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Kyle D. Logue

University of Michigan Law School, klogue@umich.edu

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THE DETERRENCE CASE FOR COMPREHENSIVE AUTOMAKER ENTERPRISE LIABILITY

KYLE D. LOGUE[†]

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I. INTRODUCTION

Automobiles are much safer today than they used to be. Perhaps the best illustration of this fact is the decades' long decline in the number of auto-related deaths per-mile-driven.¹ And yet motor vehicles—including cars, trucks, and SUVs—continue to be among the most dangerous products sold anywhere. Automobiles pose a larger risk of accidental death than any other product, except perhaps for opioids.² Annual auto-crash deaths in the United

[†] Douglas A. Kahn Collegiate Professor of Law, University of Michigan Law School. Professor Logue received helpful suggestions on the ideas in this Article from numerous participants at a conference on Traffic Accident Liability and the Future of Autonomous Vehicles held at Wake Forest University School of Law and from his Michigan Law colleagues at a Fawley Lunch Workshop in Ann Arbor. Thanks also to Bryant Walker Smith for his comments and notes.

1. *General Statistics: Fatality Facts*, INS. INST. FOR HIGHWAY SAFETY: HIGHWAY LOSS DATA INST., <https://www.iihs.org/iihs/topics/t/general-statistics/fatalityfacts/overview-of-fatality-facts> (last visited Nov. 13, 2018) (showing motor vehicle crash deaths per 100 million miles driven has declined from 3.35 in 1976 to 1.18 in 2016).

2. In 2016, which is the most recent year for which the Centers for Disease Control has final data as of the time of this writing, there were 58,335 deaths attributable to accidental poisoning, which includes accidental deaths from drug overdose (which, of course, includes accidental opioid overdose). JIAQUAN XU ET AL., CTRS. FOR DISEASE CONTROL & PREVENTION, NATIONAL VITAL STATISTICS REPORTS 34 (vol. 67, no. 5 July 26, 2018) [henceforth, *CDC, 2016 Final Death data*]. The CDC estimates that roughly 42,000 deaths in 2016 were attributable to opioids, the vast majority of which would presumably be considered accidental deaths. *Drug Overdose Death Data*, CTRS. FOR DISEASE CONTROL & PREVENTION, <https://www.cdc.gov/drugoverdose/data/statedeaths>

States have never fallen below 30,000, reaching a recent peak of roughly 40,000 in 2016.³ In addition to these tens of thousands (internationally, millions⁴) of deaths attributable to motor-vehicle crashes, there are many other social costs. Victims of serious auto accidents, for example, often incur extraordinary medical expenses both to provide treatment immediately after the accident and, sometimes, to provide treatment for the rest of their lives.⁵ Those crash victims whose injuries render them unable to work can experience weeks, months, even years of lost income, which, from their employers' perspective, is lost productivity.⁶ Auto accidents also cause non-trivial amounts of property damage, mostly to the automobiles themselves though also occasionally to highways, bridges, or other elements of transportation infrastructure. Finally, serious motor vehicle accidents often cause severe noneconomic injuries—that is, severe “pain and suffering”—as a result of accident victims' painful and debilitating physical injuries. According to some estimates, such noneconomic harms, in the aggregate, amount to more than twice the magnitude of the aggregate economic damages caused by auto accidents.⁷

All of this may be about to change. According to many auto-industry experts, the eventual transition to driverless vehicles will drastically lower the economic and noneconomic costs of auto accidents.⁸ Why might this be

[.html](#) (last visited Nov. 13, 2018). Note also that firearms are involved in more deaths per year than motor vehicles, but the vast majority of those deaths are caused intentionally, either suicide (22,938 deaths in 2016) or homicide (14,415). The other leading causes of accidental deaths that year included the following: falls (34,673), firearms (495), and drowning (3,786). *CDC, 2016 Final Death data*, at 50.

3. For 2016, there were 40,327 motor-vehicle-related accidental deaths. *CDC, 2016 Final Death data*, at 52.

4. Internationally, the number of annual fatalities attributable to motor vehicle accidents is in the millions. *Number of Road Traffic Deaths*, WORLD HEALTH ORG., http://www.who.int/gho/road_safety/mortality/number_text/en/ (last visited Nov. 13, 2018) (estimating worldwide auto accident deaths in 2013 to be roughly 1.25 million).

5. LAWRENCE BLINCOE ET AL., NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., *THE ECONOMIC AND SOCIETAL IMPACT OF MOTOR VEHICLE CRASHES, 2010 (REVISED)* 5 (May 2015) (finding medical costs responsible for \$23.4 billion of the total economic cost of motor vehicle crashes in 2010).

6. *Id.* (finding \$77.4 billion in lost productivity as a result of motor vehicle crashes in 2010).

7. DANIEL SMITH, NAT'L HIGHWAY TRAFFIC SAFETY ADMIN., *OVERVIEW OF NHTSA PRIORITY PLAN FOR VEHICLE SAFETY AND FUEL ECONOMY, 2015 TO 2017* at 2 (June 2015) (“In addition to the terrible personal toll, these crashes have a huge economic impact on our society with an estimated annual cost of \$242 billion, which is an average of \$784 for every person in the United States. These crashes also result in \$594 billion in societal harm from loss of life and the pain and decreased quality of life due to injuries.”).

8. See, e.g., Adrienne LaFrance, *Self-Driving Cars Could Save 300,000 Lives Per Decade in America*, THE ATLANTIC (Sept. 29, 2015), <https://www.theatlantic.com/technology/archive/2015/09/self-driving-cars-could-save-300000-lives-per-decade-in->

so? Because humans are so bad at driving. When it comes to operating motor vehicles, people have bad judgment, slow reflexes, inadequate skills, and short attention spans. They drive too fast. They drive while intoxicated. They drive while sleepy. They drive while distracted. In fact, according to the National Highway Traffic Safety Administration, roughly 94 percent of auto accidents today are attributable to “driver error.”⁹ Computers can do better. At least that is the hope: that machine-learning computer algorithms, in combination with state-of-the-art sensors and advanced robotics, will be better—much better—drivers than humans are.¹⁰ Whether this will in fact be true is still unproven, but is most likely to be true with respect to so-called fully driverless “Level 5” vehicles,¹¹ which are those autonomous or connected vehicles that are capable of operating on any road and under any conditions that a human driver can handle but with no input from a human passenger other than the choice of destination.¹² Level 5 vehicles, because they would not suffer from the problems that plague human decision making in the driving context, do hold the promise to be substantially safer than the fully or even partially human-driven alternative.¹³

[america/407956/](#) (“Researchers estimate that driverless cars could, by midcentury, reduce traffic fatalities by up to 90 percent.”).

9. NAT’L HIGHWAY TRAFFIC SAFETY ADMIN., CRITICAL REASONS FOR CRASHES INVESTIGATED IN THE NATIONAL MOTOR VEHICLE CRASH CAUSATION SURVEY 2 (Mar. 2018), <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812506>. Another 2 percent of accidents are attributable to vehicle component failure, 2 percent to environmental conditions (such as slick roads), and 2 percent to “unknown.” *Id.* What precisely these statistics mean, however, is not entirely clear. Specifically, it is not obvious how NHTSA’s statistical categories (such as “vehicle component failure”) would relate to analogous legal concepts (such as “defective product”).

10. For an extended argument for why driverless cars are better drivers than humans, see, e.g., HOD LIPSON & MELBA KURMAN, DRIVERLESS: INTELLIGENT CARS AND THE ROAD AHEAD (MIT Press 2016).

11. See *infra* note 12. Level 5 vehicles are also sometimes called autonomous vehicles, though that use of the term ignores the distinction between connected vehicles and truly autonomous vehicles. This Article will largely ignore that distinction as well.

12. It is these Level 5 vehicles that hold the real promise for substantial accident-risk reduction. SAE INTERNATIONAL, TAXONOMY AND DEFINITIONS FOR TERMS RELATED TO DRIVING AUTOMATION SYSTEMS FOR ON-ROAD MOTOR VEHICLES J3016 (2018), https://saemobilus.sae.org/content/j3016_201806 (explaining levels 0, no autonomous features, through level 5, where a computer is “operating the vehicle on-road anywhere that a typically skilled human driver can reasonably operate a conventional vehicle”). This is in large part because Level 5 vehicles do not have the “handoff problem,” which occurs at that moment (with levels 1 through 4) when control of the vehicle must be transferred from the algorithm to the human driver. Alex Davies, *The Very Human Problem Blocking the Path to Self-Driving Cars*, WIRED (Jan. 1, 2017), <https://www.wired.com/2017/01/human-problem-blocking-path-self-driving-cars/> (discussing how existence of handoff problem led Google, in 2012, and other companies more recently, to commit to developing level 5 autonomy).

13. One can certainly imagine the possibility of driving algorithms going haywire or

As promising as a world of highways filled with computer-driven vehicles might be, from an accident-reduction perspective,¹⁴ such a high-tech world is still only a possibility. And even if it happens, it will not be for a number of years. There continue to be major technological hurdles, as well as potential consumer resistance to actually riding in a driverless vehicle.¹⁵ Therefore, the introduction, spread, and eventual dominance of Level 5s will take some time.¹⁶ During that transition, most automobiles will continue to be driven mostly by humans. Indeed, even in the long run, when Level 5 vehicles have been perfected and are available to the general public either through individual purchases and leases or through some ride-sharing arrangement (via Uber or Lyft or some similar web-based platform), we should still expect to see a substantial number of fully or partially human-driven vehicles traveling alongside them.¹⁷

If I am right about this picture of the automotive future, what should the role of auto tort law be, now and going forward? More specifically, if we conceive of auto tort law—including both automaker product liability and driver negligence liability (and the insurance that covers both types of liability)—as a system of ex post auto-crash deterrence, what would the optimal or efficient auto tort/insurance regime look like?¹⁸ Further, how

sensors failing in ways that cause terrible accidents. But presumably, regulators will not permit Level 5s to be sold until they prove themselves in large numbers of test miles to be substantially safer than human drivers. Some commentators have suggested that regulators not approve Level 5s unless and until they are shown to be twice as safe as human drivers. Mark A. Geistfeld, *A Roadmap for Autonomous Vehicles: State Tort Liability, Automobile Insurance, and Federal Safety Regulation*, 105 CALIF. L. REV. 1611, 1653 (2017).

