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Regulation vs. the Market: The Case of Bicycle Safety [Part II]*

Ross D. Petty

Further Background

The CPSC Standard

The Consumer Product Safety Commission's bicycle standard is twenty pages long and took over five years to promulgate. It imposes significant compliance costs on both manufacturers and consumers. For example, it establishes frame and component stress tests, braking system tests, mandates the use of special reflectors, and generally prohibits numerous types of equipment and designs that are deemed unsafe.⁴⁵

The standard had its origin in the President's Commission on Product Safety. The Commission condemned children's high-rise bicycles in its FINAL REPORT. The Report noted that accessories then available such as steering wheels instead of handlebars, large protruding gear shifters, banana seats, and "wheelie" wheels, promoted injuries and unsafe practices such as riding double and performing "wheelies." It further announced that high-rise models accounted for 45% of all bicycles but were associated with 57% of all injuries. It condemned the industry for not developing product standards including ones for lights and reflectors.⁴⁶

* The first part of this article begins, *supra*, at 77.

⁴⁵ Most of this regulation became effective on May 11, 1976. Four subsections became effective on November 13, 1976. On June 1, 1977, a federal court remanded four provisions for reconsideration, and those four provisions were subsequently deleted. 16 C.F.R. § 1512 (1985).

At this time the Bicycle Manufacturers Association did develop a safety standard which was issued in 1970. The government first proposed a bicycle safety standard for bicycles used by those under sixteen years old on May 10, 1973. This proposal was made under the Federal Hazardous Substances Act by the Food and Drug Administration.⁴⁷ This proposal did not include a proposed effective date. It listed the problems it sought to address:⁴⁸

[a] study of the product causation data identified the following areas of product deficiency: (1) The rider's foot slipping off of the pedal, (2) brake failure, (3) a component failure, and (4) poor night visibility. Secondary injury causes relating to protruding hardware, sharp edges, and sharp points are also shown to be a factor in the accident picture.

The proposed rule was much broader in scope than this relatively modest appearing list of possible product hazards and was based primarily on the industry standard. The proposed rule covered all bicycles intended for use by children of less than sixteen years of age and established design or performance standards for nearly every bicycle component. Yet the twenty page staff report by the FDA's Bureau of Product Safety that purportedly served as a basis for the rule only identified foot slippage off the pedal and failure of the brakes, pedals and gearing as causes of accidents.⁴⁹ Moreover, the report identified unsafe riding techniques which would not be affected by the proposed regulation (e.g., riding double, jumping curbs, stunting, excessive speed and "wheelies") as a substantial cause of children's bicycle accidents.

⁴⁶ PRESIDENT'S COMMISSION ON PRODUCT SAFETY, *supra* note 3, at 18-20.

⁴⁷ Bicycles, Proposed Classification as Banned Hazardous Substance, 38 Fed. Reg. 12,300 (1973) (to be codified at 21 C.F.R. §§ 191.9a and 191c.).

⁴⁸ *Id.*

⁴⁹ BUREAU OF PRODUCT SAFETY, STAFF ANALYSIS OF BICYCLE ACCIDENTS AND INJURIES (1972).

Four days after the rule was first proposed, functions under the Federal Hazardous Substances Act were transferred to the newly-created CPSC. The Commission published its "final" regulations in 1974, revised them in 1975 and published them again in November, 1975 with effective dates in 1976.⁵⁰

Two individual consumers and one group of consumers challenged the legality of the promulgation itself and sixteen of the standard's provisions. On June 1, 1977, the Court of Appeals for the District of Columbia upheld the promulgation and most of the challenged provisions.⁵¹ It upheld the CPSC's authority to issue standards covering nearly all bicycles under the Federal Hazardous Substances Act which only applied to articles intended for use by children. The court also upheld the Commission's notice of rule making and its authority to issue design as well as performance standards. With four exceptions, the court upheld the Commission's support for specific provisions stating that it was not required to develop a precise "body count."⁵²

The court only remanded a broad prohibition of "protrusions," handlebar width restrictions, a brake system heat test which only applied to hand brakes, not to foot brakes, and a provision on pedal threads for which the court did not understand the Commission's justification. The Commission later republished its regulation with these four provisions deleted.⁵³

⁵⁰ See *Bicycles, Establishment of Safety Standard and Proposed Labeling Requirements*, 39 Fed. Reg. 26,100 (1974); *Bicycle Banning and Safety Regulations*, 40 Fed. Reg. 25,480 (1975); and 40 Fed. Reg. 52,815 (1975), respectively (all to be codified at 16 C.F.R. §§ 1512 and 1500.18 (a) (12)).

⁵¹ *Forester v. C.P.S.C.*, 559 F.2d 774 (D. C. Cir. 1977). The other parties who had filed for appeal of the CPSC's initial promulgation voluntarily dismissed their suits; 559 F.2d at 781.

⁵² *Id.* at 788.

⁵³ *Bicycles Revised Safety Standards*, 43 Fed. Reg. 60,034 (1978) (to be codified at 16 C.F.R. § 1512).

The Market Approach

The development and marketing of the hardshell bicycle safety helmet has largely been a market phenomena. The National Commission on Product Safety found that 14% of bicycling injuries are head injuries.⁵⁴ Although this report led directly to the establishment of the CPSC, the CPSC's standard does not require new bicycles to be sold with a warning on head injuries or a recommendation to wear a hardshell helmet when riding. The CPSC does encourage helmet use in some of its safety literature.⁵⁵ More recently, as discussed below, a number of cities have experimented with programs to encourage helmet use particularly by children. However, no jurisdiction other than Puerto Rico and recently Howard County, Maryland, has required bicyclists to wear helmets.⁵⁶ A new California law does require infants being carried on a bicycle to wear helmets.⁵⁷

The first hardshell helmets specifically designed for bicycle use

⁵⁴ PRESIDENT'S COMMISSION ON PRODUCT SAFETY, *supra* note 3, at 18-20. Selbst et al. found head and neck trauma to be the primary injury in 31% of bicycling injured children treated by The Children's Hospital of Philadelphia in the summer of 1983. Selbst et al., *Bicycle-Related Injuries*, 141 AM. J. DISEASES CHILDREN 140, 141 (1987). Similarly, 67% of those hospitalized in Calgary, Canada with bicycling related injuries had head injuries. Guichon & Myles, *supra* note 40.

⁵⁵ The CPSC's publication directed at child bicyclists, SPROCKETMAN COMICS, does mention the importance of wearing a helmet on page 25, but the title character does not even have one integrated into his superhero costume.

⁵⁶ See P. HILL, *supra* note 33, at 11 and 10 Pro Bike News 1 (Jul. 1990), respectively.

⁵⁷ CAL. VEH. CODE § 21204 (West 1987). Florida, Massachusetts, New Jersey and New York legislatures reportedly are considering similar bills. The New York Assembly also is considering a mandatory helmet use law for all bicyclists. 9 Pro Bike News 1, 2 (May 1989).

