Driving With The Brakes On: Guido Calabresi’s Failed 1970 Auto Insurance Case Against Safety-Device Mandates

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Abstract

Judge Guido Calabresi’s 1970 book, *The Costs Of Accidents*, gives two contrasting examples which together prove that efficient decisions about car safety devices must be guided by individual costs. Part I reviews Calabresi’s demonstration that, if charged accurate insurance costs, Taney would invest in improved brakes and Marshall would not.

To show why this demonstration has failed to inform debates over safety-device mandates, Part II builds a model composed of high-annual-miles Taney cars and low-annual-miles Marshall cars, which traditional insurance would not differentiate. But pooling cars with different annual miles overwhelms a reduction in risk per mile and produces incentives against buying safety devices. Although Calabresi discusses auto insurance as a one-variable ownership cost, the model shows why decisions must be guided by two variables. One is the odometer-mile “exposure unit” variable for measuring how much a car is operated, and the other is the cents-per-mile “risk rate” variable for evaluating by class how a car is operated (e.g., by safety-device and driver-age classes).

To explain auto insurers’ choice to shun cents-per-mile prices, Part III reviews their marketing choice to shun some correlations that proxy for high-annual-miles cars. The requisite first step in redeeming Calabresi’s free-market approach—cost guides decisions—is to acknowledge that insurance charged as an ownership cost produces nothing but wrong incentives for optimizing the costs of accidents.

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I. Calabresi’s Case

In his widely-cited book *The Costs of Accidents: A Legal and Economic Analysis*, Judge Guido Calabresi made a compelling case for using automobile insurance cost as the incentive to reduce risk. The book was a pioneering work in economic analysis of law when published in 1970 and has been in print ever since. However, no subsequent law and economics study of the costs of automobile accidents has engaged with Calabresi’s argument, apparently for a reason that few academics have acknowledged. Namely, Calabresi’s book overlooks problems that result from charging for insurance, not as a cost of operating a car which is the accident-producing activity, but as a cost of owning a car. This means using a single average cost for each insurance class pool to value the annual risk produced by each car in the pool. Although this average-annual-risk valuation conforms to traditional industry practice for private passenger cars, it defeats practical application and theoretical extension of Calabresi’s insurance-incentive thesis.

As support for these conclusions, I present the following analysis of Calabresi’s important economic case against government mandates for automobile safety devices.

The case contrasts the circumstances of two car owners named Taney and Marshall. Calabresi states that the “accident cost of Taney's operating an automobile can be viewed as the cost of insuring against the accident costs he causes.” He assumes that “we know the costs precisely.”

Taney drives a car. His car causes, on the average, $200 per year in accident costs. If a different kind of brake were used in the car, this would be reduced to $100. The new kind of brake costs the equivalent of $50 per year [footnote: “discounted over their effective life”]. If the accident costs Taney causes are paid either by the state out of general taxes or by those who are injured, he has no financial incentive to put in the new brake. But if Taney has to pay, he will certainly put the new brake in. He will thus bear a new cost of $50 per year, but it will be less than the $100 per year in accident costs he will avoid. As a result, the cost of accidents to society will have been reduced by $50.3

Calabresi asks if a government mandate to install the new brakes would not be better than having to rely on individual responses to insurance prices. He answers negatively by describing Marshall’s situation. In doing so he repeats the qualification that Marshall's insurance company evaluates accident costs precisely, but suggests here that the assumed accuracy may be difficult to achieve in practice.

Suppose that Marshall, who uses old-style brakes, has only $25 worth of accidents per year. It is not worth our while to force him to install the new brakes. Indeed, if he were made to install new brakes and if we can assume our measurements of costs to be accurate (a matter calling for a good deal of discussion later), forcing Marshall to install new brakes would add an unnecessary $25 to our [society’s and Marshall’s] cost burden.4

Unfortunately this description introduces a problem that must be addressed before continuing. Since the new brakes cost $50, which is $25 more than the accident costs with the old brakes, the $25 value Calabresi gives here for Marshall’s increased cost burden is too small to allow for any accident cost at all with the new brakes. With them

3 The Costs of Accidents at 73-74. A modified version of this Taney example is used by Goldberg and Zipursky, “Accidents of the Great Society,” 35th Anniversary Symposium at ms. 19, as an illustration of Calabresi’s case for using prices as incentives to reduce accident costs. The authors conclude that “[d]espite [the book’s] evident faith in pricing as a device for behavior modification, it is also technocratic in adopting an ‘engineering’ model of how law influences individual behavior.” Id. at ms. 31. But what I show in this Article is that it is auto insurers’ failure to adopt an ‘engineering’ model for the per-mile production of risk which frustrates the behavior modification—decisions influenced by price—which Calabresi expects from insurance prices.

4 The Costs of Accidents at 74. I have been unable to identify later in the book the “good deal of discussion” of accurate cost measurement called for here, unless what Calabresi has in mind is Chapter 9 “What is the Cost?” This Chapter, however, has to do with valuation of accident costs (like pain and suffering) rather than how accurately insurance premiums are tied to the accident risk insurers cover.
Marshall would have no need for insurance. In Table 1, “X” denotes the missing cost, but Part II assigns X a plausible value for the analysis.

<table>
<thead>
<tr>
<th>TABLE 1. Comparison of annual costs with old and new brakes.</th>
</tr>
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<tbody>
<tr>
<td><strong>Old-Style Brakes</strong></td>
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<tr>
<td>Accident Cost</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Taney’s Car</td>
</tr>
<tr>
<td>Marshall’s Car</td>
</tr>
</tbody>
</table>

Despite the problem of Marshall’s missing accident cost, the logic of Calabresi’s case is unassailable: For those with small annual accident risk like Marshall, investing in an expensive safety device is uneconomical. Extending Calabresi’s logic also shows why societal cost-benefit analysis of mandates for investing in automobile safety devices cannot be meaningful because the aggregate benefit in savings to high-annual-risk Taneys is offset or even exceeded by the unnecessary extra cost to low-annual-risk Marshalls. As examples of the inherent indeterminacy of results, a mandate for the new style brake would appear to be marginally justified by cost-benefit analysis in a world consisting of one Taney and one Marshall (-$25+X from Table 1 above), but not justified in a world of one Taney and two Marshalls (+2X). Although forcing all those in Marshall’s situation to buy new brakes would reduce traffic accidents, the added cost of the new

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5 The cost-benefit framework of the book’s analysis was noted by Richard A. Posner in his 1970 book review of The Costs of Accidents, 37 University of Chicago Law Review 636, 643, and repeated in his second review, “Guido Calabresi’s The Costs Of Accidents: A Reassessment,” 35th Anniversary Symposium. The connection of the Taney and Marshall examples to this framework is underscored by the second review’s singling out Chapter 5 containing the examples for its only unqualified albeit parenthetical praise.

The simplicity of Calabresi’s framework—a framework that, as I had suggested in my review, approximated cost-benefit analysis, though imperfectly—enabled law professors...to get their feet wet in the new field of law and economics. This was of enormous value. (The exposition of the basic economics of accident control, notably in Chapter 5 of The Costs of Accidents, is exemplary.) [Id. at ms. 6.]

The special notice taken here of Calabresi’s Chapter 5 makes it all the more puzzling that after 35 years there still may be no scholarly engagement with the new-style-brakes examples. Although the examples have been included in anthologized pages, to my knowledge they have not been specifically cited or discussed. But I invite correction because I have seen only 80 or so of the book’s 963 scholarly citations reported in Posner’s second review. Id. at ms. 3.

http://law.bepress.com/alea/15th/bazaar/art35
brakes would raise total costs. As Calabresi emphasizes throughout the book, reducing accidents and their costs cannot be the sole goal of accident law. Together with accident costs, the costs of safety devices and traffic control measures—e.g., driving more slowly has a cost—must be minimized (along with the costs of unspread losses and administration).