14. If the advent of autonomous and connected vehicles means more vehicles on the road, it could be bad news for efforts to combat climate change and improve air quality.

15. *American Drivers Grow More Afraid of Driverless Vehicles*, INS. J. (May 22, 2018), <https://www.insurancejournal.com/news/national/2018/05/22/490014.htm> (noting that 73% of American drivers report being too afraid to ride in a fully automated vehicle).

16. Many experts think consumers will not even be able to purchase fully autonomous vehicles for another decade. Justin Gerdes, *Not So Fast. Fully Autonomous Vehicles are More than a Decade Away, Experts Say*, GREEN TECH MEDIA (Feb. 6, 2018), <https://www.greentechmedia.com/articles/read/fully-autonomous-vehicles-decade-away-experts> (reporting results of informal poll of 300 industry experts).

17. See, e.g., *Background On: Self-Driving Cars and Insurance*, INS. INFO. INST. (July 30, 2018), <https://www.iii.org/article/background-on-self-driving-cars-and-insurance> (“According to the Insurance Institute for Highway Safety, it is anticipated that there will be 3.5 million self-driving vehicles on U.S. roads by 2025, and 4.5 million by 2030. However, the institute cautioned that these vehicles would not be fully autonomous, but would operate autonomously under certain conditions.”).

18. For this Article, I assume that the primary role of auto tort law is efficient deterrence. That means, creating incentives that induce all relevant parties—drivers, automakers, even pedestrians—to take efficient or cost-justified steps to minimize the probability and severity of accidents. On this view, the goal is not necessarily zero

should such an optimally designed auto tort/insurance regime take into account the emergence of Level 5 vehicles?

These questions are the subject of this Article. Specifically, this Article lays out the potential (at this point purely theoretical) deterrence benefits of replacing our current auto tort regime (including auto products liability law, driver-based negligence claims, and auto no-fault regimes) with a single, comprehensive automaker enterprise liability system.¹⁹ This new regime would apply not only to Level 5 vehicles, but to *all automobiles* made and sold to be driven on public roads.²⁰ Because such a system would make automakers unconditionally responsible for the economic losses resulting from any crashes of their vehicles, it would in effect make automakers into auto insurers as well, although such a change will likely lead to some restructuring in how automobiles are insured and sold. Or so I will argue.

My basic argument is that a comprehensive automaker enterprise liability regime may have previously unexplored, or at least forgotten, deterrence

accidents, because the cost of accident avoidance eventually renders additional investments in accident prevention inefficient and socially undesirable. This is a standard type of normative analysis of accident law. It is, of course, not the only way to evaluate an accident law regime. For example, if the primary function of auto tort law were instead merely compensation for the harms caused by auto accidents, or were to achieve corrective justice (in the sense of reversing wrongfully caused harms), some system other than the one proposed in this Article might make more sense.

19. The term “enterprise liability” has long been used to stand for the idea that “business enterprises ought to be responsible for losses resulting from products they introduce into society.” George L. Priest, *The Invention of Enterprise Liability: A Political History of The Intellectual Foundations of Modern Tort Law*, 14 J. LEGAL STUD. 461, 463 (1985) (describing intellectual history of enterprise liability idea). See also Gregory C. Keating, *The Theory of Enterprise Liability and Common Law Strict Liability*, 54 VAND. L. REV. 1285, 1287 (2001) (“[E]nterprise liability expresses the maxim that those who profit from the imposition of risk should bear the costs of the accidents that are a price of their profits.”). The concept of enterprise liability was much discussed in the 1980s and 1990s among tort scholars. See, e.g., Priest, *supra*; James A. Henderson Jr. *The Boundary Problems of Enterprise Liability*, 41 MD L. REV. 659 (1982) (discussing line-drawing issues that arise in connection with adopting enterprise liability regimes); and Kenneth S. Abraham & Paul C. Weiler, *Enterprise Medical Liability and the Evolution of the American Health Care System*, 108 HARV. L. REV. 381 (1994) (applying enterprise liability concepts to medical system). I, together with my colleagues and friends Jon Hanson and Steve Croley, started writing about enterprise liability around this time. See, e.g., Jon D. Hanson & Kyle D. Logue, *The First-Party Insurance Externality: An Economic Justification for Enterprise Liability*, 76 CORNELL L. REV. 129 (1990); and Steven P. Croley & Jon D. Hanson, *Rescuing the Revolution: The Revived Case for Enterprise Liability*, 91 MICH. L. REV. 683 (1993).

20. For a more recent proposal to create a special auto-manufacturer responsibility regime, which has similarities to the one I am describing here, but that—critically—would be limited to accidents involving fully automated vehicles, see Kenneth S. Abraham & Robert L. Rabin, *Automated Vehicles and Manufacturer Responsibility for Accidents: A New Legal Regime for a New Era*, 105 VA. L. REV. (forthcoming 2019).

benefits.²¹ First, it could greatly simplify our existing auto tort regime by replacing all of automaker liability law (including product design defect claims) and driver liability law (as well as existing no-fault regime) with a single enterprise liability regime under which all auto-accident victims could seek recovery. Second, it could encourage automakers to design and manufacture safer vehicles, whether that means safer human-driven vehicles (with automated features) or Level 5 vehicles. Third, it could incentivize automakers to provide better warnings and instructions with their vehicles, including better ways to deal with the “hand off” problem that occurs when vehicles switch from semi-self-driving mode to human-driven mode.²² Fourth, enterprise liability could result in automobile prices that better reflect the actual costs of driving, leading to more optimal levels of auto sales and miles driven. Fifth, enterprise liability could induce auto companies to coordinate (in a way they are not presently coordinating) with the one industry that has more information than the auto companies have about how the specific driving patterns of individual human drivers affect the risk of auto accidents: namely, the auto insurance industry. Finally, a comprehensive automaker enterprise liability regime would provide an implicit subsidy for the development and deployment of driverless technology, but only to the extent that automakers actually expect such technology to reduce accident costs. All of these points will be developed below.

The argument will proceed as follows. Part II evaluates existing auto tort law—including automaker liability law and driver liability law—from the perspective of optimal deterrence. Part III outlines one plausible version of a comprehensive automaker enterprise liability regime and summarizes the primary deterrence advantages of such a regime. Part IV briefly concludes with a discussion of caveats, concerns, and a list of questions for future research.

21. In an article published in 1985, Professor Howard Latin outlined an automaker enterprise liability proposal similar to the one I am describing in this Article. Howard A. Latin, *Problem-Solving Behavior and Theories of Tort Liability*, 73 CAL. L. REV. 677 (1985). That article, brought to my attention by Professor Stephen Sugarman, also makes a deterrence case for adopting an automaker enterprise liability regime, emphasizing some (though not all) of the same arguments I make here. *See also* Bryant Walker Smith, *Regulation and the Risk of Inaction*, in AUTONOMOUS DRIVING 584 (Markus Maurer, et al. eds., 2016), https://link.springer.com/chapter/10.1007/978-3-662-48847-8_27 (exploring (very briefly) the idea of using auto enterprise liability as a means of encouraging automotive safety innovation).

22. Steven Ashley, Level 3 “Hand Off” is Challenging AI Researchers, SAE INT’L (Jan. 17, 2017), <https://www.sae.org/news/2017/01/sae-level-3-hand-off-is-challenging-ai-researchers>.

II. EVALUATING THE DETERRENCE IMPLICATIONS OF CURRENT AUTO
TORT LAW

Automaker Liability Law

To understand the deterrence benefits of an auto enterprise liability regime, it is necessary first to understand the deterrence consequences of the current auto tort regime. To that end, this Part describes the current auto tort system—both automaker liability law and driver liability law—and, drawing on well-known insights from deterrence theory and economic analysis of liability rules, explores what the general deterrence consequences of that regime might be. This is an entirely theoretical discussion. The ultimate question—which auto tort regime comes closest to minimizing the costs of auto accidents—can of course only be answered with empirical research that is beyond the scope of this short paper.

Current automaker liability law, like manufacturer liability law generally, is primarily a negligence-based regime, by which I mean the following: Under current law in most U.S. jurisdictions, individuals who suffer harm caused in an automobile crash can recover from the automaker in tort if they can prove that the harm resulted from negligence (or a lack of reasonable care) on the part of the automaker in designing or constructing the vehicle.²³ Alternatively, auto accident victims can invoke modern products liability doctrine and argue that a “defect” in the vehicle’s design, manufacturing process, or warnings caused the harm.²⁴ This latter approach also typically requires some showing of automaker negligence. This is because, in the bulk of U.S. jurisdictions, important aspects of the product defect law are equivalent to negligence law.²⁵ For this reason, auto products-liability,

23. See, e.g., *Larsen v. GM*, 391 F.2d 495, 504 (1968) (holding, among other things, that auto manufacturers have a duty to use reasonable care in design and construction of vehicles).

24. RESTATEMENT (THIRD) TORTS: PROD. LIAB. §§1 & 2 (AM. LAW INST. 1998) (setting forth general rules for liability resulting from product defects).

