The effects of interstate speed limits on driving speeds: Some new evidence

by

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Abstract

Since the repeal of the 55 mph national maximum speed limit on US interstate highways, speed limits have been raised across the country to as high as 75 mph and more. While many studies have addressed the effects of increased speeds on accident frequency and severity, the factors that determine drivers' choice of speed in the presence of speed limits are still not well understood. This paper provides additional insight into drivers' choice of speed by using a survey of Indiana drivers. The survey is timely since Indiana recently raised speed limits on rural interstates to 70 mph. With urban and suburban areas included, interstate speed limits in the state are now 55 mph, 65 mph and 70 mph. Using seemingly unrelated regression estimation, models of normal interstate driving speeds with low-traffic conditions are estimated for 55 mph, 65 mph and 70 mph speed limits. The results show a wide range of factors (gender, age, income, number of children, age driver is first licensed, assessment of pavement quality, and assessment of vehicle manufacturers) influence individuals' normal interstate driving speed and that the effect of these factors changes as the posted speed limit changes.

Introduction

Since the passage of the Emergency Highway Energy Conservation Act in 1974, which mandated the 55 mph national maximum speed limit on interstate highways in the US, the controversy relating to the effects that speed limits have on observed driving speeds and highway safety has been ongoing. This controversy has been fueled by various research findings and subsequent legislation, such as the National Highway System Designation Act of 1995 that gave states complete freedom to set interstate speed limits. As a result of such legislation, many states have raised rural interstate speed limits from 55 mph to 65 mph, 70 mph, or more.

Although the numbers noticeably vary, almost all research efforts have concluded that the lower 55 mph speed limits have saved lives relative to the return to higher speed limits (*1*, *2*). Some of the most recent work by Kockelman and Bottom (*3*) concluded that a speed limit increase from 55 to 65 mph resulted (on average) in roughly a 3% increase in the accident rate and a 24% increase in the probability of a fatality once an accident occurred. The Kockelman/Bottom study also estimated that speed limit increases from 65 to 75 mph resulted in a lower (relative to the 55 to 65 mph increase) 0.64% increase in the accident rate and in a lower 12% increase in the probability of fatal injury once an accident occurred. The authors speculated that the lower increases from 65 to 75 mph speed limits may have been the result of drivers' heightened awareness of risk at higher speeds or that roads assigned the higher 75 mph in their study's sample may have been inherently safer.

However, not all studies are in agreement that the effect of higher speed limits has caused a decline in safety. One study contended that the legislation-enabled increase from 55 mph to 65 mph actually saved lives due to shifts in law enforcement resources, the ability of higher-speed-limit interstates to attract riskier drivers away from inherently more dangerous non-interstate highways, and possible reductions in speed variances (*4*). With out doubt, there remains considerable uncertainty relating to the true safety impacts of changing speed limits (*5*). The cause of much of this uncertainty relates to the difficulty in empirically controlling the confounding effects of time-varying changes in factors such as highway enforcement, vehicle miles traveled, vehicle occupancy, seat belt usage, alcohol use and driving, vehicle fleet mix (proportions of passenger cars, minivans, pickup trucks, and sport utility vehicles), vehicle safety features (increasing adoption of air bags, antilock brakes, other active safety systems), speed limits on other road classes and in other states, driver expectations, and driver adjustment and adaptation to risk.

The intent of the current study is not to focus on the accident-generating outcomes of increased speed limits, but instead to try to provide insight into the factors that determine drivers' usual speed selection when faced with specific speed limits under low traffic-volume conditions (free-flow conditions as defined by the Transportation Research Board (*6*)). To be sure, previous studies have looked at factors that affect usual driving speeds (*7*). However, this paper differs from previous work in that it considers normally selected driving speeds under a range of speed limits that concurrently exist on interstate highways in the study area. By considering such a range of speed limits on drivers' normally selected speed, it is hoped that some additional insight can be provided with regard to the trade-offs drivers make with regard to speed, safety and the adherence to speed-limit laws.