On the question of safety device mandates, Calabresi concludes that

[i]t will be expensive, if not impossible, to make collective decisions distinguishing the Taneys from the Marshalls. It will, in fact, be much easier if we let the distinction be made by Taney and Marshall themselves by letting them choose between paying for the accidents and paying for the new brakes.\(^6\)

As Calabresi cautions, however, the case for individual choice depends critically on accurate assessment by automobile insurers of individual accident cost with and without the new brakes.

The logic of the Taney and Marshall lesson apparently did not inform the debate over federal mandates for airbags. A source of controversy when airbags were optional was that cars equipped with airbags compared with the same model without the option averaged more collision claims per 100 car-years.\(^7\) The effect of antilock brakes on risk as reflected by insurance claims is also confused. Rather than using claims per 100 cars, which superior brakes should reduce, in fact one industry study had to rely on government statistics to compare fatalities per registered vehicle year.\(^8\) For reasons the Taney and Marshall example can help to reveal, the failure of auto insurance’s single cost vari-

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\(^{6}\) The Costs of Accidents at 74.

\(^{7}\) Steven Peterson and George E. Hoffer, “Auto Insurers and the Airbag: Comment,” 63 Journal of Risk and Insurance 515 (1996). As explanations for the higher annual rate of collision claims for airbag-equipped cars, the authors hypothesize that drivers of these cars either offset reduced risk of injury by being more negligent, or that drivers already subject to more risk preferentially invest in airbags. Although offsetting behavior probably has some effect, this Article suggests in Part III that car owners who invest in optional safety devices are apt to do more driving. In this regard, Peterson and Hoffer caution at 516 that, in the insurance data they use, “nonvehicle factors—such as annual mileage…that may differ by vehicle line have not been accounted for necessarily.”

able (class average cost per car-year)\(^9\) to evaluate the accident risk of individual cars within the class predictably leads to confused and often apparently perverse results.

II. Model Showing Perverse Incentives

To see why traditional auto insurance has difficulty in evaluating safety devices, this Part first considers how the annual accident costs Calabresi assigns to Taney and Marshall might come about, and how these costs might be measured. Next we create a model world consisting entirely of Taney cars and Marshall cars. With a model composed of individual cars of defined and measurable accident costs, we apply to it the insurance classification-only method of measuring an annual cost. Then we make investing in new style brakes an option for the Taneys and Marshalls to examine how their incentives and choices interact with the way that auto insurance would evaluate the new-brake and old-brake risk classes.

Measuring Annual Risk

Taney's car has an odometer. When the odometer is not turning, his car is not exposed to accident risk and therefore the car is causing no part of his annual accident cost: $200 with the old brakes, $100 with the new brakes. If Taney's car were driven fewer miles per year after installation of the new brakes, then the part played by the brakes in reducing accident costs would be called into question. However, the change in Taney's cost after installation of the new brakes only makes sense for the purpose of the lesson if it is specified—as Calabresi surely intended—that there is no change in how many miles his car is driven. Therefore, Taney's installation of new brakes reduces the cents-per-mile cost of his accidents—or "risk rate"—by 50 percent.

In Marshall’s case, the effect of the new brakes on his car’s risk per mile cannot be calculated from Calabresi’s description because the only accident cost he names is $25 per year with the old brakes. To get a plausible number for the new accident cost, the

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\(^9\) This cost variable is actually is the product of two factors, average claim size (severity) times frequency of claims. This Article is concerned with frequencies and compares two types: the time frequency of claims is the number of claims produced by a class pool of cars divided by the number of car years insured over the period when the claims were incurred. The distance frequency of claims is the number of claims incurred by a class pool of cars divided by the number of insured car miles driven during the period the claims were incurred. These two frequencies will be referred to as a claim rate per car-year (or per 100 car years) and as a claim rate per car-mile (or per million car miles).
simplest assumption is that the brakes would cut the per-mile risk rate of Marshall’s car in half as they do for Taney’s car. Forcing Marshall to invest in new brakes, therefore, would reduce his accident cost to $12.50 per year. But adding this cost to the $50 for the brakes would bring the annual total to $62.50, which represents a net increase of $37.50 over the old $25 accident cost. Even though the new brakes might be assumed to cut Marshall’s risk per mile more than the 50% reduction Taney gains, it cannot be as much as 100% to cut accident cost to zero—the amount Calabresi’s $25 net increase requires. Driving a car even one mile without risk of accident and adding this risk to the annual cost of risk is just as impossible as driving it a mile without using gasoline and adding to the annual cost of fuel. Furthermore, every mile an insured car is driven transfers a statistical but real cost to the car’s insurer.

Accurate conceptualization of the annual risk of individual cars depends on seeing practical ways to evaluate two independent cost variables: a cents-per-mile rate (the risk rate variable) and number of miles driven (the exposure variable). The exposure variable is already measured for Taney’s and Marshall’s cars because federal and state law backed by civil and criminal penalties requires that the number of miles driven by each car is permanently recorded on its odometer. Therefore miles traveled can be objectively verified. This variable is intrinsically individual, perfectly determinate, varies

10 The actuarial term of art is “exposure unit” or exposure base or medium. It represents the unit of risk transfer and unit by which prepaid premium is earned by insurers in providing coverage. Currently prepaid premium for private passenger automobile insurance is earned by the car-day exposure unit, but premium for some commercial fleets is earned by the vehicle-mile exposure unit as registered on odometers. For an early but still relevant review, see Paul Dorweiler "Notes on Exposure and Premium Bases," 16 Proceedings of the Casualty Actuarial Society 319 (1929). (Reprinted 58 Proceedings of the Casualty Actuarial Society 59 (1971)). Dorweiler writes: "The mileage exposure medium is superior to the car-year medium in yielding an exposure that varies with the hazard, as it responds more to the actual usage of the car," at 338. Note that Dorweiler's phrase "responds more" obscures the fact that the car-year medium does not respond at all to the actual use of the car.

11 An efficient per-mile insurance system would require odometer audits no more than once a year and in verifying coverage for claim settlement. Car owners would purchase miles of insurance in advance at the going cents-per-mile rate for the car’s class and driving coverages in amounts to suit individual needs and budgets. The miles purchased would be added to the odometer reading and recorded, along with the policy period, on the car’s insurance ID card. The owner would be responsible for buying more miles before the odometer limit was reached and coverage lapsed. (Exceeding the odometer limit and odometer tampering are standard coverage termination provisions in mechanical breakdown insurance contracts.) Comparisons of fraud control, mandatory insurance enforcement, and transaction efficiency
widely among cars, and for individual cars generally varies, widely at times, from year to year.

In sharp contrast to the individual nature of how much a car may be driven in a year, a risk rate (accident cost per unit of accident-producing activity) is intrinsically a class property. It is statistically impossible to measure an individual risk rate for either Taney’s or Marshall’s car. Because traffic accidents are infrequent and random, only the accident cost experience resulting from about 1,000 claims (which takes 200 million vehicle miles of travel at a risk rate of 5 claims per million miles and therefore requires a large number of cars belonging to the defined risk class) can determine a risk rate per mile that reliably predicts future accident costs. A risk rate value, therefore, is not a property of individual cars, but rather is the property of a large defined class of cars to which individual cars are assigned. Class definitions would include the presence or absence of statistically-valid safety devices.