25. A majority of jurisdictions apply a risk-utility version of the design defect test, which is similar to the common cost-benefit formulations of negligence. RESTATEMENT (THIRD) TORTS: PROD. LIAB., §2, cmt. D (AM. LAW INST. 1998). Moreover, the adequacy of product warnings is often evaluated according to a negligence-based reasonableness test. RESTATEMENT (THIRD) TORTS: LIABILITY FOR PHYSICAL AND EMOTIONAL HARM, § 3 (AM. LAW INST. 1998). Also, in the jurisdictions that define design defect according to “reasonable consumer expectations,” there is an obvious reliance on negligence-based principles as well, such as the concept of reasonableness. Current products liability law with respect to warnings is also essentially a negligence-based regime. RESTATEMENT (THIRD) TORTS: PROD. LIAB., §2, cmt. I (AM. LAW INST. 1998). (“Commercial product sellers must provide reasonable instructions and warnings about risks of injury posed by products.”).

despite sometimes being labeled a form of “strict liability,”²⁶ is in fact largely a form of negligence liability.²⁷

A negligence-based automaker liability regime can in theory have certain deterrence advantages, if one makes particular assumptions. Those assumptions, however, are keys to the analysis—and do not always apply. For starters, a negligence-based automaker liability regime can create efficient incentives with respect to automaker care levels. Automaker “care levels” are the precautions taken by automakers—in the design, production, and warnings with respect to their vehicles—that reduce the probability or severity of auto accidents.²⁸ *Efficient* automaker care levels occur when the

26. For an example of lawyers characterizing auto products liability generally, including design defect and warning defect claims, as a form of “strict liability,” see, e.g., DEREK H. SWANSON & LIN WEI, MCGUIREWOODS, UNITED STATES AUTOMOTIVE PRODUCTS LIABILITY LAW 7 (2009), <https://www.mcguirewoods.com/news-resources/publications/us-automotive-products-liability.pdf>.

27. I am of course not the first person to observe that modern “strict” products liability operates in practice largely as a negligence regime. See, e.g., DAVID G. OWEN, PRODUCTS LIABILITY LAW 38 (3rd ed. 2015) (“These two propositions—that manufacturers must guard against risks only if they are *foreseeable*, and that manufacturers must guard against those risks only with precautions that are *reasonable*—are the two major pillars of modern products liability law in America.”). This is not to say that there are no aspects of strict liability in the current auto products liability system. For example, manufacturing defect cases approximate true strict liability. That is, when the product’s design satisfies the risk-utility standard (or is, in a sense, reasonable or non-negligent) but the particular product that caused the harm in the case did so as a result of some sort of malfunction in the vehicle that is not a result of negligent maintenance on the part of the vehicle owner (e.g., the brakes or the steering mechanism simply fails), the automaker is strictly liable. With respect to Level 5 vehicles, presumably a much higher percentage of the accidents would be a result of vehicular malfunction than is the case with human-drive vehicles; thus, there would be a much larger domain of true strict liability if existing product liability doctrine were applied to Level 5 accidents than is currently the case with automaker liability cases. Further, in design defect jurisdictions that apply a consumer expectations test, strict liability also seems likely, assuming courts conclude that consumers reasonably expect Level 5s not to crash. Still, there would be some negligence-based liability with respect to the design of the vehicles and the algorithm that drives them. See, e.g., Bryant Walker Smith, *Automated Driving and Product Liability*, 2017 MICH. ST. L. REV. 1 (2017) (noting that, applying existing law, automaker liability for Level 5 accidents will likely turn on some version of “unreasonable performance” by the vehicle, which sometimes will approximate strict liability and sometimes negligence); and Mark A. Geistfeld, *A Roadmap for Autonomous Vehicles: State Tort Liability, Automobile Insurance, and Federal Safety Regulation*, 105 CAL. L. REV. (forthcoming 2018) (observing that applying existing products liability law to Level 5s will sometimes result in strict liability and sometimes negligence-based liability).

28. See generally STEVEN SHAVELL, ECONOMIC ANALYSIS OF ACCIDENT LAW 73–85 (1987) (comparing theoretical deterrence benefits of negligence liability rule and strict liability rule, in terms of care levels and activity levels); WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF TORT LAW 54–84 (1987) (same); and A. MITCHELL POLINSKY, AN INTRODUCTION TO LAW AND ECONOMICS 113–123 (3rd ed. 2003) (discussing choice of optimal products liability rules in particular).

automaker has made all available investments in care—in crash-risk reduction—that reduce expected auto-accident costs by more than the marginal costs of the additional care.²⁹ Thus, an efficient negligence-based tort liability rule would hold an automaker liable for the harms resulting from a given auto accident only if that automaker failed to take efficient care. For example, if there was an alternative automotive design or alternative warning that the automaker could have used that would have reduced expected accident costs by more than the marginal costs of that design or warning change, failing to deploy that alternative design or warning in their vehicles would constitute negligence on the part of the automaker, and would therefore be potential grounds for tort liability.³⁰

This sort of efficient negligence-based liability rule would induce automakers to take efficient care if we assume the following to be true: (a) that automakers are aware of the law and respond rationally to it, and (b) that courts applying a negligence-based automaker liability rules perform a thorough and accurate cost-benefit analysis (for example, judges and juries do not tend to make systematic errors in their determinations regarding what constitutes automaker negligence or what counts as a design defect). Under those assumptions, the negligence-based regime would incentivize efficient automaker care levels. Why? Because automakers would under those assumptions realize that they can avoid negligence-based liability entirely if they merely make all cost-justified investments in auto safety (e.g., all cost-justified design and warning changes). Knowing this, they would have a strong legal and financial incentives to do just that.³¹

In addition, a negligence-based automaker liability regime can also create incentives for efficient driver care-levels—incentives for drivers to drive reasonably carefully—even in the absence of a defense of contributory negligence or comparative fault.³² This is because a negligence-based regime, by its nature, leaves accident costs on victims and their insurers when the automaker is not negligent. That fact will induce drivers to drive carefully, so as to minimize their own risk of uncompensated accident losses. Again, however, this conclusion holds only if certain key assumptions are also true. Specifically, we must assume the following: a) that drivers, like automakers, are knowledgeable about tort law and respond rationally to the

29. Put differently, when an automaker is investing efficiently in care, there are no additional investments in accident reduction that could be made that would reduce expected accident costs by more than the costs of accident avoidance.

30. The plaintiff must also demonstrate causation.

31. This insight is simply an application of a standard conclusion regarding the effects on injurer care levels of a perfectly applied negligence rule. *See generally supra* sources cited in note 28.

32. *See generally supra* sources cited in note 28.

potential of tort rules to apply to their future conduct; and b) that drivers actually bear these costs and do not externalize them to someone else.

To put all of this together, according to standard deterrence theory, an efficiently and accurately applied negligence-based automaker liability rule can produce efficient incentives for both automakers and drivers to take care to avoid auto accidents.³³

But there are obvious problems with this rosy picture. First, consider the effects on automaker care levels if we relax the assumption that courts accurately apply negligence-based standards. If judges and juries are not very good at doing the complex and information-intensive analysis necessary to determine what particular automotive designs, warnings, or instructions are cost-justified or reasonable (or not defective), the outcomes of courts' negligence determinations become highly uncertain. This can in turn produce incentives for automakers both to over-invest and to under-invest in auto safety.³⁴

The incentive to over-invest in auto safety can arise when manufacturers expect courts to set the standard of reasonable care (or a non-defective design) inefficiently high—that is, when manufacturers expect that courts may find a design defect notwithstanding the fact that the automaker's design decisions were consistent with an accurate, objective, comprehensive risk-utility test. If that is the expectation, then automakers would have an incentive to satisfy the inefficiently high court- or jury-imposed design standard (or warning standard) in order to avoid liability. The incentive to under-invest in safety can arise if courts rely too much on custom within the industry as their source for what constitutes reasonable care, or a non-defective design or warning. This is because industry custom can (famously) lag behind what is truly efficient levels of safety.³⁵ It is not a surprise, then, that commentators have argued that custom-based standards of care, like those that currently apply to automaker liability, can inhibit innovation.³⁶

33. See generally *supra* sources cited in note 28. This conclusion also assumes that automakers are well informed about and respond rationally to tort liability rules.

34. See generally Mark Grady, *A New Positive Economic Theory of Negligence*, 92 Yale L.J. 799 (1983); and John Calfee & Richard Craswell, *Some Effects of Uncertainty on Compliance with Legal Standards*, 70 Va. L. Rev. 965, 982 (1984).

35. The T.J. Hooper, 60 F.2d 737 (2d Cir. 1937) (“a whole calling may have unduly lagged in the adoption of new and available devices”). In product liability design defect cases, of course, courts do not generally permit compliance with industry custom to be totally exculpatory; however, it can be considered relevant to the risk-utility negligence-based balancing test. See, e.g., *Carter v. Massey-Ferguson, Inc.*, 716 F.2d 344 (5th Cir. 1983). However, if a defendant in a negligence-based product liability regime has adopted a design that is the safest in use at the time of manufacturing, it may be difficult for the plaintiff to prevail. See RESTATEMENT (THIRD) TORTS: PROD. LIAB., §2, cmt. D (AM. LAW. INST. 1998).

36. See, e.g., Gideon Parchomovsky & Alex Stein, *Tort and Innovation*, 107 Mich.

A second problem with a negligence-based auto products liability regime has to do with driver care levels. For a negligence-based regime to efficiently incentivize drivers to drive carefully (by imposing on drivers the risk of accidents that are not cost-justifiably preventable by the manufacturer), recall that we assumed that drivers are well informed of both accident risks and how those risks are allocated according to the specific rules of auto tort law. Those assumptions are obviously unrealistic. Drivers simply are not aware of the tort law rules that apply to them or the product liability rules that apply to automakers. Moreover, even when drivers do know about accident risks and legal rules, there are reasons to believe (discussed below)³⁷ either that drivers will not respond rationally to that information or that they will externalize those risks to insurance companies. If I am right about that—about drivers’ lack of information about driving risk and auto tort law, and about their cognitive biases and cost-externalization—then the ability of a negligence-based auto products liability regime to optimize driver care levels is substantially undermined. Legally imposing costs on drivers would not, or at least may not, have the desired deterrence effect on driver care levels.³⁸

The final deterrence problem with a negligence-based auto products liability regime would exist even if judges and juries were good (accurate and unbiased) at applying risk-utility or cost-benefit standards. In fact, this problem results *because* automakers would expect accurate application of the negligence-based rules. The problem involves the effect of a negligence-based automaker liability rule on the number of vehicles sold, or, in the language of deterrence, the effect on automaker “activity levels.”³⁹ Even an efficiently safe car (one with no defects whatsoever) that is driven carefully by its human or algorithmic driver poses some residual or irreducible risk of crashing. This residual risk will have a tendency to be ignored or externalized by automakers under a negligence-based product liability regime because automakers can virtually insulate themselves against liability by merely

L. Rev. 285 (2008).

37. *See infra*, discussion at notes 44–48 and 51.