A recent study of 54 NEISS reported injuries to children riding in bicycle mounted child seats found that 65% of all reported injuries were to the head and face. 27% of the head injuries were serious. The study recommended that children in such carriers wear helmets. Sargent et al., *Bicycle-Mounted Child Seats*, 142 AM. J. DISEASES CHILDHOOD 765 (1988).

appeared in 1975. By 1979, articles in bicycling publications were comparing helmets and encouraging their use.⁵⁸ Also in that year, the American Standards Institute drafted its first proposed bicycle helmet performance standard. A final standard was adopted by this organization in 1983 and the Snell Memorial Foundation recently adopted a somewhat more demanding standard.⁵⁹ A recent review of helmets in *Bicycling* magazine covered 45 models from 20 manufacturers of the "dozens" of adult helmets available.⁶⁰

There have been no comprehensive national estimates or surveys of helmet use. The National Adolescent Student Health Survey did perform a national survey of over 11,000 eighth and tenth grade students. It found that 87% of them rode bicycles, but 92% of them never wore a helmet and less than 2% usually or always wore a helmet.⁶¹

In addition to this one national survey of two age groups, there have been surveys or observational helmet counts performed in a number of communities. For example, an on-the-street survey in Missoula, Montana counted 15% of observed bicyclists wearing helmets.⁶² Similarly, helmet counts performed in October 1984 and May 1987 in Palo Alto, California showed that, for people below about seventeen years old, usage increased from 10.5% to 15%. Those eighteen and older showed an increase from 21% to 34%.⁶³ A helmet count

⁵⁸ See, e.g., Rodale, *Helmet Progress*, 20 *Bicycling* 72 (Jan. 1979) and Swart, *Helmet User's Test*, 20 *Bicycling* 61 (Jun. 1979).

⁵⁹ For a detailed discussion of helmet performance standards and performance testing, see Minton, *A Head of the Game*, 1 *Bicycle Rider* 110 (1985) and the follow-up article, Howels, *Helmet Testing — Can We Live With These Standards?* 2 *Bicycle Rider* 50 (1986).

⁶⁰ Martin, *Crash Course*, 29 *Bicycling* 72 (Jun. 1988).

⁶¹ NATIONAL ADOLESCENT STUDENT HEALTH SURVEY, INJURY PREVENTION FACTSHEET (1988).

⁶² 5 *Bike Forum* 24 (Spr. 1987).

⁶³ 8 *Pro Bike News* 3 (Jun. 1988).

performed at eleven sites state-wide in the summer of 1986 found that 23% of observed bicyclists in Oregon wear helmets.⁶⁴ This study also suggested significant variations in helmet usage among different types of bicyclists. It found that 71% of bicyclists observed to be tourists wore helmets compared to 36% of those observed to be commuters and only 12% of recreational bicyclists.⁶⁵ Sadly, children in the Oregon Study and another study conducted in Tucson, Arizona have the lowest rate of helmet usage.⁶⁶ The Tucson study observed 468 bicyclists. Two elementary school children, no junior high school students, two high school students and fifteen college students wore helmets. The usage rates were 1.85%, 0%, 1.86% and 10%, respectively.⁶⁷

Moreover, it is not necessarily true that all bicyclists who own helmets use them all the time, or at all. A Madison, Wisconsin survey of bicyclists found that 19% own helmets but only 12% usually wear them when they ride.⁶⁸ Interviews of 516 bicyclists by Dr. Wasserman of the University of Vermont found that only 7.8% were actually wearing a helmet although 18.8% said they owned one.⁶⁹

⁶⁴ 7 Pro Bike News 3 (Mar. 1987).

⁶⁵ *Id.*

⁶⁶ The Oregon study found that 6% of child recreational bicyclists, 29% of child commuter bicyclists and 69% of child touring bicyclists wore helmets. The comparable figures for adults were 17%, 39%, and 72%, respectively. Unpublished charts from the OREGON DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION, Dick Unrein, Bicycle Program Manager.

⁶⁷ Weiss, *Bicycle Helmet Use by Children*, 77 PEDIATRICS 677 (1986). In contrast to their low usage rate, 65% of more than 135,000 children under the age of 17 who were surveyed by Cheerios, favored making bicycle helmet use mandatory for their age group. 30 Bicycling 34 (Jun. 1989).

⁶⁸ 12 BikeReport 4 (Oct./Nov. 1986) and Williams, *Promoting Helmets in Madison*, 17 Bicycle Forum 12, 14 (Fall 1987).

⁶⁹ Wasserman et al., *Bicyclists, Helmets and Head Injuries: A Rider-Based Study of Helmet Use and Effectiveness*, 78 AM. J. PUB. HEALTH 1220 (1988) (Of 21 bicyclists who reported falling and striking their heads, the 8 helmeted riders reported no head injury whereas 7 of the 13 unhelmeted riders reported such injuries).

Information on helmet usage also has been obtained from studies of accident victims. In August 1986, the CPSC collected data on helmet use from bicyclists treated for injuries in hospital emergency rooms. It found that during that month only 4% of those bicyclists treated wore helmets.⁷⁰ A similar survey conducted in King County, Washington in 1986 found that 25% of the accident victims wore helmets.⁷¹ Of the 520 children treated for bicycling related injuries in the Emergency Department of The Children's Hospital of Philadelphia in the summer of 1983 only 3 (.6%) wore protective equipment although 8% said they owned such equipment.⁷² Of 226 injured bicyclists in Boulder, Colorado who completed a questionnaire, only 33 (15%) wore hardshell helmets at the time of their accident.⁷³ Surveys of North Carolina emergency rooms revealed that 14 of 242 (5.8%) injured bicyclists treated in 1985 and only 3 of 395 (.8%) of those treated in 1986 wore helmets at the time of their accident.⁷⁴

Bell Helmets, a leading manufacturer of bicycle helmets, made its one millionth bicycle helmet in 1985 and estimates that between 800,000 and one million bicycle helmets are being sold each year.⁷⁵ Based on these figures, and estimates from the Bicycle Marketing Research Institute and other helmet manufacturers, I estimate that 8.7 million helmets have been sold in the U.S. through the end of 1988. Although

⁷⁰ Private conversation with Debbie Kensworth of the CPSC, on Feb. 16, 1988, concerning CPSC's in-depth study of bicycle accidents, published in August, 1986.

⁷¹ Survey reported in Wilson, *Bicyclists in Washington State: A Population at Risk* 13 (Unpublished paper available from the Bicycle Helmet Safety Institute, Arlington, VA, March, 1987).

⁷² Selbst et al., *supra* note 54.

⁷³ Watts et al., *Survey of Bicycling Accidents in Boulder, Colorado*, 14 PHYSICIAN SPORTS MED. 99, 100 (1986).

⁷⁴ STUTTS, ET AL., *supra* note 25, at 14.

⁷⁵ Letter from Mark E. Williams, Vice President/General Manager Bicycle Division, Bell Helmets, Inc. to the author, concerning bicycle helmet sales (Apr. 8, 1986).

these helmets are designed for only one crash, nearly all of them may still be in use. Thus, almost 9% of the estimated 85 million bicyclists in this country own hardshell helmets. As the above studies indicate, helmet usage appears concentrated among regular adult bicyclists, with children in most communities seldom using helmets.