Effect of Speed Limits on Drivers' Choice of Speed

To understand the effects that speed limits have on drivers' speed choice, some of the principles developed in previous literature relating to risk selection are used (*8*, *9*, *10*). In so doing, drivers are assumed to maximize their utility from driving by trading off driving speed and safety. Figure 1 shows how speed limits can affect the tradeoff between drivers' choice of driving speed and safety. For illustrative purposes, consider safety as the probability of avoiding an accident. Following Winston, Maheshri and Mannering (*10*) in Figure 1, the marginal rate of transformation between safety S and driving speed s is shown by the slope of line Ss (linearity is assumed for simplicity). Given this marginal rate of transformation between safety and speed, and the absence of a speed limit, the driver maximizes utility at equilibrium A (reflecting the tangency of an indifference curve U_0), with S^* and s^* chosen as the optimal levels of safety and driving speed. In the presence of a speed limit below A that is strictly followed, the trade-off between accident likelihood and speed will move to B. However, since B is below drivers' optimal speed selection, drivers will tend toward their optimal speed/safety equilibrium (point A). They trade off the additional utility of driving faster against the risk of detection by law

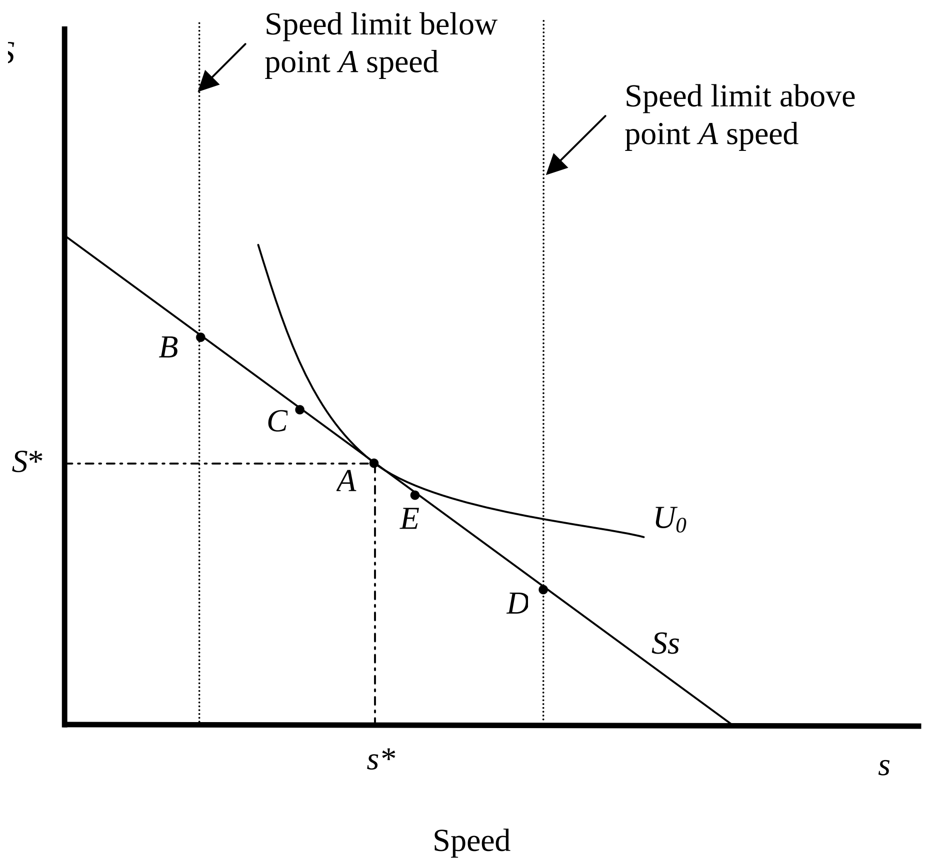

Figure 1. The effect of Speed Limits on Driving Speed.

enforcement, their respect for the law, and so on, resulting in a new equilibrium at point *C*, which is likely to be somewhere between points *A* and *B* for most drivers.

One could also imagine a case where the speed limit is set above point *A* (this may be the case for some older drivers, for example, that might have lower speed equilibrium points). For these drivers, point *D* would be too risky. While one would expect these drivers to still choose point *A*, it is possible that they may try to maintain a higher speed and end up at some point to the left of *A* (such as point *E*).

Given the range of driver abilities, values of time (utility of speed) and acceptance of risk, for any given section of highway and traffic flow conditions there will be a distribution of point *A*'s that will determine the variance of traffic speed. Depending on traffic conditions and driver populations, the imposition of a speed limit will result in new equilibrium points that could increase or decrease this variance.