38. By contrast, the assumption that automobile manufacturers—with their teams of expert engineers, lawyers, and accountants—are fully informed of the torts liability regime in which they operate and how those rules are likely to affect them. This claim—that auto manufacturers are likely to be better informed (both about the risks of auto accidents and about the relevant liability rules) and more classically rational in their decision-making than drivers—is not new. *See, e.g.,* Latin, *supra* note 21, at 692–93 (arguing that, because drivers are much less likely to know about and respond rationally to having auto-accident losses imposed on them than auto manufacturers are, a regime of auto-manufacturer enterprise liability could produce an overall improvement in social welfare, through a reduction in overall auto accidents).

39. *See supra* sources cited in note 28.

complying with the liability standard.⁴⁰ The result of this externality is that the scale of operation in the auto industry—the number of cars sold—may be higher than the social-welfare maximizing level, even ignoring the effect of automobile emissions on the environment, because the price of vehicles does not include this cost of unpreventable auto accidents.

To summarize, given how our current negligence-based automaker liability regime is applied in practice, there are reasons to be concerned that automaker and driver care levels may be too low and activity levels too high. What's more, this concern would apply not only to human-driven vehicles, but to Level 5 vehicles as well. That is, there is nothing about the nature of Level 5 vehicles that would suggest these problems are less likely to be present than would be the case for human-driven vehicles.⁴¹ This activity-level inefficiency associated with current automaker liability law has been totally ignored by those who have argued in favor of applying existing product liability standards, or revised but still negligence-based versions of existing product liability standards, to Level 5 vehicles.

Driver Liability Law

In a majority of states in the U.S., if someone is injured or suffers property damage as a result of a driver's negligent operation of an automobile, rather than as a result of automaker negligence, the victim may recover from the negligent driver under standard common-law principles of tort.⁴² The victim must demonstrate that the harm to her was a result of the driver's failure to do something that a reasonable driver would have done under the circumstances, or the drivers' doing something that a reasonable driver under the circumstances would not have done.⁴³ Accident victims who can recover include pedestrians, cyclists, passengers, or other drivers—anyone who is

40. See *supra* sources cited in note 28. Of course, this automaker activity level effect is mitigated to some extent when automakers except to be held liable by courts despite having taken reasonable care. These effects are unlikely, however, to be perfectly offsetting.

41. With Level 5 vehicles, if there were a problem with “driver care levels,” it would be a problem automaker care levels. That is, with Level 5s, driver care levels are, by definition, included as a part of manufacturer care level.

42. For a summary of emergence of fault-based and no-fault auto liability/insurance systems, see JAMES M. ANDERSON, PAUL HEATON, SEPHEN J. CARROLL, THE U.S. EXPERIENCE WITH NO-FAULT AUTOMOBILE INSURANCE: A RETROSPECTIVE 19–61 (2010), https://www.rand.org/content/dam/rand/pubs/monographs/2010/RAND_MG860.pdf.

43. RESTATEMENT (SECOND) OF TORTS § 284 (defining negligent conduct in terms of what reasonably prudent person would do or not do); see also RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL AND EMOTIONAL HARM, § 3 cmt. h (Am. Law. Inst. 1998) (“Many cases say that negligence consists of “the failure to do something which a reasonably careful person would do, [or] the doing of something which a reasonably careful person would not do.””) (citations omitted).

harmful as a result of driver negligence.

Because driver liability is also a negligence-based regime, it has similar potential to provide efficient deterrence as does a negligence-based automaker liability regime. Specifically, negligence-based driver liability law can have beneficial deterrence effects on driver care levels, if we make the following assumptions:

- Drivers are well informed about accident risks (and how their behavioral changes affect those accident risks),
- Drivers are well-informed about the rules of tort law,
- Drivers internalize those risks (do not externalize them to insurers, for example), and
- Drivers process the information about those risks rationally (without any systematic cognitive biases), and we assume again that
- Courts are good at applying cost-benefit-type negligence-based liability rules.

If all of those assumptions are true, then, for the same reason that automakers would be incentivized by a negligence-based automaker liability regime, drivers too would be incentivized to drive with efficient care—in terms of driving speed, safe braking and passing practices, smart-phone usage (or non-usage), and the like. This is so because, by taking efficient care in driving, drivers would avoid liability for the accidents that nevertheless occur. Again, under a negligence-based regime, driving with efficient care can be seen as a type of insurance for drivers, a fact that—if all of the above-listed assumptions are true—would incentivize safe driving.

The reasons that this vision of negligence-based driver liability law do not describe reality should be clear at this point. The assumptions listed above on which the analysis depends almost certainly do not hold in the real world. While drivers may be generally aware of the broad outlines of the driver liability regime in their state (whether it is fault-based or no-fault), they likely do not understand what the precise implications of that fact are on their chances of being found liable in court for unsafe driving. What's more, the average driver, while generally and vaguely cognizant of the risks of driving, is almost certainly uneducated about the precise levels of risk associated with various aspects of driving—for example, precisely how much the chance of a crash is increased by texting while driving or changing lanes abruptly with no signal. In fact, there is a good chance that most drivers underestimate those risks.

Why would drivers tend to underestimate such risks? First, there is the long list of well-documented cognitive biases that affect how individuals

process information generally.⁴⁴ One famous example is the tendency of individuals to ignore the risk of very low probability events and underestimate the likelihood of some high probability events.⁴⁵ Auto-crash risks may similarly be ignored or underestimated.⁴⁶ Also, drivers are especially prone to overestimating their own driving ability and thus their own ability to avoid crashes.⁴⁷ Moreover, drivers not only underestimate their own likelihood of a crash relative to the average driver (which they do), they also overestimate their own likelihood of a crash relative to the actual probability.⁴⁸ For all of these reasons, a negligence-based driver liability

44. The sources here are many. A decent place to start would be the classic essay by Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, in *JUDGMENT UNDER UNCERTAINTY. HEURISTICS AND BIASES* 3 (Daniel Kahneman, Paul Slovic, & Amos Tversky eds., 1982). More recent summaries of the literature include DANIEL KAHNEMAN, *THINKING, FAST AND SLOW* (2011); and RICHARD H. THALER, *MISBEHAVING: THE MAKING OF BEHAVIORIAL ECONOMICS* (2015). A classic article summarizing the application of behavioral insights to law and economics is Christine Jolls, Cass R. Sunstein & Richard H. Thaler, *A Behavioral Approach to Law and Economics*, 50 *STAN. L. REV.* 1471 (1998).

45. For a summary of the relative behavioral literature as it relates to products liability, see Jon D. Hanson & Douglas A. Kysar, *Taking Behavioralism Seriously: the Problem of Market Manipulation*, 74 *N.Y.U. L. REV.* 630, 643–87 (1999). For early applications of behavioral insights to products liability law, see Latin, *supra* note 21; and Howard A. Latin, “Good” Warnings, Bad Products, and Cognitive Limitations, 41 *UCLA L. REV.* 1193, 1194–95 (1994). For a discussion of the findings on very low probability and high probability events, see Hanson & Kysar, *supra* note 45, at 716–20. Note that there is also research showing that consumers sometimes overestimate the risks of merely “low probability” events—those that fall between very low probability and high probability. *Id.* (discussing research summarized in *Enterprise Responsibility for Personal Injury*, 1 *A.L.I.* 230 (1991)).

46. Whether auto risks are more likely to be very low, merely low, or high probability events is not entirely clear. However, the most important insight of the Hanson & Kysar article is that, because product manufacturers—including automakers—have considerable influence over how consumers perceive the risk of their products (and because product manufacturers—including automakers—have a strong market incentive to ensure that consumers underestimate the risks of their products), there is every likelihood that consumers on balance underestimate the risks of auto accidents. *Id.* Moreover, Hanson & Kysar, in a follow up article, provide considerable anecdotal evidence of actual market manipulation of consumer risk perceptions by manufacturers. Jon D. Hanson & Douglas A. Kysar, *Taking Behavioralism Seriously: Some Evidence of Market Manipulation*, 112 *HARV. L. REV.* 1420, 1466 (1999).

47. This finding has proven robust over many years. See, e.g., Ola Svenson, *Are We All Less Risky and More Skillful Than Our Fellow Drivers?*, 47 *ACTA PSYCHOLOGICA* 143 (1981); Timo Lajunen & Heikki Summala, *Driving experience, personality, and skill and safety-motive dimensions in drivers’ self-assessments* 19 *PERSONALITY AND INDIVIDUAL DIFFERENCES* 307 (1995); A.F. Williams, *Views of US drivers about driving safety* 34 *J. SAFETY RES.* 491 (2003). See also Jolls et al., *supra*, at 1537–38 (discussing problem of “overoptimisim” among drivers); Hanson & Kysar, *Taking Behavioralism Seriously: A Response to Market Manipulation*, 6 *ROGER WILLIAMS L. REV.* 259, 354–55 (1999) (same).