Estimating Safety Effects

In order to properly determine whether the CPSC standard or the marketing of safety helmets has had an effect on bicycle safety, the number of injuries and fatalities over time must be examined while controlling for any changes in bicycle use and other factors that might influence injuries or fatalities. If the bicycle is to be considered a mode of transportation, then injuries per bicycle miles or bicycle trips should be examined. If bicycle use is considered recreational, then injuries per hour of bicycle use would be appropriate. Unfortunately, such information is not available for the general population of the U.S. on an annual basis.⁷⁶

Because information on the intensity of bicycle use is not available, Viscusi examined injuries per bicycle in use as a "second-best" measure of injuries controlled for use. He assumed a seven year operating life for bicycles.⁷⁷ The National Safety Council assumes a ten year life.⁷⁸

⁷⁶ A 1976 survey in the Federal Republic of Germany found 15.3 accidents per million bicycle trips, 6.6 accidents per million bicycle kilometers and 62.0 accidents per million hours travelled by bicycle. The comparable figures for automobiles were 11.6, 0.7 and 29.4, respectively. Brog & Kuffner, *Relationship of Accident Frequency to Travel Exposure*, in TRANSPORTATION RESEARCH BOARD No. 808 at 55 (1981). A recent Australian study calculated that regular bicycle users (ride at least once per week) in that country had 2.7–5.4 fatalities per 100 million kilometers, 2–4 hospitalizations per million kilometers, 55–110 fatalities per 100 million hours and 40–80 hospitalizations per million hours. The corresponding calculations for automobiles are 2, 0.8, 80, and 30, respectively. Mathieson, *Gaps in Current Knowledge*, in BIKESAFE 86 CONFERENCE PROCEEDINGS 55, 58 (Dept. Trans. ed. 1987).

⁷⁷ W. VISCUSI, *supra* note 9, at 84–5 and Viscusi, *supra* note 9, at 552. Viscusi's

Senior Economist Gregory Rodgers of the Consumer Product Safety Commission criticizes both simple formulations and calculates the number of bicycles in use by using the CPSC Product Life Model.⁷⁹ The use of bicycles as a control for bicycle use, regardless of whether a seven or ten year life is assumed, fails to account for whether or not bicycle owners are consistent bicycle users.⁸⁰ If a significant proportion of people buy bicycles, use them for a while and then store them away without further use, even a seven year operating life may be inaccurate. The analysis presented here hopes to provide a more accurate measure of bicycle use by estimating the number of active bicyclists for each year. These estimates are based on consumer surveys and industry estimates.⁸¹

A number of variables are postulated as likely to have an effect on bicycling related injuries or fatalities. Since bicycling is popular among young people and they are less likely to wear helmets than adults, some control for the proportion of youth in the population is needed. Two such measures were used: the proportion of population below the ages of thirteen and twenty-four. In each case tested, the proportion of

analysis contained an admitted critical limitation. He only examined data through 1981 but recognized that bicycles have an average operating life of at least seven years. His analysis therefore did not encompass a sufficiently long period of time to show whether the rule had any effect on the number of reported injuries. As expected, he failed to find any trend that might indicate the CPSC standard reduced the number of bicycle-related injuries reported to NEISS.

⁷⁸ See NATIONAL SAFETY COUNCIL, *supra* note 27, at 63.

⁷⁹ Rodgers, *Reducing Bicycle Accidents: A Reevaluation of the Impacts of the CPSC Bicycle Standard and Helmet Use*, 11 J. PROD. LIAB. 307, 311-2 (1988).

⁸⁰ Rodgers adopts users per bicycle in use as his control for intensity of use. *Id.* at 311. He does not explain why such a measure is appropriate.

⁸¹ The number of bicyclists were estimated by the author based on surveys performed by the Sporting Goods Dealer magazine, the National Sporting Goods Association, the A.C. Nielsen Company, the Department of Interior and the Gallup Company, as well as estimates by the Bicycle Federation. For much of this data in tabular form, see Petty, *The Consumer Product Safety Commission's Promulgation of a Bicycle Safety Standard*, 10 J. PROD. LIAB. 25, 42 (1987).

population under the age of twenty-four proved to be a slightly better predictor. The proportion of the population with health insurance coverage also was used to see if bicyclists are more likely to ride recklessly if they have insurance.

Other studies have looked at consumption or income based on the hypothesis that consumers with more income will purchase more safe goods. However, with bicycles it is not clear that more expensive bicycles are necessarily safer. In fact, expensive, lightweight bicycles may be more apt to fail than their less expensive counterparts. Therefore, no income or consumption measure was used in this study. This study also does not control for product liability lawsuits. Although the number of such lawsuits is generally believed to have increased dramatically in recent years, the bicycle industry has faced relatively few product liability lawsuits.⁸²

The principal independent variables of this study are whether the CPSC standard is in effect and the proportion of bicyclists who own (and presumably use) helmets. Because there is some disagreement concerning the operating life of a bicycle, the proportion of bicycles in use which satisfy the CPSC standard was calculated using the CPSC model and a simple model, assuming alternately seven and ten year lives. As noted previously, the author estimated the number of helmets in use based on industry figures to obtain helmets per bicyclist. Rodgers' study suggests two other variables. First, he uses a dummy variable to control for a change of the NEISS sample in 1979. Although he suggests that the change should not have much effect, the variable is significant in some of his results.⁸³ It therefore is also adopted here.

The second additional variable used by Rodgers is pedestrian fatalities. He argues that if drivers are more careful, perhaps due to

⁸² See *infra* notes 114–6 and accompanying text.

⁸³ Rodgers, *supra* note 79, at 311–4.

tougher law enforcement or reduced drunk driving, both pedestrian and bicycle fatalities should be reduced. This variable was found to be significant for fatalities, so it too was used here.⁸⁴ However, it is important to realize that such a variable would also encompass any other trends that would affect pedestrian fatalities such as the age composition of the population, the proportion with health insurance, etc.

The causal hypotheses to be tested are straightforward. The CPSC safety standard may cause a reduction in bicycling related injuries. Helmet use may cause a reduction in fatalities or head injuries. There is no reason to believe that the CPSC standard will reduce fatalities directly except through a reduction of total injuries. In addition, there is no reason to expect that helmet use will significantly affect the number of overall injuries, except to reduce the number of head injuries.

A simple linear model is tested here since there is no reason to assume a more complex relationship between the variables. Although Viscusi recommends using the lagged dependent variable as the first independent variable to control for the stock of pre-existing consumer products and avoid possible serial correlation effects, lagged variables were not used here.⁸⁵ Lagged variables were not needed here because the CPSC dummy variable controls for the stock of bicycles in use and intensity of use was controlled using participation rather than products currently owned. Thus, the equations to be estimated are:⁸⁶

⁸⁴ *Id.* Rodgers also uses a linear trend variable to “capture all omitted factors that affect the risk of injury smoothly over time.” *Id.* at 312. Since this variable was significant for fatalities and head injuries, it was tried here, but never achieved significance. It is difficult to imagine any such factors that would not be included in the pedestrian variable.

⁸⁵ Viscusi, *supra* note 9, at 532. To insure the accuracy of this assumption, lagged variables were included experimentally in both equations. In each case the lagged variables were not statistically significant and had negative coefficients.

⁸⁶ a is the intercept coefficient, and b_1 through b_4 are coefficients of the independent variables.