Today, auto insurers must also use a large pool of cars to measure past costs per car year in predicting a future class cost. However, since pre-paid premiums are not adjusted according to subsequent changes in individual amounts of driving, in addition to determining past average costs insurers must also predict the future average level of driving using indicators such as the price of gasoline and economic conditions. Driving, accidents, and insurance claims increase when the economy improves and when gasoline prices decrease—and vice versa. In distinguishing differences in the accident costs of individual cars like Taney’s and Marshall’s, however, the auto insurance classification system has the same difficulty that Calabresi says the government would have in his observation, which is quoted more fully above in Part I, that “[i]t will be expensive, if not impossible, to make collective decisions distinguishing the Taneys from the Marshalls.”

To examine the nature of this impossibility, let us make a model consisting entirely of...
large numbers of Taneys and Marshalls,\textsuperscript{13} whose cars are insured under actual classification procedures and fixed pre-paid, time-period premiums.

\section*{Model Definition}

Matters to be settled in defining the model are why the annual risk for the Taney cars is eight times that for the Marshall cars ($200 versus $25 per year), why Calabresi might think this large difference is realistic, and why he thinks insurers might have difficulty in measuring it. Since each annual cost is expressible as a product of the risk rate variable and the exposure variable—a cents-per-mile rate multiplied by the miles Taney or Marshall cars are driven in a year—the cost difference can result from different combinations of values for these two variables. For example, the risk rate of the Taney cars might be four times and their annual miles twice those of the Marshall cars to produce the eight times difference in annual accident cost that Calabresi specifies they have with the old style brakes.

However, rather than assigning differences to both variables simultaneously, let us assign Taney and Marshall the same value for one variable at a time. Doing so assigns the difference in values for the other variable as the single cause of the eight times difference in annual risk. First, assume that all of the Taney and Marshall cars are driven the same number of miles per year, e.g., 10,000 miles. Consequently, the value of the other variable—the cents-per-mile risk rate—of the Taney cars must be eight times greater than the risk rate of the Marshall cars. Government accident and mileage data indicate that accident rates per mile are approximately two to four times greater both for urban versus rural driving and also for drivers at the young and old ends of the driver age range versus adult drivers. By combining the effects of these territory and driver-age extremes, we could model the eight-fold difference between the accident costs of the Taney and Marshall cars solely by difference in their risk rates. Because definitions for territory and driver-age classes are objective and verifiable at reasonable cost, auto insurers are fairly effective in policing these classifications despite the large differences in premium that depend on them. Government and other records are available to insurers for discovering

\textsuperscript{13} Specifying large numbers of cars in the model (tens of thousands) emphasizes the requirement for large numbers in a class to attain statistical credibility and stability for the risk-rate value measured for the class.
undisclosed household drivers and for preventing city dwellers from citing as their residence a vacation or relative’s home in the country.

This interpretation however would limit to very special conditions Calabresi’s case on the economics of investing in a safety device. The Taney cars’ high annual risk would be seen as urban household cars driven by young and old drivers the same number of miles as the Marshall cars whose low annual risk would be seen as rural household cars driven by middle-aged drivers. But surely Calabresi’s case should more generally apply to the large majority of cars with adult-driver risk rates per mile and a range of miles driven in a year.

Therefore the model assumes that the Taney and Marshall cars are in the same territory and driver class, which gives them the same risk rate\(^{14}\) when they have the same brake style. As a consequence, the entire difference in annual accident costs must be attributable to the difference in annual miles. The Taney cars travel eight times more miles in a year than the Marshall cars. Using an assumption that produces actual annual miles shows that this reason for the eight times difference in annual risk is realistic.

Having assumed that the Taney and Marshall cars are in the same risk rate class, we further assume that the value of the risk rate variable for this class is 1.0 cents per mile with the old-style brakes. It follows that the risk rate with new brakes is 0.5 cents per mile, and, from the annual accident costs Calabresi specifies, the annual exposure of each Taney car is 20,000 miles, and of each Marshall car is 2,500 miles. The eight times difference in annual miles driven by Taneys and Marshalls merely expresses in physical terms the dollar difference in annual risk Calabresi assigns to them. This range in annual miles accords with the 1977 federal Nationwide Personal Transportation Survey (and generally subsequent surveys) which shows that about 15% of household cars were driven less than the Marshall 2,500 miles, and about 10% were driven more than the Taney 20,000 miles. With these physical differences in annual cost defined by two meas-

\(^{14}\) To measure the annual risk rates Calabresi assigns to the Taney and Marshall cars, or the mile risk rates derived from the annual rates, we would have to assign them to separate classes, which is not possible by realistic assumption. Therefore, the risk rates are assumed. In contrast, the miles each car is operated can be measured individually with precision.
urable variables (per-mile risk rate and miles exposure), we can examine how auto insur-
erers would measure and charge for these modeled costs.

**How Insurers Estimate Future Miles**

In sharp contrast to the sizeable range in insurance prices across the territory and
driver classes, the price classes that purport to assess the effect of miles of exposure—
such as the “estimated future mileage” discount class for estimates of driving the car less
than 7500 or 8000 miles in the coming year and the future-use classes (pleasure only,
short or long drive to work, etc.)—have a narrow distribution. Insurance company prices
for about ninety percent of private cars driven by adult drivers fall within a range from
fifteen percent below to fifteen percent above the company’s base (average) price for
each territory. The range for the other 10% of adult-driver cars is bounded by a price
45% above average for a single business-use car on one policy and 40% below average
for multiple farm-use cars on one policy. Insurers would generally recognize the large
difference in miles exposure between the Taney and Marshall cars at most by a 15% to
20% discount and surcharge. This minimal response to wide variations in annual amount
of exposure to risk results from insurers’ attempt to account for the effect of mileage by
average costs in the face of price competition that favors owners of higher-miles cars.

Auto insurers enforce the low future-mileage discount largely by bluff. They
may request odometer readings on application and renewal forms, and allow the driving
public to assume mistakenly that miles already driven affects the premium amount and
that the odometer is subject to audit. Company rate and rule manuals, however, define a
car’s annual mileage by how far it will be driven in the coming year as stated by the in-

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15 Distributions of cars in insurance company Class Plans are normally considered proprietary
and not available outside of the company. (Class Plans are classification rules for cars defined by driver
age and sex, car use, etc. In principle the relative cost experience of each class supplies a multiplier to
adjust the base premium of each rating territory. In practice class relativities are “tempered” to meet regula-
tory restrictions and to serve marketing plans.) In the mid-1980s, however, in response to a Pennsylvania
Insurance Department order to assess the effects of changing entirely to unisex rating, companies made
their current class-plan populations available to the department (and public). The Adult-class (overwhelm-
ingly unisex) distributions for five major insurers representing half the state market are presented in Patrick
Butler, Twiss Butler, and Laurie L. Williams, “Sex-Divided Mileage, Accident, and Insurance Cost Data
Show That Auto Insurers Overcharge Most Women,” *6 Journal of Insurance Regulation*, Part I, 243 and
sured (or filled in by the agent). At the end of the policy year, insurers make no premium adjustment regardless of how many or few miles a car actually was driven. If a recession causes overall driving levels to drop unexpectedly, some auto insurers credit renewal premiums for each car in a state with a fixed percent—usually 5% to 20%—of the previous semiannual premium paid. The company however makes no attempt to determine which cars were actually driven less and which were not. The percent dividend goes equally to all policyholders. In rate regulated states companies are rarely asked to subdivide their actual experienced costs into the two future mileage subclasses to justify the price differential between them. When they do, the difference in average costs of the future mileage subclasses show a greater spread than the usual 15% discount amount. But the companies assure regulators that price competition forces them to keep the discount for cars driven low miles smaller than justified by their lower experienced cost. Insurers also affirm that any discount larger than a token amount makes it even harder for companies to control the awarding of discounts by agents as sales inducement and customer retention tools.