Please note in the above examples, for purposes of exposition, it is assumed that the slope of *Ss* will remain constant. In fact, the speed selection choices of other drivers in the presence of speed limits may alter risks and change the slope of *Ss*.

Data

Given the discussion relating to Figure 1, the empirical question becomes one of identifying the factors that determine individual drivers' choice of point *C* (or point *E* if speed limits are too high). To study this, a survey was developed and administered to Indiana residents in the late fall of 2005 on the campus of Purdue University. The timing of the survey was particularly relevant since Indiana raised the speed limits on its rural interstates from 65 mph to 70 mph on July 1, 2005. Thus survey respondents had current experience with interstate speed limits set at 55 mph (urban areas), 65 mph (some suburban areas that were not increased to 70 mph) and 70 mph (rural areas).

The survey questions are presented in Table 1. To avoid the interactions of traffic flow and speed, the speed-related questions (Questions 2, 3 and 4) focused on self-reported normal driving speeds on interstate highways (of specified speed limit) with little traffic. As can be seen from Table 1, a broad range of socioeconomic and opinion data were gathered.

The survey was administered to a sample of licensed drivers who indicated they regularly drove on Indiana freeways. The sample consisted of undergraduate and graduate students at Purdue, primarily from engineering disciplines. Because our study is exploratory in nature, no attempt was made to acquire a random sample of Purdue University students (or Indiana drivers). The implication of this will be discussed later in the paper. In all, 250 surveys were administered (most in a classroom environment), and 204 surveys were returned with complete information. Of these 204 respondents, 194 reported normally driving above a 55 mph speed limit, 190 reported normally driving above a 65 mph speed limit, and 178 reported normally driving above a 70 mph speed limit. This would suggest that for the majority of drivers in the survey, the speed limit is to the left of their point *A* (see Figure 1). However, there is also evidence that a small number of survey respondents view the speed limit as being set above their point *A*. Of the 204 respondents, 1 person normally drove below the 55 mph speed limit (9 reported they drive at the 55mph speed limit), 3 people normally drove below the 65 mph speed limit (11 reported they drive at the 65 mph speed limit), and 6 people drove below the 70 mph speed limit (20 reported they drive at the 70 mph speed limit).

Table 1. Survey Questions

1. Indiana recently raised the speed limit on some of its interstate highways from 65mph to 70mph. Do you think this is: □ too fast □ about right □ still too slow
2. On an interstate with a 55 mph speed limit and little traffic, about how fast do you normally drive? ________mph
3. On an interstate with a 65 mph speed limit and little traffic, about how fast do you normally drive? ________mph
4. On an interstate with a 70 mph speed limit and little traffic, about how fast do you normally drive? ________mph
5. How would you rate the quality of pavements on Indiana interstates?
   □ poor □ fair □ good □ very good □ don't know
6. Compared to adjacent states (Ohio, Illinois, Michigan and Kentucky), how would you rate the quality of pavements on Indiana interstates?
   □ worse than adjacent states □ about the same □ better than adjacent states □ don't know
7. Which one of these luxury car brands do you believe has the most prestige? **(select one)**
   □ Acura □ Audi □ BMW □ Cadillac □ Infiniti □ Jaguar □ Lexus □ Lincoln □ Mercedes Benz
8. Which one of these of these vehicle brands do you believe provides the best value for the money? **(select one)**
   □ Chevrolet □ Dodge □ Ford □ Honda □ Hyundai □ Kia □ Mazda □ Nissan □ Toyota
9. Are you? □ female □ male
10. Are you? □ married □ single □ separated □ divorced □ other
11. What is your age? _______
12. What is your highest completed level of education?
    □ some high school □ technical college degree □ post graduate degree
    □ high school diploma □ college degree
13. What is the approximate annual household income of the household you consider home?
    □ no income □ $10,000-$19,999 □ $30,000-$39,999 □ $50,000-$74,999 □ Over $100,000
    □ under $10,000 □ $20,000-$29,999 □ $40,000-$49,999 □ $75,000-$100,000
14. Including yourself, how many people live in the household you consider home? _______
15. How many children, in the household you consider home, are under age 6? _______
16. How many children, in the household you consider home, are aged 6 to 16? _______
17. How many people living, in the household you consider home, work outside the home? _______
18. How many licensed and operable motor vehicles does your “home” household have? _______
19. How many years have you had a driver's license? _______

Summary statistics for the sample are presented in Table 2. This table shows that the reported average normal driving speed was nearly 66 mph on interstates posted with 55 mph speed limits, about 74 mph on interstates posted at 65 mph and almost 78 mph on interstates that are posted at 70 mph. Kockelman and Bottom (*3*) found, with observed speed data from Austin, Texas, that a 5 mph increase in the speed limit was associated with a 3.2 mph increase in average speeds. In the current sample, the observed 3.83 mph increase in normal speeds between 65 mph and 70 mph posted interstates is close to this.