IR is the injury rate per thousand bicyclists using NEISS data — NEISS data was obtained from the CPSC on computer printouts for each calendar year. For more

$$[1] IR = a + b_1CPSC + b_2POP + b_3INS + b_4NEISS$$

$$[2] FR = a + b_1HEL + b_2POP + b_3INS + b_4PED$$

$$[3] PH = a + b_1HEL + b_2POP + b_3INS + b_4NEISS + b_5PED$$

Estimates of these equations using least squares multiple regression analysis are:⁸⁷

[1] $IR = 4.65 + 1.57CPSC + 0.80POP + 0.72INS - 0.42NEISS$,⁸⁸ with 0.012, 0.01, 0.063, and 0.244 significance.

[2] $FR = -3.34 + 0.35HEL + 0.07POP + 0.049INS + 1.15PED$,⁸⁹ with 0.062, 0.512, 0.69 and 0 significance.

[3] $PH = 14.17 - 1.12HEL - 0.76POP - 0.19INS - 0.34NEISS + 0.16PED$,⁹⁰ with 0.079, 0.045, 0.62, 0.139 and 0.586 significance.

information on NEISS, *see supra* note 25.

FR is the fatality rate per million bicyclists based on FARS data — published annually by the NHTSA — *see, e.g., supra* note 35.

PH is the proportion of head injuries reported to NEISS. I am indebted to Rodgers for catching arithmetic errors in my earlier study; *see* Rodgers, *supra* note 79, at 309. Rodgers' corrected figures are used here.

CPSC is one of four dummy variables assuming a seven or ten year bicycle life and a simple or complex life cycle model.

HEL is the proportion of bicyclists who own helmets.

POP is the proportion of the U.S. population below 24 years of age from the U.S. Census;

INS is the proportion of population with health insurance coverage calculated from census data and industry statistics. With regard to the latter, *see, e.g.,* HEALTH INSURANCE ASSOCIATION OF AMERICA, SOURCE BOOK OF HEALTH INSURANCE, 1988 UPDATE 3.

NEISS is a dummy variable controlling for the 1979 sample change.

PEDS is the pedestrian fatality rate per million automobiles in use based on FARS data. Rodgers uses pedestrian fatality estimates from the National Safety Council but bicycle fatalities from the FARS. Rodgers, *supra* note 79, at 312 n.9. There are significant differences between the two; this study uses pedestrian fatalities from FARS.

⁸⁷ The numbers following the equations indicate, for respective independent variables, individual statistical significance given by the t test. Following notes indicate for each equation, respectively, variance in the data accounted for by the equation, statistical significance, and autocorrelation among variables.

⁸⁸ $R^2 = 0.62$, $p = 0.021$, and Durbin Watson $d = 0.85$.

⁸⁹ $R^2 = 0.96$, $p = 0.000$, and Durbin Watson $d = 0.92$.

The results for equation [1] fail to confirm the causal hypothesis. It is statistically significant at the 97% level, and the CPSC variable is also highly significant.⁹¹ However, the positive coefficient of the CPSC variable suggests that the CPSC safety standard is associated with increasing rather than decreasing the injury rate.⁹²

In equation [2], an incredibly significant relationship is found, but the PED variable overwhelms all the other variables and almost completely explains the bicyclist fatality rate. Thus, traffic factors that affect pedestrian fatalities appear to affect bicyclist fatalities as well.

Helmet use is significant at the 90% level, but its coefficient is much smaller than that of PED. The helmet use coefficient is however positive, which is contrary to the causal hypothesis. It suggests that the fatality rate increases as helmet use increases. Dropping the overwhelming PED variable from the analysis reduces the amount of variance explained to only 50%, and, although the regression equation itself is significant at the 95% level, none of the individual variables are significant even at the 90% level. The insignificant coefficient for helmets does become negative in the modified equation.

This result is curious for two reasons. First, the simple correlation between fatality rate and helmet usage is -0.64 , significant at the 99% level. However, helmet usage is strongly negatively correlated with pedestrian fatality rates, health insurance coverage and both alternative population variables. The correlation coefficients range from -0.77 to

⁹⁰ $R^2 = 0.72$, $p = 0.014$, and Durbin Watson $d = 1.47$.

⁹¹ Of the four CPSC variables tested, the complex model with a ten year life obtained the most significant results, supporting Rogers' argument against using a simple model. See *supra* note 84 and related text.

⁹² If the NEISS figures are too inaccurate to be used, fatality rate could be used as an imperfect measure of the standard's effects. A similar multiple regression was run for fatality rate, but found population to be the only significant independent variable. The coefficient for the CPSC standard was negative, at least showing that it is associated with decreased fatalities, even though this relationship is not statistically significant.

-0.89, all significant at the 99.9% level. Thus, increased helmet usage may be associated with decreased fatality rates, but the effect may be masked by other trends.

The latter explanation is supported by equation [3] which uses the proportion of head injuries as the dependent variable. There, both helmet use and the proportion of young people in the population are significantly associated with the proportion of head injuries. Moreover, the helmet use coefficient is negative, indicating that, as usage increases, the proportion of head injuries decreases. Thus, it is the only equation to confirm a causal hypothesis.

As indicated, earlier, most fatalities are caused by head injuries.⁹³ Why then does helmet usage appear to affect head injuries but not fatalities? One explanation is that other factors besides head injuries influence fatality rates. This is suggested by the simple correlation between fatality rate and proportion of head injuries — a weak 0.27 that is significant only at the 70% level. Alternatively, annual head injuries are approximately 70 times the number of bicyclist fatalities. Perhaps changes in the latter are too small to be accurately predicted by this data.

It should also be noted that the Durbin Watson *d* statistics frequently appear noticeably different from 2.0, suggesting the possibility of first order autocorrelation.⁹⁴

Discussion

CPSC Safety Standard

Today, twelve years after the CPSC rule became effective, there is little evidence that it has significantly reduced injuries associated with

⁹³ See *supra* notes 39–41 and related text.

⁹⁴ As discussed *supra* at note 85, the use of a lagged dependent variable as an independent variable to correct for autocorrelation was not statistically significant, and achieved a negative coefficient showing an inverse relationship with the dependent variable. It also failed to improve the Durbin Watson *d* statistic.

bicycles.⁹⁵ In fact, the rule is significantly associated with an increase rather than a decrease in the bicycling injury rate.⁹⁶ There are a number of possible explanations for this finding. First, the NEISS data may be so inaccurate that this finding is invalid. Evidence, discussed above, suggests the inaccuracy of NEISS particularly with regard to bicycle injuries.⁹⁷ Second, it is possible that when consumers learn of the standard, they ride more recklessly.⁹⁸ This hypothesis appears unlikely

⁹⁵ This rule has also been criticized as an attempt by domestic manufacturers to restrict foreign competition. See, e.g., Cornell, Noll & Weingast, *Safety Regulation*, in SETTING NATIONAL PRIORITIES: THE NEXT TEN YEARS 457, 493–4 (H. Owen & C. Schultze eds. 1977), Viscusi, *supra* note 9, at 552, and S. Breyer, *REGULATION AND ITS REFORM* 115 (1982). For a refutation of this view, see Petty, *The Consumer Product Safety Commission's Promulgation of a Bicycle Safety Standard*, 10 J. PROD. LIAB. 25, 32–8 (1987). Actually the main goal of the domestic industry appears to have been to preempt state standards. See CONSUMER PRODUCT SAFETY ACT AMENDMENTS: *Hearings on H.R. 5361 Before the Subcomm. on Cons. Protect. and Fin. of the House Comm. on Interstate and Foreign Commerce*, 94th Cong. 1st Sess. 24, 65 (1975) (Statements of Jay Townley, Schwinn Bicycle Co. and John R. F. Baer, Bicycle Manufacturers Association of America).