16 In 2001 an agent’s customer service representative was filling in my application as I watched (a usual procedure to save time) and, without consulting me, she wrote “12,000” for my car’s annual miles. When I objected, she replied “Don’t worry. It’s only for our statistics.”

17 Changing a car-year rate in response to reclassification is only done prospectively. When an insurer gets information that requires reclassification of a car, the new rate, whether an increase or decrease from the old rate, only applies to premium prepaid and earned from that day forward. No retrospective charges or credits are made. Presumably this applies even when a new young driver is not disclosed for months and, as a consequence, the insurer misses collecting hundreds of dollars in premium for coverage already provided. On the other hand, if a car is idled for months because it is inoperative or its driver is ill, standard practice is to make no refund after the fact. This second situation would not occur with cents-per-mile premiums because the insurer would only earn premium for driving coverages as the car’s odometer turns.

18 These and similar observations are documented by Butler et al., note 15 above, which is based on 2800 pages of stipulated exhibits and sworn testimony by actuaries for five defendant companies in the (unsuccessful) lawsuit before the Pennsylvania Insurance Department in 1986, Pennsylvania NOW et al. v. State Farm et al. (alleging in the main violation of the state Casualty & Surety Rate Regulatory Act and the state Equal Rights Amendment, ERA, by refusal to use the odometer-mile exposure unit resulting in targeting and overcharging women as a class) and appeal Pennsylvania NOW v. Insurance Commissioner 551 A2d. 1162 (1988). The Commonwealth Court’s opinion affirms the Insurance Commissioner’s reasoning that driver record pricing adequately evaluates the differences between men’s and women’s annual miles. However, at trial none of the parties, including the Insurance Department, raised the driver-record issue for all of the irrelevancy reasons Patrick Butler and Twiss Butler describe in “Driver Record:
Therefore, if the model were started with separate Taney and Marshall classes that are distinguished only by an ill-defined and intrinsically unverifiable future miles criterion, the pressures of insurance price competition (mainly for the Taneys, as discussed below in Part III) would lower the $200 price of the higher cost Taney class at the expense of raising the $25 price of the lower cost Marshall class. The difficulty of keeping a majority of drivers from getting low future-mileage discounts has caused some companies to discontinue them entirely. Because these discounts are divorced from underlying accident costs, there is little loss in rigor and considerable gain in reality by assuming that insurers—as Calabresi suggests—are not able to distinguish Taneys and Marshalls from each other. In the model, therefore, the high annual risk Taneys and low annual risk Marshalls are assumed to be indistinguishable by insurers and so charged the same class price.

**How Insurers Measure Car Safety**

In our model insurance world comprising many thousands of Taney and Marshall cars, the amount of the insurance cost and annual premium for each pool would depend on the proportions of Taney and Marshall cars in the pool and the brake type of the pool. Table 2 summarizes the effects for a number of hypothetical pools. (Each pool is keyed by a letter to the paragraphs discussing it.)

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A Political Red Herring That Reveals the Basic Flaw in Automobile Insurance Pricing,” 8 Journal of Insurance Regulation 200 (1989). For example, in the professional literature an actuary is quoted as characterizing auto insurance rating by individual claim records as an “organized renunciation of insurance.” From a lay perspective, a surcharged customer might reasonably question what their insurance premium was supposed to pay for in the first place if not for a claim? Moreover, the higher per-car-year claim rates for subclasses of cars with recent claims is simply an inescapable mechanical consequence of accounting for accidents and claims by the car-year and tells nothing about the per-mile risk of individual cars and drivers. Id. at *passim*. 

TABLE 2.

Effects of mixtures of Taney and Marshall cars in insurance pools on the incentive to invest in new brakes.

<table>
<thead>
<tr>
<th>Pool Designation</th>
<th>Insurance Pool Brake type</th>
<th>Insurance Pool per mile cost (a)</th>
<th>Ratio: Taney to Marshalls</th>
<th>Pool avg miles (b)</th>
<th>Insurance premium (c = a x b)</th>
<th>New brake cost (d)</th>
<th>Total cost (= c + d)</th>
<th>Saving (-) with new brakes (= new - old total cost)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One old-brake pool A versus three new-brake pools: B, C, D</td>
<td></td>
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<td></td>
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<tr>
<td>A</td>
<td>old</td>
<td>1.0¢</td>
<td>1 to 1</td>
<td>11,250</td>
<td>$112</td>
<td>n/a</td>
<td>$112</td>
<td>n/a</td>
</tr>
<tr>
<td>B</td>
<td>new</td>
<td>0.5</td>
<td>1 to 3</td>
<td>6,900</td>
<td>34</td>
<td>$50</td>
<td>84</td>
<td>- $28</td>
</tr>
<tr>
<td>C</td>
<td>new</td>
<td>0.5</td>
<td>1 to 1</td>
<td>11,250</td>
<td>56</td>
<td>50</td>
<td>106</td>
<td>- 6</td>
</tr>
<tr>
<td>D</td>
<td>new</td>
<td>0.5</td>
<td>3 to 1</td>
<td>15,600</td>
<td>78</td>
<td>50</td>
<td>128</td>
<td>+ 16</td>
</tr>
<tr>
<td>Approach to ideal: most Marshall cars in old-brake pool E, most Taney cars in new-brake pool F</td>
<td></td>
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<td></td>
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<tr>
<td>E</td>
<td>old</td>
<td>1.0</td>
<td>1 to 3</td>
<td>6,900</td>
<td>69</td>
<td>n/a</td>
<td>69</td>
<td>n/a</td>
</tr>
<tr>
<td>F</td>
<td>new</td>
<td>0.5</td>
<td>3 to 1</td>
<td>15,600</td>
<td>78</td>
<td>50</td>
<td>128</td>
<td>+ 59</td>
</tr>
</tbody>
</table>

Pool A (old brakes). This class pool comprises equal numbers of 20,000 mile Taney cars and 2,500 mile Marshall cars and has an average annual exposure per car of 11,250 miles. This average at the 1.0 cents per mile risk rate assumed for the old style brakes means that the insurance charge based on the average cost would be $112 per car-year. This same result, of course, would come from a weighted average of the annual accident costs of Taney cars and Marshall cars. With equal numbers of each with old brakes, the average of $200 and $25 equals $112, but there would be no physical basis that can be measured for the individual costs.

Pool B (new brakes). Suppose that after manufacturers introduced new style brakes, the insurer divided the class pool comprising equal numbers of Taney and Marshall into old- and new-style brake subclasses. Further, for the sake of argument, suppose initially that fewer high miles Taney cars than low miles Marshall cars by 1 to 3 have chosen the new brakes. The average exposure of the new brake pool is 6,900 miles, which at 0.5 cents per mile produces a pool cost of $34 per car year. If the proportion of the Taney and Marshall remaining in the old brake class is still approximately equal so the insurance cost is still about $112, there is an insurance savings of $78 per year or, with the $50 annual cost of the brakes themselves, a net financial incentive to buy the new
brakes of $28. Of course this incentive for investing in the new style brakes would appeal to Taney car owners as well as to Marshall car owners.