48. Christine Jolls, *Behavioral Economics Analysis of Redistributive Legal Rules*, 51

regime, which relies on assumptions of informed and rational drivers to produce optimal driver care levels, may not produce the deterrence benefits that are predicted by deterrence theory.⁴⁹ In addition, it is commonly argued that drivers have many powerful incentives to drive carefully even in the absence of a negligence-based regime that left on them the uninsured costs of auto accidents, incentives such as the desire to avoid a traffic fines or, more importantly, a crash that could be painful or even fatal to them or their loved ones.⁵⁰

How does this pessimistic picture of driver liability law as a system of incentivizing good driving change if we introduce auto insurance? The answer to that question turns out to be complicated. On one hand, automobile insurance has the potential to correct some of these deterrence-related problems.⁵¹ Here's why. Auto insurers are, unlike most drivers, extremely well informed about the intricacies of accident law. They employ teams of lawyers whose job is to understand how driver liability laws in each state affect the liability risks of their customers. Indeed, their profitability and their survival as going concerns depend on this expert understanding of the auto liability laws of all sorts. In addition, auto insurers have unparalleled access to enormous amounts of detailed information regarding the crash-risk characteristics of millions of drivers and automobiles. This is the result of decades of experience providing auto insurance coverage to hundreds of millions of drivers and vehicles, which in turn means pricing millions of auto insurance policies and adjusting millions of auto-crash claims over the years. No other institution or organization would have the same amount of driver-specific, automobile-specific data, as would the auto insurance industry.

In addition, recent innovations in “telematics” (which combines

VAND. L. REV. 1653, 1660 (citing Richard J. Arnould & Henry Grabowski, *Auto Safety Regulation: An Analysis of Market Failure*, 12 BELL J. ECON. 27, 34–35 (1981) and Colin F. Camerer & Howard Kunreuther, *Decision Processes for Low Probability Events: Policy Implications*, 8 J. POLY. ANALYSIS & MGMT. 565, 566 (1989)).

49. The evidence on whether negligence-based driver liability law reduces auto accidents, or the harms resulting from auto accidents, is probably best characterized as inconclusive. *See generally* Nora Freeman Engstrom, *An Alternative Explanation of No-Fault's Demise*, 61 DEPAUL L. REV. 303, 332–333 (2012) (“[R]oughly half of the studies published thus far claim that no-fault coverage increases fatal accidents, while the other half find no effect, and the notion that no-fault *reduces* fatalities has been seemingly put to rest.”) (footnotes omitted). The hope that a shift away from a negligence-based driver-liability regime would not substantially reduce auto accidents, along with the overall desire to lower auto insurance rates, was one of the original justifications for the movement towards auto no-fault regimes in the 1970s and 1980s. *Id.*

50. Latin, *supra* note 21, at 690–91; Engstrom, *supra* note 49, at 330.

51. *See generally* Omri Ben-Shahar & Kyle D. Logue, *Outsourcing Regulation: How Insurance Reduces Moral Hazard*, 111 MICH. L. REV. 197 (2012) (discussing ways that insurance companies help insureds reduce risk).

telecommunications, data science, and automotive technology) have increased auto insurers' ability to gather and analyze risk-relevant driver and vehicle data.⁵² With this new and emerging technology, not only do insurers have access to information regarding how drivers' past auto-claims and traffic-ticket histories affect their riskiness as drivers; they also have the ability to gather information on the effects of a range of specific driving behaviors on auto-crash risks.⁵³ For example, a number of insurers currently gather information about drivers' braking, acceleration, speeding, turning, and cornering behaviors and then send that information back to the insurers for analysis.⁵⁴ Once this driver-specific data is combined with data gather by insurers and others (including NHTSA) about what factors cause auto accidents generally, it becomes possible for auto insurers to link specific driving behaviors of particular drivers with premium discounts.⁵⁵

All of this information is to varying degrees already being taken into account by many auto insurance companies in the pricing of their insurance policies. For example, policy discounts are offered to drivers with good safety records⁵⁶ as well as for vehicles with particular safety features.⁵⁷ In addition, insurers are now offering discounts if drivers will improve their driving ability—for example, if they will take defensive driving classes.⁵⁸ Because of telematics revolution, auto insurers are even able to adjust premiums on the basis of the specific driving behavior of individual drivers. For example, some insurers give discounts for a range of driver-care-level factors such as wearing seatbelts, driving at moderate speeds, limiting late

52. *Background On: Pay-As-You-Drive Auto Insurance (Telematics)*, INS. INFO. INST., <https://www.iii.org/article/background-on-pay-as-you-drive-auto-insurance-telematics> (last visited Nov. 21, 2018).

53. *Id.* See also Ben-Shahar & Logue, *supra* note 51.

54. Yuanjing Yao, *Evolution of Insurance: A Telematics-Based Personal Auto Insurance Study*, U. CONN. HONORS SCHOLAR THESES, 590, 598 (2018), https://opencommons.uconn.edu/srhonors_theses/590/.

55. *Id.*

56. Most auto insurers give discounts for being accident free for a given period of time. *Car Insurance Discounts*, VALUEPENGUIN, <https://www.valuepenguin.com/car-insurance-discounts> (last visited Nov. 21, 2018). See also Yao, *supra* note 54 (discussing use of behavioral driving discounts among insurers).

57. One survey of the leading car insurers, found the following additional vehicle-safety-related discounts: passive restraint (25% to 30%), new car (10%), daytime running lights (around 3%). *Id.* Some insurers are starting to offer discounts for semi-autonomous features such as adaptive cruise control, collision avoidance systems, and lane departure warnings. Cherise Threewitt, *What Car Insurance Discounts Can I Get?*, U.S. NEWS & WORLD REP. (June 29, 2018), <https://cars.usnews.com/cars-trucks/car-insurance/car-insurance-discounts>.

58. *Car Insurance Discounts*, *supra* note 56 (reporting insurers giving discounts of 10% to 15% for completion of defensive driving courses).

night trips, and avoiding aggressive braking.⁵⁹ Also, the advances in telematics have made “pay as you go” auto insurance, under which premiums are a function of the number of miles driven, more accurate—and thus more prevalent—than ever before.⁶⁰ Driving-behavior-sensitive auto insurance premiums—which could take into account both good and bad driving choices (i.e., driver care levels) and, critically, the number of miles driven (i.e., driver activity levels)—hold the promise of incentivizing risk-reducing driving behavior in a way that even the most sophisticated government regulator could not hope to do.⁶¹

But here is the problem: Under current law and given existing market conditions, auto insurers do not have strong incentives to make full use of their comparative advantage at gathering risk-relevant information and pricing their insurance on the basis of that information, or at least there is reason to be concerned about their incentives to do so. The reason for concern is that the amount of coverage currently being provided by auto insurers presently represents only a fraction (in many cases a small fraction) of the total risks of auto crashes. This is true of first-party auto insurance coverage, which tends to cover only a fraction of the accident risks that any driver faces.⁶² It is also true of auto liability coverage, owing in part to the

59. *Id.* See also Barbara Marquand, *Comparing Drivewise, Snapshot and Other Usage-Based Insurance Plans*, NERDWALLET (Feb. 8, 2016), <https://www.nerdwallet.com/blog/insurance/comparing-drivewise-snapshot-usage-based-insurance/>.

60. *Usage-Based Insurance and Telematics*, NAT’L ASS’N OF INS. COMMISSIONERS (July 26, 2018), https://www.naic.org/cipr_topics/topic_usage_based_insurance.htm.

61. See generally Ben-Shahar & Logue, *supra* note 51 (discussing potential risk reducing benefits of high-tech auto-insurance pricing); Hanson & Logue, *supra* note 19, at 192–93 (suggesting reasons why auto insurance is better at risk-segregating than other types of first-party insurance). What little empirical research has been done on the subject tends to confirm that incentive-based insurance pricing tends to alter driving behavior in a risk-reducing direction. See Mark Stevenson et al., *The effects of feedback and incentive-based insurance on driving behaviours: study approach and protocols*, 24 INJ. PREVENTION, 89, 93 n. 27–30 (2018), <https://injuryprevention.bmj.com/content/24/1/89>; see also *Telematics Helps Reduce collisions and Claims*, AUTOMOTIVE FLEET (Nov. 10, 2017), <https://www.automotive-fleet.com/157806/telematics-helps-reduce-collisions-and-claims>.

62. This assertion requires some explanation. There are no good studies on this particular question. So my claim is derived from circumstantial evidence of a sort. First, note that, whereas all states require some amount of liability insurance coverage for anyone who drives on public roadways, only a small minority of states require drivers to purchase auto insurance that provides any sort of first-party medical or disability benefits. See, e.g., *Background on: Compulsory Auto/Uninsured Motorists*, INS. INFO. INST. (April 16, 2018), <https://www.iii.org/article/background-on-compulsory-auto-uninsured-motorists>. What’s more, even when there is mandated medical or disability coverage, the amount of required coverage is almost always far less than would potentially be recoverable under an auto tort claim, whether it be an automaker liability claim or a driver liability claim, and far less than the potentially enormous total costs (in

fact that the mandatory minimum amounts in most states are far less than the maximum harm threatened by an auto accident that results in even one serious injury or death.⁶³ As a result, many of the costs of auto accidents are currently being externalized to non-auto first-party health and disability insurers who—unlike auto insurers in the telematics age—do not tailor premiums at all based on their insureds' driving decisions.⁶⁴ Moreover, to the extent auto insurers do attempt to charge individualized, behaviorally- and risk-adjusted auto insurance rates (which, as I noted above, they are increasingly trying to do), this incentive is undermined by the fact that auto insurers cover only a fraction of the risks of auto accidents.⁶⁵

the millions) of any given auto accident. *Id.* (for example, noting mandatory amounts of bodily injury liability coverage ranging from \$15,000 to \$50,000 per person). Karl Eisenhower, *Personal Injury Protection: How PIP Insurance Works in Your State*, WALLETHUB (Jan. 9, 2015), <https://wallethub.com/edu/pip-insurance/9248/> (noting PIP mandates ranging from \$2000 per person in Utah to \$50,000 in New York.) The only state that requires unlimited PIP coverage is Michigan. *Id.* Further, even when drivers do purchase first-party medical or disability coverage through their auto-insurance policy, that coverage is often secondary to the victims' other forms of first-party health or disability insurance. For example, in some states requiring PIP coverage in auto policies, the insured can elect to make auto PIP coverage secondary to other first-party health and disability insurance. This is sometimes called the "coordination" option. MICH. DEPART. INS. & FIN. SERV., YOUR GUIDE TO AUTOMOBILE INSURANCE: FOR MICHIGAN CONSUMERS 10 (Sept. 2017), https://www.michigan.gov/documents/difs/Auto_Insurance_Guide_448003_7.pdf. Because making auto health insurance secondary lowers the insured's auto insurance premiums, and has little or no effect on her first-party health and disability insurance premiums, most insureds choose the coordination option, which means most insureds choose to make their non-auto first-party insurers primary. In sum, most auto health and disability risks end up being borne by non-auto first-party insurers—such as health insurers and disability insurers.