⁹⁶ Even CPSC Economist Rodgers finds no statistically significant relationship between the standard and the injury rate. The major difference between our analyses appears to be his use of riders per bicycles in use as an independent variable to control for intensity of use. Such a measure presumes that when there are more riders relative to bicycles in use according to the CPSC Product Life Cycle Model, more bicycling is done than when there are relatively few riders per bicycle. Rodgers, *supra* note 79, at 315–6. As discussed *supra* at notes 76–81, the best measure of bicycle use, other than bicycle miles travelled (which is not available in the U.S.) is simply the number of people who consider themselves active bicyclists. For this reason, adopting injuries or fatalities per bicyclist as the dependent variable automatically controls for intensity of use.

⁹⁷ See *supra* notes 24–5 — sources and accompanying text. See also, Heiden et al., *The Utility of the U.S. Consumer Product Safety Commission Injury Data System as a Basis for Product Hazard Assessment*, 5 J. PROD. LIAB. 245–319 (1982) (1980 bicycle injury data is accurate + 27% with a 95% confidence level). Rodgers asserts that the NEISS standard of error for bicycle injuries is + 7–11%. Rodgers, *supra* note 79, at 316.

⁹⁸ Compare Rodgers, *supra* note 79, at 315 (helmet use by bicyclists may cause reckless behavior), Graham & Lee, *Behavioral Response to Safety Regulation: The Case of Motorcycle Helmet Wearing Legislation*, 19 POL'Y. SCIENCES 253 (1986),

because health insurance coverage that also might encourage reckless riding had no significant effect (at the 95% level) on the injury rate or fatality rate and also had extremely small coefficients. Moreover, unlike automobiles where the driver is surrounded by safety features, the bicycle provides no protection from falls and collisions. Painful "road rash" and more serious injuries should deter any reckless behavior induced by the standard. Third, there may be some other factor correlated with the rule that is the real causal explanation for the increase in the injury rate. Last, the standard may actually do some harm.

This last explanation should not be quickly dismissed. The standard requires that all bicycles be equipped with special reflectors in the front, rear, sides, and pedals. These reflectors were touted as having a 50% increase in performance over conventional reflectors, but while the required rear reflector, for example, does have a broader range of reflectivity, the SAE (conventional) reflector is 7–10 times more bright when illuminated directly.⁹⁹

There is little doubt that the CPSC's reflector standard is inadequate for safe nighttime riding. The CPSC as much as admitted this fact in a press release. The release noted that in 1975, nighttime deaths accounted for 30% of all bicycle fatalities, but in 1982, the figure had risen to 42%. It further urged bicyclists to use front and rear lights, a leg light, and reflective clothing in addition to the mandated reflectors to enhance their nighttime visibility.¹⁰⁰ The NHTSA recently reported that the proportion of bicyclist fatalities occurring between 6:00 P.M. and 6:00

and Peltzman, *The Effects of Automobile Safety Regulations*, 83 J. POL. ECON. 677 (1975) with Crandell & Graham, *Automobile Safety Regulation and Offsetting Behavior: Some New Empirical Estimates*, 74 AM. ECON. REV. PAPERS & PROC. 328 (1984). See also Viscusi, *The Lulling Effect: The Impact of Child Resistant Packaging on Aspirin and Analgesic Ingestions*, 74 AM. ECON. REV. PAPERS & PROC. 324 (1984).

⁹⁹ J. FORESTER, *supra* note 28, at 96.

¹⁰⁰ 3 CONSUMER PROD. SAFETY GUIDE (CCH) ¶46,671 (1984).

A.M. had risen to 45.6%.¹⁰¹

Contrary, to the CPSC standard, the National Committee for Uniform Traffic Laws and Ordinances continues to recommend laws requiring a front headlamp and rear reflector or light.¹⁰² Presently, all 50 states and the District of Columbia have adopted this recommendation.¹⁰³ Furthermore, at least one court has recognized the inadequacy of CPSC reflectors in a product liability case. It held a retailer negligent for failing to warn a consumer that reflectors are inadequate for nighttime riding and that a light should be installed.¹⁰⁴ The court seems to be saying that if the CPSC reflectors mislead bicyclists into thinking they can safely ride at night, retailers have a duty to correct this misimpression.

However, if the standard were increasing nighttime riding and injuries, it likely would not have a negative correlation (albeit not statistically significant) with fatality rates. Moreover, when specific types of injuries such as groin injuries are examined, the rule had no significant effect on them either.¹⁰⁵ Thus, if it is fair to judge the CPSC by its own data base, the evidence appears at best inconclusive and possibly negative.

There are at least three reasons why this result should not be surprising. First, as noted above, the bicycle is inherently unstable so the majority of bicycle-associated injuries are caused by operator error.¹⁰⁶ Even simple misjudgments can cause significant falling

¹⁰¹ FARS, *supra* note 35, ch. 8 at 12.

¹⁰² J. FORESTER, *supra* note 28, at 368-9.

¹⁰³ 1986 BICYCLE USA ALMANAC 28-9 (1986).

¹⁰⁴ Capuano v. Almart Stores, Inc., 1 Prod. Liab. L. Rep. (CCH) 78 (PA Northhampton County Court of Common Pleas # C-3849, Aug. 1982). This holding is contrary to another court's decision prior to promulgation of the CPSC standard. See Poppell v. Waters, 126 Ga. App. 385, 190 S.E. 2d 815 (1972) (The absence of a headlight is obvious so there is no duty to warn).

¹⁰⁵ Petty, *supra* note 95, at 43-4 and Rodgers, *supra* note 79, at 315-7.

injuries.

Second, unlike many products addressed by the CPSC which involve single hazards such as flammability or a sharp cutting edge, the bicycle is a somewhat complex product operated in a complex environment so that the interaction between the product, its maintenance and design; its operator; and the environment, create numerous possible safety issues. The CPSC simply may have been technically incompetent to deal with all of these issues. For example, one of the provisions remanded by the Court of Appeals was the CPSC's heat test for brake blocks of hand brakes. The Court found the distinction between hand and foot brakes to be irrational since only foot brakes are known to fail from excess heat.¹⁰⁷ Forester documents several other examples.¹⁰⁸

Third and finally, there is little evidence that product defects cause a significant number of bicycle-associated injuries. As Rodgers notes, the CPSC had estimated that 17% of all bicycle-associated injuries are related to product failure and would be addressed by the standard.¹⁰⁹ However, this estimate was derived from a sample of bicycle injuries designed to over-represent product-related injuries. The CPSC consultants who analyzed this biased sample estimated that the proportion of product-related injuries for the population as a whole was 8%.¹¹⁰

¹⁰⁶ See sources cited *supra* at notes 31–3 and BUREAU OF PRODUCT SAFETY, *supra* note 49, at 5–7.

¹⁰⁷ 559 F.2d at 793.

¹⁰⁸ J. FORESTER, *supra* note 28, at 363–9.

¹⁰⁹ Rodgers, *supra* note 79, at 316.