The data indicate that the amount driven above the speed limit declines with higher speed limits (presumably as the speed limit approaches point *A* in Figure 1). In terms of the standard deviations of normal driving speeds, the greatest reported variance is at the 55 mph speed limit (6.24 mph), and the variances at 65 mph and 70 mph speed limits are roughly the same (5.03 mph and 5.24 mph, respectively). Although the variance differences among the three speed limits are small, which is consistent with the findings of Kockelman and Bottom (*3*), there is a higher variance with the 55 mph speed limit. While the sample is small and traffic-related effects are not accounted for (recall that only low-volume conditions are considered), in this sample it appears that a 55 mph speed limit may be too slow to achieve minimum speed variance.

Table 2 shows that the values of other variables in the sample, particularly those relating to socioeconomic variables, reflect those of the Purdue University community – with an average age of only 25, 25% being married, 18% having children under 6 years of age, and so on.

Methodology

As indicated in Tables 1 and 2, the survey contains three questions relating to normal driving speed under various speed limits; 1) normal driving speed on an interstate with a 70 mph speed limit and little traffic, 2) normal driving speed on an interstate with a 65 mph speed limit and little traffic, and 3) normal driving speed on an interstate with a 55 mph speed limit and little traffic. To develop a statistical model for each of these three questions, the use of ordinary least squares regressions is an obvious choice. Under standard linear regression assumptions, that includes the assumption that the model has all of the information relating to the regression equation and variables, estimated regression coefficients for the three equations are unbiased and efficient (*11*). However, if some information is not taken into account, the properties relating to the unbiasedness and efficiency of estimated coefficients cannot be determined. A classic example of potentially missing information is the knowledge that the disturbance term in one regression equation is correlated with the disturbance term in another. This will be the case for the three equations relating to normal driving speed at different speed limits since the unobserved factors that determine driving speed for each speed limit will likely be highly correlated.

Table 2. Sample statistics (standard deviation in parentheses when appropriate)

Variable	Values
Percent believing Indiana's recently raised the speed limits from 65mph to 70mph is: too fast/about right/still too slow	2/72/26
Average normal driving speed on an interstate with a 55 mph speed limit and little traffic	65.92 (6.24)
Average normal driving speed on an interstate with a 65 mph speed limit and little traffic	74.05 (5.03)
Average normal driving speed on an interstate with a 70 mph speed limit and little traffic	77.88 (5.24)
Percent rating the quality of pavements on Indiana interstates as: poor/fair/good/very good/don't know	11/30/44/9/6
Percent rating the quality of pavements on Indiana interstates as: worse than adjacent states/about the same/better than adjacent states/don't know	12/45/16/27
Percent believing the following luxury car brands provide the most prestige: Acura/ Audi/BMW/Cadillac/Infiniti/Jaguar/Lexus/Lincoln/Mercedes Benz	1/6/23/4/2/19/10/2/33
Percent believing the following vehicle brands provide the best value for the money: Chevrolet/Dodge/Ford/Honda/Hyundai/Kia/Mazda/Nissan/Toyota	8/2/11/37/6/2/2/7/25
Percent: female/male	26/74
Percent: married/single/separated/divorced/other	25/71/0/0/4
Average age	25.00 (6.46)
Percent with highest completed level of education: some high school/ high school diploma/technical college degree/college degree /post graduate degree	1/48/4/29/18
Percent with annual household income as: no income/ under $10,000/$10,000-$19,999/ $20,000-$29,999/$30,000-$39,999/$40,000-$49,999/$50,000-$74,999/$75,000-$100,000/Over $100,000	4/1/16/8/6/5/17/16/27
Average number of people living in household	3.52 (1.52)
Average number of children in household that are under age 6	0.18 (0.50)
Average number of children in household that are aged 6 to 16	0.26 (0.60)
Average number of people in household that work outside the home	1.91 (1.17)
Average number of licensed motor vehicles in household	2.82 (1.41)
Average number of years licensed	7.04 (6.11)