63. State mandated minimums for liability coverage for personal injuries to a single person range from a low of \$10,000 (Florida) to a high of \$50,000 (Alaska and Maine), and by for the most common minimum is \$25,000. *Car Insurance Laws by State*, FINDLAW, <https://injury.findlaw.com/car-accidents/car-insurance-laws-by-state.html> (last visited Nov. 19, 2018) (gathering links to state laws). A single accident resulting in serious bodily injury or death could easily produce economic losses alone in excess of \$1 million.

64. Most first-party health and disability insurers make no effort to price their coverage in a way that reflects the riskiness of insureds' driving choices—such as how they drive, how much they drive, or even what type of vehicle they drive. *See generally* Hanson & Logue, *supra* note 19 (using fact that most non-auto first-party insurers do not price-differentiate on basis of consumer product use to argue for enterprise liability for product accident risks). There is a perfectly sensible reason for this fact: the risks of auto-related health or disability claims are only a small fraction of the overall health and disability risks covered by any given first-party health or disability insurer. It is not worth the insurers' while to tailor their insurance premiums on the basis of any particular behavioral choice of their insureds, other than perhaps the choice to smoke or not. The result of all this: that portion of auto crash risks that are ultimately born by non-auto first-party insurers get externalized (or largely ignored) by drivers, with obvious deterrence consequences.

65. Because auto insurers do not bear all of the risks of auto accidents, the premium

It should also be noted, however, that there are important ways in which the allocation of auto-accident risks to non-auto first-party insurers has *cost-reducing advantages*. This may seem incongruous with the argument in the previous paragraph, but it is not: While auto insurers are in a good position, through premium discounts, to help optimize driver care and activity levels, auto insurers are not necessarily in a good position to minimize some other costs associated with providing insurance benefits. For example, primary health care coverage provided through auto insurance companies is almost certainly much more expensive than primary health care provided through regular non-auto first-party health insurers. This would be because, although auto insurers, in a sense, specialize increasingly in reducing driver ex ante moral hazard, it is non-auto health insurance companies who specialize in reducing ex post medical moral hazard—that is, excessive or wasteful use of the healthcare system.⁶⁶ My point here is only that the current division of auto-accident costs, allocating so little to auto insurers, may be non-optimal, given auto insurers potential ability to incentivize better (and less) driving.⁶⁷

To summarize, because of drivers' lack of accident-risk information and understanding of auto tort law and their susceptibility to cognitive biases,

discounts they are willing to offer to induce safer driving habits may not be adequate. The point can be illustrated with a simple example. Suppose there was some investment in driver care that cost \$50 but would reduce expected accident costs by \$80. Say it would reduce a chance of a \$200,000 loss from .001 to .0006. If the auto insurer bore the full \$200,000 risk, it would have an incentive to offer a premium discount to cover the cost of driver care, with an additional discount perhaps up to a total just short of the \$80 saved by the additional investment in driver care. But what if the auto-insurer bore only, say, \$40,000 of the \$200,000 potential loss? Then the largest discount it could offer without losing money would be \$16, which would be the amount of the savings in going from a .001 to a .0006 risk of, now, \$40,000 in covered losses. But that discount would *not* be enough to induce the consumer to make the investment in care, assuming the other \$160,000 in expected accident cost is externalized either because of drivers' underestimation of risk or because of non-adjusting non-auto first-party insurance coverage.

66. The claim that first-party health insurers specialize in trying to hold down health care costs may seem controversial, at least for fee-for-service policies. My claim is only that health insurers—especially ones that use managed care tools—are probably better at holding down ex post health care costs than are auto insurers. This is one of the reasons that auto no-fault regimes which make auto PIP coverage primary over non-auto first-party health coverage are so expensive, and why auto-no-fault regimes have not led to the cost savings that were expected. *See* Engstrom *supra* note 49. Professor Engstrom notes that “[m]edical insurers . . . reduce costs via discounts and fee schedules, and the limit patient treatment using any number of mechanism, including deductibles, co-payments, utilization controls, and medical protocols . . . , [a]uto insurers . . . tend to pay almost any bills that a victim incurs . . . dramatically increasing . . . the cost of care. *Id.* at 341 (citations omitted).

67. In Part III below, I suggest that, by adopting an automaker enterprise liability regime, automakers will have an incentive to strike the efficient balance between amount of auto-crash costs allocated to auto insurers and amount allocated to non-auto insurers.

and because of the presence of cost-externalizing insurance coverage, there is reason to be doubtful that the current negligence-based auto tort laws—automaker liability laws as well as driver liability laws—work to optimize driver care and activity levels. As discussed in the next Part, the adoption of an auto enterprise liability regime could in theory create incentives for automakers, together with auto insurers, to provide better driver-side incentives, as well as better automaker safety incentives.

III. THE AUTOMAKER ENTERPRISE LIABILITY ALTERNATIVE⁶⁸

The Basic Proposal

As an alternative to our current negligence-based auto tort regime, consider the possibility of a comprehensive automaker enterprise liability regime. Under such a regime, anyone who suffers a physical injury or property damage in an automobile accident—whether driver, passenger, or pedestrian—would be legally entitled to recover, from the manufacturer of the vehicle involved, compensation for the losses sustained as result of the accident.⁶⁹ Thus, to recover under this enterprise liability regime, accident victims would not be required to show negligence on the part of manufacturer or anyone else. Nor would accident victims have to prove that the automobiles, or any of the warnings or instructions accompanying the automobiles, are in anyway defective or unreasonably dangerous. Rather, crash victims would need only to prove that the harms for which they seek compensation “arose out of the use of” a vehicle that was designed and built by the manufacturer from whom compensation is sought. Each automaker, therefore, would be financially responsible for the losses resulting from any crash arising out of the use of that automaker’s vehicles.⁷⁰

68. The arguments in this section draw on prior work done by me and a number of other scholars on the deterrence benefits of enterprise liability in various contexts. *See, e.g.*, Hanson & Logue, *supra* note 19; Steve P. Croley & Jon D. Hanson, *Rescuing the Revolution: The Revived Case for Enterprise Liability*, 91 MICH. L. REV. 683 (1993); Kyle D. Logue & Jon D. Hanson, *The Costs of Cigarettes: The Economic Case for Ex Post Incentive-Based Regulation*, 107 YALE L.J. 1163 (1998); and Jon D. Hanson & Douglas A. Kysar, *Taking Behavioralism Seriously: Some Evidence of Market Manipulation*, 112 YALE L.J. 1420, 1553 (1999). In addition, as mentioned in an earlier footnote, the argument here has some overlap with a proposal made by Howard Latin. *See generally* Latin, *supra* note 21 (making a deterrence case of automaker enterprise liability).

69. This could be done through the existing court system or through specialized courts or agencies set up to handle auto-crash disputes.

70. The “arising out of the use of” analysis would replace a causation determination. This phrase is used now in standard auto insurance policies. Thus, an automaker enterprise liability regime would be a particular type of cause-based no-fault compensation regime, modeled after similar programs that have been adopted outside of the auto context, such as workers’ compensation laws at the state level or the vaccine

That is the most basic picture of the proposal. Now consider a few possible details of such a program. One important initial question is who exactly would fall within the class of “automakers” to whom the enterprise liability regime would apply. The most obvious class of defendants/payers would be the original equipment manufacturers (OEMs) of the vehicles involved in the crash. They are the ones who generally make the key automotive design choices, have control over the manufacturing processes, and decide on the terms of any warning or instruction manual; and they are also the ones with the greatest expertise on such questions. Auto manufacturers also determine the pricing of their vehicles and the number of them to produce, subject of course to the constraints of supply and demand. Given that manufacturer care levels and activity levels are key auto-accident deterrence variables, making OEMs responsible for the auto-crash costs associated with their vehicles has obvious deterrence benefits, discussed further below.

Liability under an enterprise liability regime, however, would not necessarily be limited to auto manufacturers. Liability could also be extended, on a joint and several basis (or on a several basis), to a range of other enterprises that fall within the design, production, sale, and distribution chain of any given vehicle.⁷¹ In most cases, it is likely that the crash victim would bring the claim against the manufacturer, and then the manufacturer would either implead the other parties in the chain of production into that suit or would sue them separately in a contribution action. Precisely how the responsibility for the costs of any accident would be allocated among the various parties on the automaker side of the ledger is beyond the scope of this Article. That allocation of responsibility, however, would presumably

compensation program at the federal level. *See generally* Jon D. Hanson, Kyle D. Logue & Michael S. Zamore, *Smokers' Compensation: Toward a Blueprint for Federal Regulation of Cigarette Manufacturers*, 22 S. ILL. L.J. 519 (1998) (discussing deterrence benefits of cause-based no-fault compensation regimes). In the Workers' Compensation context, claims against employers are limited to injuries or illness that “arise out of the course of employment.” Professors Abraham and Rabin have proposed a similar regime—that would also use the “arising out of” standard—but that would apply exclusively to accidents involving Level 5 automated vehicles. Rabin & Abraham, *supra* note 20. My idea is to make such a regime comprehensive, to apply to all motor vehicles, subject to transition rules discussed below. Some scholars have expressed concern about the use of enterprise liability regimes that rely on boundary-maintaining doctrines such as the “arising out of” concept used in workers' compensation regimes, among other places. *See, e.g.*, Henderson, *supra* note 19. This is of course a reasonable concern, although the evidence suggests that programs such as workers' compensation have found relatively effective ways to police the borders of their programs. DON DEWEES, DAVID DUFF & MICHAEL TREBILCOCK, *EXPLORING THE DOMAIN OF ACCIDENT LAW: TAKING THE FACTS SERIOUSLY* 393-394 (1996) (reporting administrative costs for workers' compensation regimes that are low relative to those of the tort system).