Pool C (new brakes). But if initially equal numbers (1 to 1 ratio) of Taneys and Marshalls had invested in the new brakes, the new-brake subclass insurance cost would be $56 per car year (0.5 cents per mile times the class average 11,250 miles). For Taney and Marshall cars still with old brakes and paying $112 insurance per year, therefore, the financial incentive to install new brakes would be an insurance saving of $56 offset by $50 for the brakes resulting in a net saving of $6 per year. Obviously, as the proportion of Taney to Marshall cars increases in the new brake subclass, the incentive to invest in new brakes decreases.

Pool D (new brakes). Recall, however, that Calabresi’s economically desirable choice is that more (or all) Taneys buy the new brakes and fewer Marshalls (or none) buy them. Assume that an approach to the optimal selection occurs and that the ratio of cars in the new brake class pool becomes 3 Taneys to 1 Marshall. Then the average annual exposure of the class pool becomes 15,600 miles per car and the accident cost at 0.5 cents per mile is $78. Adding the $50 cost of the brakes brings the total cost to $128, or, compared with the $112 per year paid by Taneys and Marshalls in the old brake class, a net $16 disincentive for installing the new brakes.

Pool E (old brakes) versus Pool F (new brakes). Moreover, as if this $16 disincentive to the economically desirable choice of new brakes for Taney car owners were not discouraging enough, consider what happens to the composition of the old brake class pool and its $112 price as more Taneys than Marshalls continue to buy the new brakes and leave the old brake class. Assume that as the Taney cars come to predominate over Marshall cars by 3 to 1 in the new brake class (which shows an insurance cost of $78 per car as in the previous paragraph), concurrently the Marshall cars come to predominate over the Taney cars by 3 to 1 in the old brake class. Thereby the average exposure of the old brake class pool drops from 11,200 miles to 6,900 miles per car. With this decrease in average miles for the old brakes subclass, even at 1.0 cents per mile, the cost the insurer measures for the subclass decreases from $112 to $69 per car year. Then the $9 increase in annual insurance cost from $69 to $78 on installation of the new brakes makes them seem to be a failure at reducing risk. Adding the annual cost of the new brakes brings the
total disincentive to buying them to $59 per year. The more nearly Calabresi’s efficient solution of all Taneys and no Marshalls installing the new brakes is approached, the larger the financial penalty for buying them becomes.

Before leaving Table 2, it is worth noting that charging for insurance as an ownership cost has the effect of degrading sharp differences in annual risk. The range in actual annual risk as defined by the model is 16 times from $12.50 for Marshall’s miles with new brakes to $200 for Taney’s miles with the old brakes. But with the mixtures of Taney and Marshall cars in the pools, the range in annual premiums is $34 to $112, a range of only about three times. The degradation of differences obviously stems from ignoring the differences in miles of risk that individual cars, identically classified, produce in a year.

Bearing in mind that Taneys and Marshalls are not distinguished by insurance prices and have the same financial incentives or disincentives to buy new brakes, can we predict which would be more likely to predominate in the new brake class, and which would be more likely to predominate by remaining in the old brake class?

III. Barriers to Assessing Operating Risk

By taking notice of economic conditions for operating a car beyond the insurance cost of accidents, we certainly can predict whether cars driven high annual miles or cars driven low annual miles will predominate in the new brake class. In the model, the specified difference between the Taney cars and the Marshall cars is a difference in annual miles of exposure. Even though this results in little or no difference in premiums, Taneys must spend about eight times more than Marshalls on gasoline each year. Miles of travel and car value are usually normal goods: the quantity individuals demand rises with income level. When expensive safety devices are optional, the buyers of new cars who take the option (like the Taneys) would also tend to drive more than those (like the Marshalls) who do not take the option. Therefore, when costs are compared between classes on a car year basis, as insurers do, the effect of the device on reducing the per-mile risk rate will be offset or even overwhelmed by the greater annual miles of risk averaged by the cars in the safety device sub-class. Newer cars would predominate in the new brake sub-class and older cars would predominate in the old brake sub-class. The old brake class, with more older cars and a lower average mileage, would show lower annual...
risk even though the class’s cents-per-mile risk might be twice as great as in the new brake class.

**Insurer Choices: What Exposure Unit? Which Classes?**

Although the failure of insurers to distinguish Marshall cars from Taney cars raises social costs, the benefits to the Taneys compared to their actual accident cost of $200 or $100 clearly show in Table 2 (page 14 above). In each hypothetical pool, the cost of the Taney benefits is paid for by the excess of the pool’s premium rate over the actual Marshall accident costs of $25 or $12.50. By choosing the car-year exposure unit instead of the odometer-mile, insurers demonstrate a clear preference for the Taney high-miles, high-annual-risk type of customer.

Over the years insurers have exhibited the same kind of preference in their choices of which classifications to employ, and which to ignore. The question of selective non-classification despite compelling statistics is currently an issue with sport utility vehicles (SUVs). In a law and economics study of the of the effects on risk of the increasing road mix of SUVs and other relatively heavy personal vehicles, Michelle White notes the failure of liability insurance to charge for the greater risk of damage SUVs and pickup trucks impose on cars. But she primarily blames state arrangements (such as no-fault insurance and low mandatory liability limits) for lack of insurance cost pressure against SUV ownership. However, in a footnote she cites reporter Keith Bradsher’s 2002 book on SUVs, which (in White’s words) “argues that insurance companies are loath to raise rates on SUV owners because they are more affluent and politically well-connected than owners of cars.”

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Since the first reports five months ago of the industry’s intentions [to raise liability rates for SUVs and lower them for cars], sport utility owners have bombarded insurers with letters, denounced them on Internet message boards and castigated them on talk radio shows. Conversely, drivers of cars and mini-vans who would benefit from lower liability rates have said little.
Although press and scholarly attention is now being given to insurers ignoring the greater liability cost of SUVs, no such attention has ever been given to decades of ignoring the difference in costs of providing liability coverage for new cars versus old cars. It is common knowledge that the miles cars are driven on average decrease as they get older. Consequently older cars produce fewer liability claims for their insurers to pay than newer cars do. Yet liability premium rates are unaffected by car age. The history of this anomaly is instructive.

Separate statistics on liability claims by car age became available in the early 1960s. Prompted by a belief at the time that drivers of older cars are more negligent and seeking cost justification for increasing liability premiums for older cars to the benefit of owners of newer cars, insurers studied the correlation of claim rates with car age. Contrary to their expectation, however, the study found just the opposite relationship: older cars produce fewer liability claims per car year than newer cars do. In response, how-

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21 Common knowledge is well supported by federal travel surveys. Comparing the first with the most recent survey, the average annual miles per household vehicle for 1969 and 2001 was, respectively, 15,700 and 14,892 miles for cars zero to 2 years old and 6,500 and 7,863 miles for cars 10 or more years old. Pat S. Hu and Timothy R. Reuscher, *Summary of Travel Trends*, 2001 National Household Travel Survey, Federal Highway Administration, Table 22 (2004).


23 That this belief is not so unspeakable as to be distracting is shown by Calabresi’s use of it as a hypothetical fact: “[W]hen costs are put on cars...most of the burden ends up on cars more than ten years old, with the result that they are almost priced out of the market and accident costs are reduced drastically.” *The Costs of Accidents* at 154.

24 Under insurance rate regulation law in many states, companies cannot be required to submit to regulators or rating bureaus loss experience categorized on any basis that the company does not use for its own class rates. Since liability premium rates were not varied by car age (and still are not), the industry bureau had to issue a special data call to member companies for the study the members themselves wanted.