For model formulation, the speed variables are transformed by subtracting the speed limit from the reported normal driving speed – giving the number of miles per hour normally driven above the speed limit. This is formalized in the following equation system:

$$Speed_{70} = \beta_{70}Z + \alpha_{70}X + \varepsilon_{70} \quad (1)$$

$$Speed_{65} = \beta_{65}Z + \alpha_{65}X + \varepsilon_{65} \quad (2)$$

$$Speed_{55} = \beta_{55}Z + \alpha_{55}X + \varepsilon_{55} \quad (3)$$

In these equations, $Speed_{70}$, $Speed_{65}$ and $Speed_{55}$ are the number of miles per hour respondents normally drive above the speed limit (with little traffic) for 70, 65, and 55 mph speed limits, respectively. These variables can take on positive values if respondents normally drive above the speed limit and negative values if they normally drive below it. Also in these equations, Z is a vector of driver and driver-household characteristics, X is a vector of vector of driver preferences and opinions, β's, α's, are vectors of estimable coefficients, and ε's are disturbance terms. Note that Equations 1, 2 and 3 do not directly interact with each other. That is, $Speed_{70}$, does not directly determine $Speed_{65}$, $Speed_{65}$ does not directly affect $Speed_{55}$, and so on, as one would expect in a classic simultaneous equation system (see, for example, Shankar and Mannering, (*12*)). However, because all three responses represented by Equations 1, 2 and 3 are from the same driver, these equations are likely to share unobserved characteristics. In this case, the equations are seemingly unrelated but there will be contemporaneous (cross-equation) correlation of error terms. If Equations 1, 2 and 3 are estimated separately by ordinary least squares, the coefficient estimates are consistent but not efficient. Efficient coefficient estimates are obtained by considering the contemporaneous correlation of disturbances ε_1, ε_2 and ε_3. Considering contemporaneous correlation in seemingly unrelated equations was first considered by Zellner (*13*). Estimation of seemingly unrelated equations is accomplished using generalized least squares. Recall that under ordinary least squares assumptions the disturbance terms have equal variances and are not correlated, resulting in coefficients being estimated as,

$$\hat{\beta} = \left(X^T X\right)^{-1} X^T Y , \quad (4)$$

where $\hat{\beta}$ is a p×1 column vector (where p is the number of coefficients), X is an n×p matrix of data (where n is the number of observations), X^T is the transpose of X, and Y is an $n \times 1$ column vector. Generalized least squares generalizes this expression by using a matrix that considers for correlation among equation error terms (Ω), Equation 4 is rewritten as,

$$\hat{\beta} = \left(X^T \Omega^{-1} X\right)^{-1} X^T \Omega^{-1} Y . \quad (5)$$

The most difficult aspect of generalized least squares estimation is obtaining an estimate of the Ω matrix. In seemingly unrelated regression estimation, Ω is estimated from initial ordinary least squares estimates of individual equations (*11*).

Estimation Results

Table 3 presents the sample statistics for the variables found to be significant in the speed models. Excluding respondents with missing data, there were 195 valid observations. Following the numbers presented earlier in Table 2, with regard to the dependent variables, the table shows that drivers reported that they normally drove an average of nearly 11 mph faster than the speed limit on interstates posted 55 mph, about 9 mph faster than the speed limit on interstates posted at 65 mph, and nearly 8 mph faster than the speed limit on interstates posted at 70 mph. The standard deviation of normal driving speeds above the posted speed limit was 6.21 mph for 55 mph speed limits, 5.10 mph for 65 mph speed limits and 5.35 mph for 70 mph speed limits.

Seemingly unrelated regression estimation results are presented in Table 4. In general, the models fit the data well (especially considering the variance in the data) and the coefficient estimates are of plausible sign and generally good statistical reliability. It should be noted that these same models were run as separate regressions using ordinary least squares. The ordinary least squares regression coefficients had noticeably higher standard errors resulting in lower *t*-statistics (in fact, three variables included in the models presented in Table 4 had *t*-statistics less than one). Thus, the efficiency gains from using seemingly unrelated regression estimation are considerable in this case.

The results in Table 4 show that men normally drive faster than the speed limit on interstates posted 65 mph. However, this coefficient estimate was not highly significant and the male indicator variable was not statistically significant (*p*-values less than 0.10) on interstates posted 55 mph and 65 mph.