71. Thus the concept of “automaker” in an automaker enterprise liability regime could be similar to the concept of a “seller” in existing products liability law.

be determined mostly by contracts among the counter-parties, which contracts should be enforced so long as the cost of auto accidents is not allocated to parties who are insolvent or judgment proof, which if permitted would undermine the deterrence benefits of the regime.⁷²

The types and amount of compensation recoverable under an automaker enterprise liability regime would probably be limited to economic losses—medical expenses, lost income, and property damage. There is of course a deterrence argument for including noneconomic or pain-and-suffering damages as well, since failing to include noneconomic damages could produce a serious externality.⁷³ However, some have argued that individuals do not desire to purchase insurance against non-economic losses (as evidenced by the dearth of pain-and-suffering insurance observed in the marketplace), and therefore should not be forced to purchase such coverage through a mandatory compensation regime.⁷⁴ In any event, limiting compensation to economic losses, and thus not providing compensation for noneconomic harms, is a common and reasonable political compromise that is often made when no-fault cause-based compensation regimes are adopted.⁷⁵

It is worth emphasizing again that the compensation regime I am imagining is a *comprehensive* automaker enterprise liability regime. In other words, it would apply to all automobiles (sold after the effective date of the enacting legislation), whether driven by humans, computer algorithms, or any combination of the two. Thus, unlike some other proposals for manufacturer-funded vehicle compensation regimes, my proposal would *not*

72. See Steven Shavell, *The Judgment Proof Problem*, 6 INT'L REV. OF L. & ECON. 45 (1986) (explaining how presence of insolvent defendants undermines incentive effects of liability law).

73. Noneconomic damages are generally not covered by first-party insurance policies, which means, insofar as drivers (and consumers generally), because of the cognitive biases already discussed, ignore or underestimate the risks of auto accidents, they will externalize noneconomic damages as well. Including noneconomic damages, therefore, has the potential to improve care levels and activity levels. See Hanson & Logue, *supra* note 19, at 186–89 (describing the “unambiguous deterrence benefits of nonpecuniary-loss damages”).

74. Examples of this sort of argument can be found in George L. Priest, *The Current Insurance Crisis and Modern Tort Law*, 96 YALE L.J. 1521, 1546–47; and Alan Schwartz, *Proposals for Products Liability Reform: A Theoretical Synthesis*, 97 YALE L.J. 353, 362–67 (1988). For a powerful set of counter arguments, providing arguments why consumers might—and evidence that they in fact do—demand insurance for noneconomic losses, see Steven P. Croley & Jon D. Hanson, *The Nonpecuniary Costs of Accidents: Pain-and-Suffering Damages in Tort Law*, 108 HARV. L. REV. 1785 (1995).

75. See generally Hanson, Logue & Zamore, *supra* note 66, at 556–62 (reviewing arguments for limiting damages in no-fault cause based compensation regimes to economic damages).

apply exclusively to Level 5 vehicles.⁷⁶ Which is not to say that the regime would not have special rules for autonomous and connected vehicles. For example, whereas Level 5s may be in fewer accidents, or fewer accidents involving serious physical injuries or deaths (that's the hope anyway), Level 5 vehicle accidents may involve much higher auto-repair costs than accidents involving human-driven vehicles, because of the expense of repairing high-tech sensors as well as computer hardware and software.⁷⁷

If an automaker enterprise liability regime were adopted, there would be no need for either the existing automaker liability laws (i.e., products liability as applied to automobiles), driver liability laws, or state auto no-fault laws. All of those auto tort regimes would be replaced by a single comprehensive automaker enterprise liability regime.⁷⁸ Further, if a motor-vehicle crash were to involve two or more vehicles made by different auto manufacturers, the enterprise liability regime would handle the accident as follows: First, the victims would simply file claims for their covered economic losses, naming the automakers of all of the vehicles involved in the accident. After a factual determination was made of whether in fact all of the named vehicles contributed in some way to the accident, the victims' crash costs would be split between or among the automakers (or the auto insurers covering the losses for each automaker). The split among the automakers could either be equal (each vehicle manufacturer bearing its pro rata share of the crash costs) or according to any other reasonable allocation formula that the industry agrees upon.⁷⁹

76. For an interesting proposal to create a special enterprise liability-type regime, similar to the one I am describing, but that would be limited to accidents involving automated vehicles, see Abraham & Rabin, *supra* note 20.

77. Because of the higher repair costs, some in the auto insurance industry have proposed mandatory minimum auto repair coverage for self-driving vehicles. TRAVELERS INSTITUTE, INSURING AUTONOMY: HOW AUTO INSURANCE CAN ADAPT TO CHANGING RISKS 11 (2018), <https://www.travelers.com/iw-documents/travelers-institute/Final-Digital-2018-0710-AV-White-Paper-No-SAE.pdf>. Under enterprise liability, of course, there would indeed be mandatory minimum auto repair coverage, as well as mandatory minimum personal injury coverage, but the coverage mandate would be imposed on automakers instead of auto purchasers.

78. Tort liability for non-economic and potentially punitive damages could be retained for especially egregious behavior, such as recklessness or intentionally harmful actions, on the part of defendants.

79. The deterrence benefit for automaker and driver care and activity levels would largely remain, without the need for individualized fault determinations in multi-vehicle crashes. The crash data gathered from all the payouts under the program would provide information as to which types of vehicles and which drivers tended to be in accidents, how much damage resulted from those accidents, and under what circumstances. This information would be combined with the data gathered by automakers and auto insurers regarding individual vehicle and driver behavior in contexts not involving accidents. There would be little additional deterrence benefit to investing in the costly judicial

One result of the adoption of a comprehensive automaker enterprise liability regime would be an increase in the apparent (and the experienced or internalized) price of most newly purchased automobiles, relative to vehicles purchased before the effective date of the enacting legislation.⁸⁰ This would happen because the cost of auto accidents that had been hidden in non-auto first-party insurance coverage prior to the enterprise liability regime would, with the adoption of the new system, be brought into the open through increases in automobile and auto-insurance prices. Because such a shift would be a significant change in the automotive marketplace, it would probably be prudent (and politically necessary) to institute a delayed effective date and/or an extended phase-in period over which the law would take effect.⁸¹

The Theoretical Deterrence Benefits

Under a comprehensive automaker enterprise liability regime, because automakers would be responsible for all of the economic costs of auto accidents associated with their vehicles, they would be forced to internalize those costs. As a result, there would be beneficial deterrence consequences for automaker, and potentially driver, care and activity levels. This section explores those consequences.

First, automakers would have a strong legal and financial incentive to develop and implement cost-justified auto-safety innovations, whatever those might be. That is, if an automaker determined that there was some new brake design (such as a new computer-assisted automatic braking system) or some new guided cruise control mechanism that would reduce overall accident costs relative to its costs of development and implementation, then enterprise liability would reward them implementing those innovations, and

determination of which driver, if any, was at fault or which vehicle, if any, was defective.

80. This assumes that the new law would have a grandfather provision exempting vehicles built and sold before new law's effective date. As discussed in the conclusion, such complete grandfathering is not the only conceivable approach to handling the transition to the new regime.

81. If there is indeed deterrence value to shifting these costs from non-auto first-party insurers to automakers, as argued in the next section, then the overall price of vehicles (including the costs covered by various forms of first-party non-auto-specific insurance) should eventually go down, especially if the pace of the transition to driverless technology is hastened. Indeed, a significant result of adopting a comprehensive automaker enterprise liability regime is that Level 5 vehicles, if they provide as big an advance in safety as many are expecting, would be substantially less expensive overall than conventional human-driven vehicles. Cf. Bryant Walker Smith, *Automated Driving and Product Liability*, 2017 MICH. ST. L. REV. 1 (2017) (discussing the potentially massive reduction in overall vehicle prices resulting from the shift to automated vehicles under existing product liability law). A bigger concern with the price increase is the effect on low-income drivers. I address this concern briefly in Part IV below, though the cost of mobility generally is a topic worthy of special consideration.

punish them for not doing so. What's more, there would be no inefficient incentive to stick with existing industry customs or consumer expectations if such customs or expectations were lagging behind proven safety innovations. Likewise, there would be no incentive to *over*-invest in safety features that are likely to impress a court or jury in a negligence-based lawsuit (such as a design defect lawsuit) but that, in actuality, provide less additional accident-risk reduction than they cost to produce.⁸²

Second, enterprise liability would force the price of automobiles to reflect the full-expected costs of auto accidents. That cost-internalization, in turn, could result in a scale of automotive manufacturing and sales that would be closer to the social optimum than is currently the case, as drivers would—in deciding whether to purchase a vehicle—be more likely to take into account something closer to the full social costs of that decision. In other words, auto enterprise liability could push us in the direction of optimal manufacturer activity levels: the optimal number of vehicles being sold. If that were to happen, it would be a clear improvement—in terms of overall efficiency—over the existing negligence-based automaker liability regime.