¹¹⁰ J. FLORA ET AL., EXTENSION OF THE NEISS DATA ANALYSIS INCLUDING CPSC IN-DEPTH REPORTS OF BICYCLE-ASSOCIATED ACCIDENTS 21 (1977) and Flora & Abbott, *supra* note 26, at 25. Interestingly, this study found that bicycles identified as being in compliance with the BMA/6 standard (upon which the CPSC's standard is based) had a slightly higher rate of product failure than bicycles which would not be identified as complying with the standard. This difference was not statistically significant. *Id.* at 24. See also, J. FORESTER, *supra* note 28, at 52, 84. (estimating

A lower estimate of the proportion of bicycle-related injuries caused by product failure is given by Jerrold Kaplan's 1974 study of regular adult bicyclists. He found that only 3% of all accidents, even those not severe enough to be reported to NEISS, for these users were caused by product failure.¹¹¹ Admittedly, the bicyclists in this sample were likely to maintain their bicycles in better than average condition. Of this small proportion, 3–8% of all injuries, perhaps as many as 90% of the failures occur in bicycles at least three years old.¹¹² Product standards covering new products cannot prevent eventual product failures from worn components or poorly maintained bicycles. Many bicycle components such as brakes and gearing require periodic maintenance and the replacement of worn parts.¹¹³ Thus, the actual proportion of injuries which the CPSC could have possibly effected through a product standard is probably less than 2% — far below its 20% goal across all products.

That only a very small proportion of bicycle accidents are caused by product defects is confirmed by casual observation of product liability

that 6% of all bicycle-related injuries and fatalities are caused by equipment failure); the University of Kansas Medical Center Survey, *supra* note 32, reported bicyclists blaming mechanical problems as the cause of 15% of their accidents. STUTTS ET AL., *supra* note 25, at 14, reports that 15.6% of bicycle related injuries treated in North Carolina emergency rooms in 1985 and 12.5% of those in 1986 were reported caused by mechanical failure.

¹¹¹ J. KAPLAN, CHARACTERISTICS OF THE REGULAR ADULT BICYCLE USER 51 (1975). See also, VIRGINIA DEPARTMENT OF HIGHWAYS AND TRANSPORTATION, PLANNING AND DESIGN OF BIKEWAYS (1974) (Bicycle defects were contributing factors in less than 3% of all bicycle-motor vehicle accidents) and a survey of children bicyclists between April and September 1983 in the Emergency Department of the Children's Hospital of Philadelphia found that they reported only 3% of all accidents occurred because of equipment failure. However, the bicycle was known to be in need of repair by the child or caretaker in 24% of the cases. Selbst et al., *supra* note 54, at 141.

¹¹² FLORA, *supra* note 110.

¹¹³ Kenneth Cross' study of bicycle/motor vehicle accidents found that brakes had the highest frequency of alleged contribution to bicycle/motor vehicle accidents. This problem was reported to be a contributory factor in 6% of the accidents studied. K. CROSS, *supra* note 25, at 36–7.

suits. Paul Hill, author of *BICYCLE LAW AND PRACTICE*, notes: "[t]here are relatively few reported bicycle product liability cases."¹¹⁴ He presents 13 reported cases and a couple of others.¹¹⁵ I have found two additional cases.¹¹⁶

By comparison, all terrain vehicles, which are associated with only 240 deaths annually and 86,400 other injuries in 1986 over only 6.7 million users, are the subject of over 300 product liability law suits reportedly currently pending against the industry leader. A coalition of 110 plaintiffs' lawyers has formed the ATV Litigation Group to share information.¹¹⁷ This coalition and the number of pending suits despite the comparatively small number of injuries indicates the products liability bar's belief that all terrain vehicles may be defectively designed.¹¹⁸ Apparently the bar has no such belief about the ATVs' older cousin, the two wheeled, non-motorized bicycle.

¹¹⁴ P. HILL, *supra* note 34, at 27.

¹¹⁵ *Id.* at 27-36. Hill summarizes the following cases: Poppell v. Waters, 190 S.E.2d 815 (Ga. App. 1972), Means v. Sears, Roebuck, 550 S.W. 2d 780 (Mo. 1977), Reis v. MTD Products, 456 A. 2d 211 (Pa. Super. 1983), Walden v. Sears, Roebuck and Co., 654 F. 2d 443 (5th Cir. 1981), Caporale v. Raleigh Industries, 382 So.2d 849 (Fla. 1980), Washington v. Otasco, Inc., 603 F. Supp. 1295 (N.D. Miss. 1985), Outwater v. Miller, 158 N.Y.S.2d 562 (1957), Khoder v. AMF, Inc., 539 F.2d 1078 (5th Cir. 1976), Tomczuk v. Town of Cheshire, 217 A.2d 71 (Conn. 1965), Levin v. Cleveland Welding Co. 87 N.E.2d 187 (Ohio 1963), Wilson v. Naifeh, 539 P.2d 390 (Okla. 1975), Barnes v. Sears, Roebuck, and Co., 406 F.2d 859 (4th Cir. 1969), and Parisi v. Carl W. Bush Co., 67 A.2d 875 (N.J. 1949).

¹¹⁶ Capuano v. Almart Stores, Inc., 1 Prod. Liab. L. Rep. (CCH) 78 (Aug. 1982) and Harris v. Giant Man. Co., 4 Prod. Liab. L. Rep. (CCH) 8 (Jan. 1985).

¹¹⁷ Wall St. J., Feb. 11, 1987, at 29, and Legal Times of Washington, Jan. 22, 1987, at 1, 8-10. See also Rodgers, *The Effectiveness of Helmets in Reducing All-Terrain Vehicle Injuries and Deaths*, 22 ACCIDENT ANAL. & PREV. 47 (1990) (1,100 ATV fatalities and 400,000 emergency room-treated injuries since 1982).

¹¹⁸ The CPSC and the Department of Justice recently announced a preliminary settlement of a lawsuit to recall all three wheeled ATVs. The settlement called for a ban of all future sales of three wheeled ATVs but has been criticized as too lenient. Nat'l L. J., May 2, 1988, at 8.

Helmet Usage

In contrast to the bleak safety results of the CPSC standard, there is some evidence, albeit contradictory, that the market development of safety helmets has had a positive impact on safety.¹¹⁹ The multiple regression results presented here indicate a significant positive or an insignificant relationship between helmet usage and fatality rates. This suggestion that helmet use may be increasing fatalities appears contradicted by the significant negative relationship between helmet usage and the proportion of injuries that are head injuries. Since there are many times the number of head injuries than fatalities, head injuries are more likely to show an effect from the small amount of helmet use. It would therefore seem that the head injury finding is more credible than the fatality rate evidence. Indeed, medical studies suggest that head injuries are the primary cause of bicycling fatalities.¹²⁰ In addition, a significant simple correlation of -0.64 was found between helmet usage and fatality rates, suggesting that with better data a stronger relationship might be found.

Perhaps even more compelling than the statistical evidence presented here, are medical studies that independently establish the beneficial safety effects of helmet usage. A recent controlled study by Thompson et al. compared 235 patients with head injuries received while bicycling to 433 other patients with non-head bicycling injuries and 558 population controls who were demographically matched to the head injury group. Unconditional logistic-regression techniques were used to calculate that riders who used helmets had an 85% reduction in their risk of receiving head injury.¹²¹

¹¹⁹ But see Rodgers, *supra* note 79, at 315–6 (helmet use positively related to fatality rate, but not significantly related to head injury rate).