25 Analyses of the relative risk of vehicle types (or their drivers) on a vehicle-year basis also need to account for the effect of the decrease in annual miles of vehicles as they get older. White, note 19 above at 345, suggests that “reckless drivers choose light trucks and careful drivers choose cars” because
ever, the industry has chosen to ignore these results. Merging the lower miles-exposure costs of older cars in insurance pools keeps premiums down for owners of newer cars in the same pools driven more than average. This long-time shifting of costs from new to old cars lends support to Bradsher’s argument that insurers are influenced in their pricing choices by the political and economic strength of some car owners versus others. Nonetheless, using car age categories to assess annual cost would be using car age as a proxy odometer for average miles, when the use of real odometers is called for. Despite the difference in averages, federal surveys show that several million late model cars are only driven a few thousand miles annually while many cars more than ten years old are driven much more than average. The reason that owners of old cars do not demand that insurers price to cost is that they do not feel entitled in the face of the conviction of the owners of high-annual-miles vehicles that their annual risk is no greater than that of any other car, new or old.

Car age is not the only obvious classification insurers have chosen to ignore to the benefit of one group of car owners at the expense of another. At every age men average more miles of driving and proportionately more state-reported accident involvements she finds at 346 that, during the period 1995-2001, light trucks relative to cars on vehicle-year basis were involved in 45% more two-vehicle accidents and 31% more one-vehicle accidents. But a major concern of White’s paper (which examines differences in injuries in accidents involving different kinds of vehicles) is that light trucks are an increasing proportion of personal-use vehicles, which means that they are even more prevalent among late-model vehicles. The 45% greater annual accident rate could be entirely accounted for by a difference in annual miles of newer versus older vehicles. (See note 21 above, for the nearly 2 to 1 ratio of average miles of new cars to old cars.) If the stock of cars to which light trucks are compared, for example, averages 10,000 miles per year, a light-truck average of 14,500 miles would explain the entire 45% greater vehicle-year rate of accident involvement by light trucks without reference to alleged reckless behavior by their drivers. (White’s data showing slightly less annual accident involvement of light trucks than cars with motorcycles and pedestrians indicate the importance of driving environment such as greater use of limited-access highways by higher-annual-miles vehicles).

As justification for the continued ignoring of car age in pricing liability insurance, McNamara, note 22 above at 47, a leading actuary and lawyer who at the time of writing was president of the industry rating bureau (Insurance Services Office) successor to the bureau that did the study, explains that “the use of statistics should be leavened with a liberal dose of common sense.” He does not explain what common sense means here, but presumably it means that competition for the insurance business of owners of late-model cars precludes raising their annual liability rates in order to lower them for old cars regardless of the strength of the statistical case for doing so. In other words, avoiding the backlash by SUV owners that Bradsher, note 20 above, describes is probably what McNamara means by common sense for insurance companies.
than women drivers. By adjusting driver age and marital status definitions insurers confine rating by driver sex to a minority of cars.\textsuperscript{27} Where the sex-rating of cars is fully legal in all but six states,\textsuperscript{28} driver sex has no effect on the premium paid for three out of four cars because insurers assign a large majority of cars to the Adult (unisex) classes. Where insurers use driver sex mainly for cars with young drivers, it serves as a proxy group odometer. However, rating of any or all cars by driver sex as a proxy odometer is as wildly inaccurate for individual cars as rating by car age as a proxy measure of average annual miles would be.\textsuperscript{29} In separate distributions of men and women drivers by annual miles and by annual accident involvement probabilities, the miles and probabilities of a sizeable minority of men drivers are less than the averages for women drivers, and concurrently a somewhat smaller minority of women drive more and have a greater probability of accidents than men’s average miles and accident probability.\textsuperscript{30}

It is a commonly-expressed opinion among both risk-and-insurance and law-and-economics scholars that, where allowed, automobile insurers are compelled by claim statistics correlations and price competition to choose certain classifications, and that current problems with auto insurance rates are mainly a consequence of regulatory politics that interfere with free-market realization of accurate cost-based pricing.\textsuperscript{31} In fact, from the foregoing examples, and others not discussed, it is clear that legislators, regulators, and insurers all respond similarly to the same political pressures. From time to time different regulatory battles become prominent, but tend to end with the status quo unchanged. There were battles in the 1970s and 1980s over classifying cars by driver sex, when in fact insurers where unfettered by law ignore the statistics of accident involvement by driver sex to classify the large majority of cars as “Adult” which serves to con-

\textsuperscript{27} Butler et al., note 15 above, at 251.
\textsuperscript{28} The six states are Massachusetts, Pennsylvania, North Carolina, Michigan, Montana, and Hawaii.
\textsuperscript{29} The distribution of cars by annual miles (overall and by category) is positively skewed because three out of five cars are driven less than average. Moreover, using a single annual mile average for all cars in a category because it is accurate for some cars is like using a stopped clock because it is accurate twice a day.
\textsuperscript{30} Butler et al., note 15 above, at 395-401.
ceal the fact that these large classes are also unisex.\textsuperscript{32} This anomaly, and its concealment, can only be explained as deference by insurers to the more politically and economically powerful sex.

In fact, selective choices by insurers of some classifications as proxy odometers and the rejection of others is quite in line with the industry’s choice of the car-year exposure unit instead of the odometer-mile.

\textit{The Ownership-Cost Culprit}

Overlooking Marshall’s accident cost in Calabresi’s new-brakes examples may be a result of viewing risk from an automobile insurance perspective as a lump-sum cost of car ownership. Because Calabresi specifies Taney’s reduced risk as “$100 per year in accident costs he will avoid,”\textsuperscript{33} it may seem reasonable that Marshall with the same new brakes should be able to avoid his entire $25 per year in accident costs with the old brakes. However, viewing vehicle safety in engineering terms as a cost per mile would help to prevent this kind of misperception.\textsuperscript{34}

\textsuperscript{31} For example, Posner in his second review, note 5 above at ms. 17, criticizes Calabresi on this point because he “fails to consider the degree to which government regulation of liability insurance impedes efforts by insurers to base liability insurance premiums on risk-related factors.”

\textsuperscript{32} The current battle is over insurers’ use of credit scores for rating. Just as stereotypes prompted insurers in the 1960s to consider raising liability rates for old cars, the stigma of poor credit has made it politically possible for insurers to raise rates for households with low credit scores while lowering rates for households with high credit scores. Unlike the case with old cars, however, claim rates actually do increase from the highest to the lowest credit category by a factor of 2, from 3 to 6 claims per 100 car-years for example. The theory insurers use to explain the correlation is that people who are financially negligent also drive negligently. However, an alternative theory consistent with the analysis of this Article holds that people with credit problems—like low-income households (many of whom have good credit scores)—have strong incentives to economize. Despite the inconvenience of sharing cars, household drivers economize on insurance by selling their marginal cars and piling all of their driving onto remaining cars, which raises the miles per car average for low credit-score categories. Under this alternative theory, the 2 times spread in annual claim rates is easily explainable as a 2 times spread in average miles per car, say from 7,500 to 15,000 miles a year. In other words, credit score categories like car age and driver sex serve as proxy odometers.

\textsuperscript{33} \textit{The Costs of Accidents} at 74.