As expected, increasing driver age generally had a negative effect on the miles per hour normally driven above the speed limit. The age variable was significant for interstates posted 65 mph and 70 mph, resulting in about a tenth of a mile per hour reduction for each year older the driver becomes. However, age was found to be statistically insignificant for interstates with 55 mph speed limits.

Drivers from high-income households ($75,000 per year or greater) where found to be more likely to normally drive faster under all three speed-limit postings considered. Having a higher income resulted in about 2 mph higher normal speeds for 55 mph and 65 mph speed limits and a little over 1 mph higher speed for interstates with 70 mph speed limits. This could be reflecting their higher value of time or perhaps higher vehicle quality.

Drivers from lower-income households ($30,000 per year or greater) where found to be more likely to normally drive slower on interstates with 55 mph speed limits. However, this variable was not highly significant (*p*-value of 0.12) and the effect on normal speed was less than 1 mph. Again, this could be a result of value of time and vehicle quality.

The number of children less than six years of age in the household caused normal driving speeds to be lower for all three speed-limit models. The effect was to lower normal driver speeds about 1 mph. This may be a result of higher safety awareness among drivers with younger children.

Table 3. Statistics for variables found to be significant in model estimation.

Variable	Mean	Standard deviation	Minimum/Maximum
Dependent variables			
Miles per hour normally driven above a 55 mph speed limit	10.96	6.21	-5/35
Miles per hour normally driven above a 65 mph speed limit	9.06	5.10	-5/25
Miles per hour normally driven above a 70 mph speed limit	7.88	5.35	-10/20
Driver/household attributes			
Male indicator (1 if driver is male, 0 otherwise)	0.742	0.439	0/1
Driver age (years)	25.21	6.58	17/51
High income indicator (1 if household's total annual income is $75,000 or greater, 0 otherwise)	0.268	0.444	0/1
Low income indicator (1 if household's total annual income is less than $30,000, 0 otherwise)	0.289	0.454	0/1
Number of children under the age of 6 years old in the household	0.196	0.522	0/3
Late license indicator (1 if driver was first licensed at age 17 or greater, 0 otherwise)	0.361	0.481	0/1
Driver opinions			
Good pavement indicator (1 if driver believes pavement quality on Indiana interstates is good or very good, 0 otherwise)	0.531	0.500	0/1
German prestige indicator (1 if driver believes if German-brand vehicles are the most prestigious, 0 otherwise)	0.634	0.483	0/1
Japanese prestige indicator (1 if driver believes if Japanese-brand vehicles are the most prestigious, 0 otherwise)	0.119	0.324	0/1

Table 4. Seemingly unrelated regression equation (SURE) estimation results for the number of miles per hour above the speed limit drivers report as their usual speed (*t*-statistics in parentheses)[a].

Variable	**Estimated Coefficient (55 mph speed limit)**	**Estimated Coefficient (65 mph speed limit)**	**Estimated Coefficient (70 mph speed limit)**
Constant	11.11 (12.37)**	10.88 (10.27)**	10.86 (8.44)**
<u>Driver/household attributes</u>			
Male indicator (1 if driver is male, 0 otherwise)	–	0.470 (1.37)*	–
Driver age (years)	–	-0.088 (-2.47)**	-0.129 (-2.83)**
High income indicator (1 if household's total annual income is $75,000 or greater, 0 otherwise)	1.958 (2.06)**	2.099 (2.71)**	1.255 (1.52)*
Low income indicator (1 if household's total annual income is less than $30,000, 0 otherwise)	-0.763 (-1.17)	–	–
Number of children under the age of 6 years old in the household	-1.207 (-1.54)*	-0.993 (-1.48)*	-1.359 (-1.87)**
Late license indicator (1 if driver was first licensed at age 17 or greater, 0 otherwise)	-3.851 (-4.38)**	-2.148 (-3.00)**	-1.919 (-2.50)**
<u>Driver opinions</u>			
Good pavement indicator (1 if driver believes pavement quality on Indiana interstates is good or very good, 0 otherwise)	1.160 (1.46)*	1.067 (1.62)*	1.006 (1.43)*
German prestige indicator (1 if driver believes if German-brand vehicles are the most prestigious, 0 otherwise)	1.137 (1.85)**	–	0.582 (1.35)*
Japanese prestige indicator (1 if driver believes if Japanese-brand vehicles are the most prestigious, 0 otherwise)	-1.348 (-1.25)	-0.814 (-1.35)*	–
R^2	0.226	0.200	0.170
Number of observations		195	
Equation system R^2		0.202	