¹²⁰ See *supra* notes 39–40 — sources and related text.

¹²¹ Thompson, Rivara, & Thompson, *A Case-Control Study of the Effectiveness of Bicycle Safety Helmets*, 320 N. ENG. J. MED. 1361 (1989).

An Australian study also suggests that helmets are effective in reducing head injuries related to bicycle use. Dorsch et al. surveyed club members to find 197 bicyclists who received a blow to the head or helmet in their most recent crash. They found a statistically significant difference in the severity of injury between helmeted riders and unhelmeted riders. They suggest that 90% of deaths due to head injury could be prevented by the use of hardshell helmets.¹²²

Conclusion and Recommendations

Political scientist, Aaron Wildavsky, has written: "Because regulation is anticipatory, regulators frequently guess wrong about which things are dangerous; therefore, they compensate by blanket prohibitions."¹²³ He neglects to mention that regulators often analyze risk in terms of their authority and preferences for dealing with it.¹²⁴ Thus, the CPSC did not carefully analyze all the risks of bicycling, but rather focused on product-related risks. It attempted to compensate for its narrow focus by regulating every conceivable product-related hazard, regardless of likely significance. The result is a safety standard that at best has no positive measurable effect on safety and may itself constitute a hazard.¹²⁵

¹²² Dorsch et al., *Do Bicycle Safety Helmets Reduce Severity of Head Injury in Real Crashes?*, 19 ACCIDENT ANAL. & PREVENTION 183 (1987).

¹²³ A. WILDAVSKY, *SEARCHING FOR SAFETY* 183 (1988).

¹²⁴ Thomas, *Revealed Bureaucratic Preference: Priorities of the Consumer Product Safety Commission*, 19 RAND J. ECON. 102, 112 (1988) (CPSC favored mandatory standards over other types of projects and weighed safety benefits more heavily than consumer costs).

¹²⁵ For similar research showing negative safety effects for bicyclists from changes in roadway design and other engineering "improvements", see Johnson et al., *The Wheels of Misfortune: A Time Series Analysis of Bicycle Accidents on a College Campus*, 2 EVALUATION Q. 608, 617 (1978) ("... engineering and impounding interventions intended to create a safer biking environment have had no significant impact on the number of bicycle accidents. They may also have made things

Congress deserves much of the blame for the CPSC's myopia. It could have created a broad-based safety agency rather than one focused on promulgating safety standards (and ordering recalls) as the only means of regulating product-related risks. Congress recently has modified CPSC authority to require it to use a more informational approach and rely on industry standards where they are effective.¹²⁶

Consistent with this new approach, the CPSC and other government agencies could play a significant role in improving bicycle safety in four ways. First, merely providing information can help. The CPSC and NHTSA both collect data on injuries and fatalities that enable others to study specific problems and judge whether progress is being made.¹²⁷ The NHTSA funded a study of bicycle-motor vehicle accidents that was published in 1977. It recommends specific strategies for reducing injuries and is still the best U.S. study available today on that topic.¹²⁸

Second, the government in publicizing safety problems often allows the market to work toward improving safety.¹²⁹ The CPSC could have conducted informational studies designed to expose various problems,

worse.”).

¹²⁶ The Consumer Product Safety Act's authorization to set mandatory standards was amended in 1981 to require the CPSC to rely on voluntary standards “whenever compliance with such voluntary standards would eliminate or adequately reduce the risk of injury addressed and it is likely that there will be substantial compliance with such voluntary standards.” 15 U.S.C. § 2056(b). *See generally*, Klayman, *Standard Setting Under the Consumer Product Safety Amendments of 1981 — A Shift in Regulatory Philosophy*, 51 GEO. WASH. L. REV. 96 (1982). Had this section been operative when the CPSC considered bicycles, it may have simply chosen to rely on the industry standard.

¹²⁷ *See e.g.*, Viscusi, *supra* note 6, at 76 (“Government regulation is the most effective institution for generating new risk information.”).

¹²⁸ K. CROSS & G. FISHER, IDENTIFICATION OF SPECIFIC PROBLEMS AND COUNTERMEASURE APPROACHES TO ENHANCE BICYCLE SAFETY (1977). For other examples of useful government efforts in this area, *see sources, supra* note 2.

¹²⁹ *See Viscusi, Market Incentives for Safety*, 78 HARV. BUS. R. 133 (1985) (arguing that government regulators underestimate the market incentive of the profit motive for producing safe products).

and done more to encourage safe riding and safety equipment usage.¹³⁰ As noted above, the FINAL REPORT of the Commission of Product Safety condemned high rise bicycles, led the industry to eliminate many of the criticized hazards and to develop its voluntary standard that served as the basis for the CPSC standard.¹³¹ Similarly, in the mid-1970's, the CPSC spent \$21,000 for a study of childrens' tricycles. The study found room for numerous safety improvements including lowering the tricycles' center of gravity, widening the rear wheels and limiting the turning radius. The CPSC refused to take any action such as proposing a safety standard based on the study.¹³² Soon after the report was produced, a second generation of tricycles appeared, often constructed of plastic, which incorporate many of these design proposals. The CPSC has just announced that it will study the adequacy of bicycle helmet industry safety standards and testing procedures.¹³³ If deficiencies are found, the industry might very well adopt any changes recommended by the CPSC.

Third, the government can play an important role in educating bicycle operators on how to avoid accidents and on the benefits of safety equipment.¹³⁴ For example just educating riders not to ride into a street without looking for other traffic first could reduce fatalities by 15% and nonfatal motor vehicle accidents by a comparable amount. Similarly, eliminating riding on the wrong side of the street would reduce fatalities by 8% and nonfatal injuries by over 20%.¹³⁵ As noted above, the

¹³⁰ Accord Rodgers, *supra* note 79, at 317.

¹³¹ See *supra* note 46 and related text.

¹³² Weaver, *The Hazards of Trying to Make Consumer Products Safer*, in CONSUMERISM: THE SEARCH FOR THE CONSUMER INTEREST 373 (D. Aaker & G. Day eds. 1978).

¹³³ 10 Pro Bike News 2 (Jul. 1990).

¹³⁴ See, e.g., Adler & Pittle, *Cajolery or Command: Are Education Campaigns an Adequate Substitute for Regulation?*, 1 YALE J. ON REG. 159 (1984) (evaluating three education safety campaigns of varying degrees of success).

CPSC has missed some opportunities to issue effective educational materials.¹³⁶ Moreover, the safety standard requires that consumer information on bicycle maintenance be provided with the bicycle, but does not require information on the benefits of safety equipment or rules for safe operation.