\textsuperscript{34} When using automobile accident risk as examples, law and economics textbooks tend to work with lump sum valuations that combine miles of driving (activity level) with alleged care (care level) into one value. For example, A. Mitchell Polinsky, \textit{An Introduction to Law and Economics} (3rd Edition, 2003) at 52 follows insurance practice in an example that values three levels of care and two amounts of miles as six categories of accident cost as one variable with values ranging from $20 to $130. However, Robert
On the other hand, many scholars imply that auto insurance is a cost of driving by not being explicit about its being a cost that impinges only on car ownership. But throughout The Costs of Accidents, Calabresi is usually definite that insurance is a cost of car ownership. For example, he introduces the new brakes examples by stating that “[i]f the cost of all automobile accidents were suddenly to be paid out of a general social insurance fund, the expense of owning a car would be a good deal lower than it is now.”

Although Calabresi recognizes that auto insurance premiums furnish only one decision variable—whether or not to own a car—he states that general deterrence (accu-

Cooter and Thomas Ulen, Law and Economics (4th Edition, 2004) at 333 suggest that, in addition to a categorical variable, a continuous variable may be needed.

To hit two policy targets, two controls are usually required, just as two stones are usually needed to hit two birds. Thus, an additional control variable from outside liability law may be needed to control activity levels. For example, the number of miles driven by motorists can be influenced by a gasoline tax or an insurance policy whose premiums increase with the number of miles driven.

The difference in risk-measurement capability between these two suggestions is profound. The miles-driven suggestion would use the two essential variables for measuring risk—the categorical risk-rate-per-mile variable and the continuous odometer-mile exposure measure variable—as discussed in the next section. However, the suggestion for adding an insurance tax to gasoline (the gasoline-gallon was listed by Dorweiler in 1929, note 10 above at 338, as an exposure measurement variable) would preclude use of the categorical risk-rate variable unless each car could be identified at the pump: the cents-per-gallon rate would be a single value, e.g., 75¢/gallon, that would not change with amount and type of coverage and with risk classification such as by driver age and vehicle size. There could be no price incentives for choosing safer vehicles (except crudely, or even perversely, with fuel efficiency). In sum, an insurance surcharge on gasoline would exchange today’s class-only, no-exposure-measure system for a no-class, exposure-measure-only system.

Statements that an increase in the price of auto insurance will cause less driving (overall or by specific categories of cars and drivers) are not true in the sense that an increase in the price of gasoline causes less driving. Since increases in the cost of auto insurance reduces car ownership, driving will be reduced only to the extent that sharing cars reduces their availability and to the extent that insurance as a heavy tax on cars reduces income available to pay for gasoline and other operating expenses.


The Costs of Accidents at 71, emphasis added. Another of Calabresi’s examples describes how insurance can determine the number of cars a household owns. Taney will buy a second car if he lives in Sparta where general taxes instead of auto insurance premiums pay for accident costs. But a second car will cost too much if he lives in Athens where the costs of car accidents are paid for by insurance charged as a cost of car ownership. Id. at 70-71.
rate free-market insurance) must provide incentives for decisions about two ways to reduce accident costs:

The first and more obvious one is that [general deterrence] creates incentives to engage in safer activities... The degree of the shift will depend on the relative difference in accident costs and on how good a substitute the safer activity is. Whatever the shift, however, it will reduce accident costs, since a safer activity will to some degree have been substituted for a dangerous one.

The second and perhaps more important way general deterrence reduces accident costs is that it encourages us to make activities safer... It may be useful to show how general deterrence operates to cause a given activity to become safer.\(^{38}\)

Applied to automobile accidents, the first decision to reduce their cost would be to drive the car less, substituting safer activities such as taking the bus or train. The unacknowledged problem is that so long as the car is owned and insured, driving it less makes virtually no difference to the cost of insurance. Therefore, traditional insurance is incapable of providing any incentive to shift to safer activities.\(^{39}\) As noted above, reclassification from the long-drive-to-work class to the pleasure-only class provides only nominal discounts.

Calabresi illustrates the second way to reduce accident costs—making activities safer—with the examples of Taney’s and Marshall’s decisions about whether or not to install new-style brakes. In fact, the modeling of these decisions in Part II above involves both ways of reducing accidents costs: driving the car fewer miles and installing better

\(^{38}\) The Costs of Accidents at 73. The Taney’s new brakes example quoted above at note 3 directly follows this introduction.

\(^{39}\) This criticism of auto insurance premiums as lacking an incentive bearing on how much to drive was also made by Oliver E Williamson., Douglas G. Olson, and August Ralston, 1967, “Externalities, Insurance, and Disability Analysis,” 34 Economica 235, 248 (“[T]he auto insurance premium...acts as a lump-sum rather than a marginal tax.”), and simultaneously by William Vickrey, 1968, “Automobile Accidents, Tort Law, Externalities, and Insurance: An Economist's Critique,” 33 Law and Contemporary Problems 464, 470 (Rates “provide incentives that are largely inappropriate at the margins where decisions are made as to...whether to make a given trip by car.”) The Costs of Accidents at 20 n.3 lists both these works as recent significant articles by economists dealing with the problems of accidents, but does not discuss them further. Nothing expressing such serious criticism seems to have been written since by economists (my articles beginning in 1988 appear in insurance regulation and actuarial journals) until Aaron Edlin,
brakes. But as the model demonstrates, each way would require its own independent decision variable. First, an exposure variable measuring individual values is necessary to provide the incentive to drive an individually efficient number of miles. Second, a class risk-rate variable must price the per-mile cost to inform ownership decisions about safety devices and vehicle types. Although Calabresi above judges that the first variable is more obvious and that the second may be more important, in fact they perform inseparable complementary functions for measuring the risk produced by operating an automobile. Neither variable can function without the other and both are essential for assessing individual cost. In effect, each class’s premium rate is based today on the product of the now unmeasured class averages of these two variables: (the class’s cents-per-mile risk rate) times (the class’s average annual miles per car). But merged, as insurers do, this product of two variables can only inform decisions about whether or not to own a car.


Calabresi introduces the issue of vehicle type early in The Costs of Accidents at 9. He describes the effect on the insurance cost of owning different kinds of cars as a consequence of changing the insurance system from third party to first party:

[I]nurance would be cheaper for owners of the Juggernaut Eight, which is likely to crush all that comes in contact with it but leave its passengers unhurt, or owners of the Safety Six, which has many expensive devices to protect the riders, and more expensive for owners of the Foreign Fly, which barely scratches what it hits but is likely to collapse on contact with a Juggernaut.

But under either system attempting to value risk as a function of vehicle type on an annual basis cannot provide any but degraded incentives (at best) to affect vehicle choice because each car owner actually has two related decisions to make, not just the kind of vehicle but also how much it will be driven. For example, by analogy to the model above, Marshalls would produce less total annual risk (third plus first party) by driving high-risk-rate Juggernaut Eights only 2,500 miles than Taneys would produce by driving low-risk-rate Safety Sixes or Foreign Flies 20,000 miles.

Under the odometer-mile exposure unit, a high cents-per-mile, low “risk efficiency” rate would affect vehicle purchase decisions the way a low fuel efficiency always has. Marshalls might purchase old heavy Juggernaut Eights with poor risk and fuel efficiencies because these characteristics make it a cheap car to buy, and low annual miles of use would still keep annual insurance and gasoline costs low.

