugal	305	273	275	253	243	192	181	161	165	148	124	118
Finland	130	86	79	85	78	83	77	83	80	73	72	72
Sweden	90	65	61	61	60	65	67	65	63	59	53	49
United Kingdom	94	64	64	63	60	60	60	63	63	62	57	55
EU15	155	125	118	115	114	111	109	105	104	104	101	100
Index 1990=100	100	80	76	75	74	72	70	69	68	68	66	65

Source: Eurostat and OECD data

Table 2: Fixed effects estimation model explaining the number of traffic fatalities in EU15 member states

	Coefficient	Standard Error
Constant	1183.346	7741.948
Vehicle Density per capita	1.557757*	.9512824
Unemployment as % pop.	-20.51601	14.16409
Length of roadway	-.6474073	.0794002
BAC g/L	-78.79224	485.8409
Speed rural highway	-38.71084	91.06413
Speed highways	28.56131**	14.69098
GDP per capita	-.0354223***	.0089833
Alcohol consumption	1183.346***	7741.948

*** indicates less than .00 probability
** indicates less than .05 probability
* indicates less than .10 probability

R-sq: Within = 0.6239
Between = .8355
Overall = .6689

Table 3: Cross-sectional time series regression model explaining the number of traffic fatalities in EU15 member states (Raw output)

```
Fixed-effects (within) regression               Number of obs      =       224
Group variable: countrynum~r                    Number of groups   =        15
R-sq:  within  = 0.6239                         Obs per group: min =        14
       between = 0.8355                                        avg =      14.9
       overall = 0.6689                                        max =        15
                                                F(8,201)           =     41.68
corr(u_i, Xb)  = -0.9476                        Prob > F           =    0.0000

------------------------------------------------------------------------------
  fatalities |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
roadmotorv~a |   1.557757   .9512824     1.64   0.103    -.3180163     3.43353
unemployment |  -20.51601   14.16409    -1.45   0.149    -48.44529    7.413265
lengthofro~s |  -.6474073   .0794002    -8.15   0.000    -.8039716   -.4908431
   bacglitre |  -78.79224   485.8409    -0.16   0.871    -1036.791    879.2065
speedrural~h |  -38.71084   91.06413    -0.43   0.671    -218.2744    140.8527
speedhighw~h |   28.56131   14.69098     1.94   0.053    -.4069067    57.52952
   gdppercap |  -.0354223   .0089833    -3.94   0.000    -.0531359   -.0177087
  alcconsump |     358.12   55.95445     6.40   0.000      247.787     468.453
       _cons |   1183.346   7741.948     0.15   0.879    -14082.51     16449.2
-------------+----------------------------------------------------------------
     sigma_u |  5053.5962
     sigma_e |  440.34549
         rho |  .99246469   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(14, 201) =    69.03             Prob > F = 0.0000
```