Of course, the CPSC does not have the budget to conduct an intensive nationwide education campaign. Perhaps such campaigns are best conducted at the local level as illustrated by helmet-usage campaigns successfully conducted by a number of communities.¹³⁷ A sixteen month community campaign directed at children increased helmet use in Seattle, Washington from 5.5% to 15.7% of observed riders. The late Bette Coan of Palo Alto, California developed three bicycle safety programs for children and had remarkable success in convincing children to wear helmets. She sold them more than 25,000 helmets.¹³⁸ Similarly, a promotion and coupon campaign in Missoula, Montana targeting helmets for school children sold 249 helmets in the first three and one-half weeks.¹³⁹ Two parents in Olympia, Washington purchased 60 helmets for grade school children and reportedly helmet wearing became commonplace shortly thereafter.¹⁴⁰

While the programs described above were largely developed from the efforts of private individuals, other programs have had the involvement of local government. Children and adults in Victoria, Australia increased helmet usage after an extensive promotional

¹³⁵ 12 Bicycle Forum 3 (Dec. 1985).

¹³⁶ See *supra* note 55 and related text.

¹³⁷ The Head Smart Coalition, National Safe Kids Campaign, and other groups, including the states of Florida and North Carolina, all planned helmet use promotional campaigns for 1989. 22 Bicycle Forum 1, 2 (Win./Spr. 1989) and 9 Pro Bike News 1, 2 (Mar. 1989).

¹³⁸ 15 Bicycle Forum 20 (Spr. 1987).

¹³⁹ *Id.* at 23.

¹⁴⁰ Wilson, *supra* note 71, at 20.

program. Primary school children increased usage rates from 4.6% in 1983 to 36.6% in 1985; secondary school children increased rates from 1.6% in 1983 to 14% in 1985 and adults increased their usage rates from 26.1% in 1983 to 42% in 1985.¹⁴¹

Last, a coalition of local government and various local organizations in Madison, Wisconsin conducted a one month helmet usage campaign. About half of all bicyclists there became aware of the message. Of the 50,000 bicyclists who were exposed to the campaign, about 5,000 were prompted to wear helmets, increasing observed usage rates from 15% to 19.2%.¹⁴² The CPSC missed an opportunity to encourage helmet use and light usage at night by not requiring conspicuous notices of the value of such devices somewhere in its standard.¹⁴³

Finally, the government, but not the CPSC, in its role as adjudicator, also helps reduce product-related injuries through the trial of liability lawsuits.¹⁴⁴ Because the number of reported bicycle lawsuits appears relatively small, they have been mentioned here only in passing.¹⁴⁵ However, even without rigorous analysis of the safety

¹⁴¹ Elliott, *Encouraging Helmet Wearing*, in BIKESAFE, *supra* note 76, at 355, 365, reprinted and condensed in, 23 Bicycle Forum 4-9 (Spr./Sum. 1989).

¹⁴² S. BERCHEM, A COMMUNITY CAMPAIGN THAT INCREASED HELMET USE AMONG BICYCLISTS: SUMMARY REPORT 19-20 (Traffic Engineering Division, Department of Transportation, City of Madison, WI, 1986).

¹⁴³ At least one pair of commentators noticed this opportunity early in the CPSC's existence: "The fact that at least 80% of the consumer product-related injuries may not be caused by defective or unsafe products suggests that consumer education has a large untapped potential for reducing such injuries." Miller & Parausarman, *Advising Consumers on Safer Product Use: The Information Role of the New Consumer Product Safety Commission*, 36 AM. MKTG. A. PROC. 372, 373 (1974).

¹⁴⁴ See e.g., Viscusi, *Product Liability and Regulation: Establishing The Appropriate Institutional Division of Labor*, 78 AM. ECON. REV. 300, 303 (1988) (Proposing that firms be exempted from product liability suits if they can demonstrate either compliance with a government regulation that leads to an efficient degree of safety or the use of a hazard warnings program that leads the market to promote an efficient level of risk.).

¹⁴⁵ See *supra*, notes 114-8.

effects of product liability suits, it is appropriate to mention briefly their interaction with regulatory and market efforts to improve safety. While some champion the common law as efficient,¹⁴⁶ others condemn products liability law as too overreaching.¹⁴⁷ This study suggests that bicycle product liability suits are efficient.

First, the threat of such suits (and potentially large liability awards) encourages manufacturers to reduce safety risks inherent in product designs, to warn of those that cannot be addressed through design changes, and to instruct users of other ways to avoid them if possible. Thus, such suits may substitute for or complement safety standards.

Second, recent amendments to the CPSA require firms that lose or settle three or more suits involving a particular product model to report this to the CPSC. While the information is kept confidential, it assists in setting priorities and conducting investigations.¹⁴⁸ Had this been done earlier, the low number of bicycle product liability lawsuits should have suggested to the CPSC that there was little need for safety standards.¹⁴⁹

Last, such suits may require consumers to take measures to ameliorate their own injuries. A recent North Dakota Supreme Court case ordered a new trial to include evidence on how the plaintiff's failure to use a motorcycle helmet may have foreseeably increased his injuries. On remand, it could well be the case that the plaintiff may recover only for those injuries that would have been suffered had he in fact been

¹⁴⁶ See, e.g., Landes & Posner, *Adjudication as a Private Good*, 8 J. LEGAL STUD. 235 (1979); Goodman, *An Economic Theory of the Evolution of the Common Law*, 7 J. LEGAL STUD. 393 (1978); and Rubin, *Why is the Common Law Efficient?*, 6 J. LEGAL STUD. 51 (1977).

¹⁴⁷ See e.g., P. HUBER, *LIABILITY* (1988).

¹⁴⁸ Nat'l L. J., Nov. 2, 1990, at 25.

¹⁴⁹ Liability suits do not directly prevent injuries, only compensate for them if fault is proved. In cases, like toxic substances, where fault is difficult to establish, liability suits may not be an efficient indicator of the correctability through standards of a safety problem. See, e.g., S. SHAVELL, *ECONOMIC ANALYSIS OF ACCIDENT LAW* 277-285 (1987), and Adler, *supra* note 21, at 79-80.

wearing a helmet.¹⁵⁰ While this decision appears to be in the minority and has not been applied to bicyclists yet, it may nonetheless represent a trend that may have a favorable impact of bicycle safety in the future.¹⁵¹ This aspect of private litigation furthers market efforts to improve safety by encouraging the purchase (and use) of helmets.

The CPSC may be able to avoid burdensome regulations if its efforts complement civil litigation. For example, it can test alternative warnings and instructions for effectiveness and propose the best for use. Such studies are likely to be very useful in determining liability in particular lawsuits.

Although this paper has focused on bicycles, it offers suggestions for improving safety generally. It supports arguments that a poorly conceived safety standard may be ineffective or, worse, do more harm than good — while appearing to address the problem. As Viscusi suggests,¹⁵² government efforts to assist market forces are likely to be more useful. The capacity of the government to conduct studies and publicize the results appears to be underutilized and offers a cost effective way to reduce risks of product injury.



¹⁵⁰ *Halvorson v. Voeller*, 336 N.W. 2d 118 (1983). See also Graham, *Helmetless Motorcyclists — Easy Riders Facing Hard Facts: The Rise of the "Motorcycle Helmet Defense"*, 41 OHIO ST. L. J. 233 (1980).

¹⁵¹ The wearing of helmets is analogous to using seatbelts. According to one recent article, the seatbelt defense in crashworthiness cases is recognized in 14 states, unsettled in 14 states, and rejected by the highest court in 14 states and by the legislature in 8 states. Westenberg, *Buckle Up or Pay: The Emerging Safety Belt Defense*, 20 SUFFOLK U. L. REV. 867, 886–9, 923–33 (1986).

¹⁵² *Supra* note 129.