Williamson et al., note 39 above at 247-248, also conclude that the failure of auto insurance premiums to vary with the amount of accident-producing activity impairs incentives to invest in safety devices. As a remedy, however, they recommend government safety-device mandates, which Calabresi’s Marshall example shows would increase social costs.
Calabresi’s “Organized Activity” Criterion

The potential of insurance cost to affect decisions plays a key role in Calabresi’s analysis of how to allocate the costs of car accidents with pedestrians. Although the following passage refers to insurance costs that “affect behavior,” it does not mean the individual *ex post* premium surcharge for being at fault in an accident, the threat of which is supposed to affect behavior by deterring faulty driving. Calabresi means that insurance cost should affect decisions *ex ante* before the risk that insurance covers is produced by walking or driving.

[T]he fault system’s concentration on whether the particular pedestrian or driver could avoid the accident most cheaply ignores the fact that because of insurance, neither will actually bear the accident costs. And the breadth of the insurance categories that will actually bear the costs and therefore affect behavior depends not only on the difference in accident-cost causing potential of the members of the category, but also on the cost of differentiating these members into subcategories and selling insurance to such differentiated groups. This in turn depends on whether the loss is placed on an organized activity such as driving or on an unorganized activity such as walking.\(^\text{42}\)

In this passage, Calabresi distinguishes between activities that are organized—presumably like driving—so that they can be specifically insured as such and unorganized activities like walking that can only be insured as part of the cost of general accident or even health insurance. Although he does not discuss what it is that makes driving organized and walking not, Calabresi gives examples that emphasize the feasibility of categorizing drivers and cars.

In theory, if the cost of [car-pedestrian] accidents is put on drivers, insurance rates will reflect not only the difference in accident-proneness of different categories of drivers (teen-age drivers, city drivers, extra-mileage drivers, etc.), but also the safety of the cars they drive (old cars, cars with special brakes, cars with seat belts, etc.)….In practice, however, the decision to put such accident costs on drivers makes any substantial categorization by type of car too expensive.\(^\text{43}\)

\(^{42}\) *The Costs of Accidents* at 248. Emphasis added.

\(^{43}\) *The Costs of Accidents* at 105-106. Calabresi is correct that categorization cannot be done to any degree desired, but expense is not the problem so long as categories are objective, verifiable, and make sense to car owners. In fact, the limit to the number of insurance categories is the rapid decrease in year to
With its focus on drivers, however, Calabresi’s description differs from automobile insurance practice where the car, and not its drivers, is the entity classified and therefore the entity to which the insurance premiums and claim costs attach. Before coverage begins, insurers assign the car to a class according to both driver and car criteria. The cost of subsequent claims paid under the coverage is assigned to the car’s class even if the driver who was driving when the claim was incurred was not the driver whose characteristics determined the car’s classification.\textsuperscript{44} Insurers’ annual premium rates for class costs refer to the car-year exposure unit.

Instead of the car-year unit, however, insurers might just as well have chosen the driver-year. Drivers are licensed and have verifiable characteristics that can be used to define risk classes such as some of those Calabresi suggests: teen-age drivers and city-resident drivers. (But “extra-[future]-mileage drivers” and cars can not form objective, enforceable insurance cost accounting classes.) Just as driver characteristics serve to define car classes, car characteristics could be used to define driver classes using the driver-year exposure unit.\textsuperscript{45} In fact, because pedestrians can be classified as teen-age pedestrians and city-resident pedestrians, pedestrians by the classification feasibility criterion are nearly as well organized entities as drivers and cars.

What Calabresi omits from consideration of specifically-insurable accident-producing activities is the amount of the activity. A teen-age city pedestrian who walks 1,000 miles annually produces five times more car-pedestrian accident risk per year, all else made equal by classification, than a teen-age city pedestrian who takes five years to

\footnotesize{\textsuperscript{44} Other claims from such occasional sources as collision damage done to a rental car being driven by a household driver are also paid (less deductible) and charged to the household car’s insurance class, along with claims representing excess liability coverage on a rented or borrowed car driven by a household driver.}

\footnotesize{\textsuperscript{45} Statistical stability of thinly occupied insurance accounting cells as the number of cells increases rapidly with number of categories, regardless of the mix of driver and car categories used. If each of the six kinds of category suggested in the quotation is binary (teen or not-teen driver, old or new car, etc.), the number of cells increases by the power of two with each kind, 8 cells for the driver and car categories separately, or 64 cells for the combined categories. Lack of data credibility from trying to use too many categories is a major problem for actuaries who describe it as: “You can slice the cake this way, or you can slice it that way, but if you slice it this way and that way, what do you get? Crumbs.”}
walk the same distance. Because neither pedestrians and nor drivers wear odometers, neither walking nor driving various cars can be a specifically-insurable organized activity.

Although owning a specific car can be insured for the accidents that operating the car produces, simply owning the car does not produce any traffic accident risk. An insurer’s information about a car’s ownership provides no information about how much the car is operated. But an accident-producing activity whose amount is not measurable cannot meet Calabresi’s criterion of being a specifically-insurable accident-producing activity. Because of odometers, only operating a specific vehicle can be a specifically-insurable “organized” activity involved in traffic accidents.

**Conclusion**

*The Costs of Accidents* presents a vision of insurance costs that accurately guide individual “decisions for accidents.” 46 This free-market (or “general deterrence”) approach is one of the two approaches Calabresi describes for the control of accident costs. The other is the collective (or “specific deterrence”) approach which aspires to control the costs of accidents through the political process. 47 An example of the collective approach is mandating that both Taney and Marshall invest in the new-style brakes. Calabresi’s unsung case against such collective decisions is his demonstration that, although the safety-device mandate would reduce accidents and thus accident costs, it would increase society’s (and Marshall’s) total costs.

As the alternative, Calabresi describes the logic of the free-market, general deterrence approach.

General deterrence implies that accident costs would be treated as one of the many costs we face whenever we do anything. Since we cannot have everything we want, individually or as a society, whenever we

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45 Proposals to insure the driver instead of the car appear occasionally. For example, pursuant to Pennsylvania Act 6 of 1990, Section 29, the Joint State Government Commission in 1991 produced its “Insure-the-Driver Program” study.


47 “The collective decisions are enforced by penalties on those that violate them.” *The Costs of Accidents* at 69.
choose one thing we give up others. General deterrence attempts to force individuals to consider accident costs in choosing among activities. The problem is getting the best combination of choices available. The general deterrence approach would let the free market or price system tally the choices. 48

The barrier to efficient free-market choices in the context of automobile accidents which this Article identifies is that traditional insurance prices are inherently incapable of providing accurate individual costs. 49 Therefore, the first step in redeeming Calabresi’s vision that auto insurance costs must guide decisions is to acknowledge that auto insurance charged as an ownership cost produces nothing but wrong incentives for optimizing the costs of accidents.

48 Idem.

49 It might be argued that this Article unjustly faults insurers for not accomplishing the impossible task of evaluating individual differences in negligence. Recall that the model in Part II assumes that the entire difference in annual accident cost between Taney and Marshall is due to a difference in annual miles. But if the cars were assumed to be driven the same annual miles, the entire difference could be attributed to an unobservable difference in their negligence rates per mile. Formally, this alternative assumption should have equal status with the adopted assumption of observable miles-exposure difference because the annual costs Calabresi specifies can be expressed as the product of two variables: annual miles times a cents-per-mile risk (or negligence) rate. But recent analysis of well-established insurance fact comes down strongly on the side of a difference in annual miles to explain a difference in annual risk (all else of course, like driver age, made equal by classification). See Patrick Butler, “Proof That Auto Insurance Rating by Accident Record Predicts Miles Not Negligence: Fault Is Predictively Irrelevant.” Presentation, Western Risk and Insurance Association Annual Meeting (January, 2005).
Bibliography