[a] One-tailed t-test results: ** significantly different from zero at more than 95% confidence, * significantly different from zero at more than 90% confidence

Individuals that were licensed at age 17 or later had normal driving speeds that were significantly slower under all three speed-limit postings (official licensing age is 16 years in Indiana). The magnitude of this slow down ranged from nearly 4 mph on interstates with 55 mph speed limits to about 2 mph on interstates with 65 mph or 70 mph speed limits. This variable was also found to be significant in some previous safety-related research. For example, using a sample of Washington State drivers, Mannering (*14*) found that the number of years after age 16 (the official licensing age in Washington) that women were licensed significantly increased the frequency of their roadway accidents. This variable may be capturing a self-selection process where individuals that are risk adverse or have poorer innate driving skills may wait longer to be licensed and drive more slowly.

Three preference/opinion variables were also found to influence normal driving speed. Those drivers that subjectively rated Indiana interstates as having pavements that were good or very good in quality were more likely to drive faster for all three speed limits considered (about 1 mph faster). This could reflect the impression that high quality pavements are quieter and safer which allows individuals to drive faster while maintaining the same risk/ergonomic comfort levels.

Two variables relating to drivers' impressions of vehicle prestige also played a role in the choice of normal interstate speed under various speed limits. Individuals believing that German manufacturers (Mercedes Benz, BMW and Audi) made the most prestigious cars were more likely to drive faster than the speed limit on interstates posted 55 mph and 70 mph. It is likely that this variable is capturing unobserved heterogeneity in the data (that is correlated with vehicle manufacturer perceptions) relating to drivers' perceptions of risk, the utility derived from higher speed driving, and so on. In a similar vein, those drivers believing that Japanese manufacturers made the most prestigious vehicles drove slower (less above the speed limit) on interstates posted 55 mph and 65 mph.

Summary and Conclusions

The controversy over increasing speed limits has continued to occupy public attention since the effective repeal of the Emergency Highway Energy Conservation Act in 1974 and its mandated 55 mph national maximum speed limit on interstate highways. To help resolve this controversy, seemingly countless research studies have been conducted – but their results have sometimes been contradictory and inconclusive (*3*, *5*). Increasingly, throughout this speed-limit controversy, legislators have been forced to deal with apparently contradictory public pressures to increase speed limits to more realistically reflect actual driving speeds and at the same time improve highway safety. And, increasingly, interstate speed limits have been systematically raised throughout the US.

The current paper focuses on the normal interstate speed selections of individual drivers when faced with three distinct speed limits, and uses seemingly unrelated regression estimation to determine the factors that affect these speed selections. The results show that a wide variety of factors influence speed choice. These factors range from socioeconomic variables (age, number of children, gender, and income), to age when first licensed, to driver opinions (pavement condition and opinions of vehicle prestige). The findings show that the relationship among the factors that determine drivers' optimal driving speed in the absence of speed limits (point *A* in Figure 1) and the effect that speed limits have on actual speed selection (points *C* and *E* in Figure 1), is quite complex.

Given the estimation results presented in this paper, and the observation that drivers' reported speeds are generally well above the speed limit, what does this say about how speed limits should be set? The results of this study cannot answer that question directly, but it seems clear that drivers do not believe that driving above the speed limit significantly threatens their safety. In fact, a recent survey of drivers indicated that 35% did not believe their safety was threatened until they were driving 20 mph over the speed limit, and an additional 3% thought that speed was snot a threat to their safety at all. It appears as though setting speed limits that will be respected requires a complex assessment of society's desire for safety and individual drivers' perception of the speed-safety relationship and the trade-offs they are willing to make.

As a final point, it is important to note that, while the Purdue University driver sample and methodological approach used in this paper provide insight into the speed/speed limit relationship, a more extensive sample would be needed to uncover the effects of geographic differences (so that inferences can be made on the transferability of results), past accident and moving violation history, a broader range of age differences, the impacts of traffic congestion, and so on. Still, it is hoped that the approach applied and results found herein can be used as a basis for further improving our understanding of the effect of speed limits on drivers' choice of speed.

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