It is worth pausing here to emphasize the potential effects of a comprehensive automaker enterprise liability regime on the development of and transition to Level 5 vehicles. Because it would be a comprehensive regime, it would apply to both driverless and human-driven vehicles. Assuming automakers expect Level 5s to bring a dramatic reduction in expected accident costs relative to human-driven vehicles, then Level 5s, when they eventually are available for sale to consumers, would have a substantially lower enterprise liability “tax” relative to human-driven vehicles made and produced after the new regime is adopted, since the human-drive vehicles would have much higher expected accident costs.⁸³ As

82. Obviously, automakers already have some incentives to develop such safety technology, in part because of consumer tastes for safer vehicles and perhaps because of the threat of potential liability under existing tort law. *See, e.g.*, Press Release, NHTSA, NHTSA-IIHS Announcement on AEB, (Dec. 21, 2017), <https://www.nhtsa.gov/press-releases/nhtsa-iihs-announcement-aeb> (“Twenty automakers pledged to voluntarily equip virtually all new passenger vehicles by September 1, 2022, with a low-speed AEB system that includes forward collision warning technology proven to help prevent and mitigate front-to-rear crashes.”). Consistent with this fact, it is common knowledge that safety innovation has been happening for decades without the presence of an automaker enterprise liability regime. My argument is that, according to a nuanced application of standard deterrence theory, safety-enhancing automotive innovations would be more likely to be adopted and would be adopted more quickly under an automaker enterprise liability regime. *See, e.g.*, Latin, *supra* note 21, at 691 (making similar argument with respect to airbags, suggesting that adoption of automaker enterprise liability would have hastened the industry’s move to include airbags).

83. For now, I am assuming that “old” vehicles, produced before the enactment of the new regime, would be totally grandfathered and thus exempt from the new law. I

a result, there would be a natural enterprise liability subsidy in favor of the production of Level 5 vehicles; and this subsidy, in effect, would be funded by a relatively high enterprise liability tax on human-driven vehicles, again, assuming such vehicles are not nearly as safe as Level 5s. Thus, the adoption of a comprehensive automaker liability regime would, under present assumptions, strongly incentivize and reward auto manufacturers to proceed, as quickly as is feasible, with the development and distribution of Level 5 vehicles. By contrast, if a special liability regime were adopted just for Level 5s, that increased their potential accident liability relative to human-driven vehicles, there would be a disincentive to move to Level 5s in the absence of a separate subsidy regime, perhaps funded by federal income taxes.⁸⁴

There are efficiency reasons to prefer a Level 5 vehicle subsidy that is funded through an enterprise liability tax on auto sales, with the amount of the cross-subsidy depending on the relative risk of vehicles (and drivers), over a subsidy funded by federal income taxes. The main advantage has to do with information. Under the direct subsidy, the regulator—or whatever government body would be asked to determine the amount and structure of the subsidy—would have to determine which particular safety technologies to subsidize and which not to subsidize and how much the subsidy should be. This would require an enormous amount of information and expertise that is not within the government's comparative advantage relative to the auto industry. By contrast, under the subsidy structure inherent in a comprehensive enterprise liability regime, it is the auto industry who would calculate the appropriate amount of the subsidy *ex ante*, based on their educated guesses about (a) the amount of costs to be imposed on them under the regime for accidents involving human-driven vehicles, (b) the amount of costs that would be imposed on them if they make the investment necessary to develop and implement Level 5 vehicles, and (c) the R&D, design, manufacturing, marketing, training, and other costs that would be necessary to get Level 5s fully up and running.⁸⁵

If an enterprise liability regime is likely to have deterrence benefits on the

return to this assumption in the conclusion.

84. Abraham and Rabin make such a proposal, including the need for a subsidy for Level 5 vehicles. Abraham & Rabin, *supra* note 20, at 45.

85. It is at least possible that the expected accident costs associated with Level 5 vehicles will not be, overall, a lot less than that of human-driven vehicles, once the cost of repairing the vehicles is taken into account. That is, while Level 5s are expected to reduce frequency collisions and the number of auto-related deaths and serious bodily injuries, they may result in increased repair costs, due to the expense of repairing or replacing the damaged technology in a Level 5 vehicle. In that sense, we might be trading one sort of cost for another, which of course can be socially desirable. This fact, however, might counsel in favor of including at least some noneconomic (or pain-and-suffering) damages in the enterprise liability regime, to make sure that such costs get included in the enterprise liability subsidy for Level 5 vehicles.

automaker side, what about its deterrence effects on driver behavior? How an auto-enterprise liability regime would affect the driving behavior of human drivers is of course an especially important question, given that, with non-Level 5 vehicles, human drivers make most of the important operational decisions. In fact, enterprise liability could actually help with driver care and activity levels in a number of ways. First, enterprise liability would create strong legal and financial incentives for automakers to develop and adopt the most cost-effective ways of warning drivers about crash risks and of instructing drivers about how best to avoid certain types of accidents.⁸⁶ This effect flows from the fact that enterprise liability makes automakers' responsible for all the economic costs of their vehicles' accidents: If an automaker could actually reduce the frequency or severity of accidents in its vehicles by altering the wording, design, or placement of warnings or instructions, it would have an incentive to do so. On the other hand, if some new or revised warning would be more likely to confuse or annoy drivers than to educate them, the automaker would be incentivized under enterprise liability not to add that sort of unhelpful warning—even if it would have gotten the automaker “off the hook” under a more traditional negligence-based warning-defect standard. Automakers would do whatever works best to reduce accident costs, which would redound to their benefit as reduced auto-accident claim payouts over time.

In addition, enterprise liability could incentivize automakers to restructure the ways that automobiles are insured and sold in order to improve driver care and activity levels. First, consider how an enterprise liability regime might affect how auto insurance is provided. Note that under an enterprise liability regime automakers would have an incentive to shift contractually much of the expected costs of auto accidents to auto insurers. This somewhat counterintuitive result flows from the fact that auto insurers' have a comparative advantage with respect to monitoring and regulating driver care- and activity-levels. If automakers could get auto insurers to take on somewhat more of the risk of auto accidents, the insurers would have a strong incentive to help drivers reduce expected accident costs. That is, because of competition for customers in the insurance industry, auto insurers would be incentivized to use the tools at their disposal—including individualized, driving-behaviorally-sensitive, risk-adjusted insurance premiums—in ways that would tend to encourage better driving habits and perhaps less driving, especially by high risk drivers.⁸⁷

86. It is a standard conclusion of deterrence theory that enterprise liability would provide strong incentives for manufacturers to develop effective warnings. Croley & Hanson, *supra* note 68, at 786–792.

87. Ben-Shahar & Logue, *supra* note 51, at 220–223.

What does this mean for how auto insurance would be sold? Auto insurance under an enterprise liability regime might be sold in the same way that it is today. An individual auto purchaser, in other words, might pay the automaker one price for the vehicle itself and then purchase a separate auto insurance policy at the same time from a separate auto insurance company. However, given that automakers would be ultimately responsible legally (through the doctrine of subrogation) for the auto-accident losses paid by the auto insurers, there would be strong incentives for contractual coordination between automakers and auto insurers. Individual auto manufacturers might even be induced to partner with particular auto insurers in an effort to offer the best, most competitively priced, combined product of vehicle and vehicle-insurance coverage.⁸⁸

Another way that enterprise liability could improve driver care and activity levels is through its effect on how automobiles are sold. For example, the introduction of an enterprise liability regime might push the automotive industry in the direction of lease transactions rather than outright sales. This is because leasing would make it easier for automakers to enforce the terms of the auto insurance policies, which again might be sold by an insurer who was contractually partnered with the automaker. Under a lease arrangement, for example, if a driver became uninsurable (because of bad driving behavior and/or increased claim payouts), or if the driver simply stopped paying her premiums, there might be a provision in the lease empowering the automaker to reclaim the vehicle.

In addition to favoring leasehold arrangements, the introduction of enterprise liability might create market pressure on auto manufacturers to sell vehicles to commercial purchasers rather than individual consumers. That is, automakers under enterprise liability might be incentivized to sell to commercial entities—fleet operators—who would agree contractually to indemnify the manufacturer for any enterprise liability payments made to victims harmed by vehicles in their fleets. These commercial purchasers, in turn, would either lease the vehicles to individual drivers or perhaps make them available through ride-share arrangements. Automakers in turn could be incentivized to choose commercial purchasers who are financially

88. Why are automakers and auto insurers not incentivized now, without the adoption of enterprise liability, to coordinate in the way described in the text? This is a fair question, one that I have put to representatives of both industries and to which I have yet to get a good answer. I suspect that under current legal rules and market conditions, those incentives are dampened. Automakers can largely avoid liability by complying with the largely negligence-based product liability rules, and auto insurers make profits from insuring the residual accident risk. Neither industry—car makers or car insurers—are being forced to bear the full losses of auto accidents. In addition, because much of the risk of auto accidents are externalized by drivers to their non-auto first-party insurers, as discussed above, there is little demand-side incentive for either industry to coordinate with the other.

responsible and would be incentivized to purchase efficient auto insurance contracts to cover the enterprise liability payouts. Such a trend toward commercial fleets would be consistent with already existing market trends towards ride-sharing companies, which trends are expected to accelerate with the advent of Level 5 vehicles.⁸⁹

I am not suggesting that comprehensive automaker enterprise liability would necessarily result in auto lease arrangements replacing individual sales, or ride sharing replacing driving. Rather, the point is that, once automakers are made legally responsible for the cost of auto accidents (or for most of those costs), they will have an incentive (and the ability) to structure automobile distribution markets in ways that are closer the social optimal.

IV. CAVEATS, CONCERNS, AND CONCLUSIONS

The description I have given here of an automaker enterprise liability regime is necessarily only a rough outline of an idea, a jumping off point for further discussion. The actual design of such a program would require empirical research into a range of topics, including whether shifting to enterprise liability would actually, and not just theoretically, produce substantial deterrence benefits. Among the other questions that would need to be answered include the following:

Under any real-world version of an automaker enterprise liability regime, there is the question of how long the automakers' responsibility for insuring their vehicles would remain in effect. Would it be for the useful life of the vehicle or for some set period of time, say, ten years? If for some set period of time, who then would be responsible for covering the accidents arising out of the use of the vehicle? Also, what would the precise relationship be between an automaker enterprise liability regime and state mandatory insurance/financial responsibility laws? Presumably, rescission of coverage by the insurer due to excessive accident experience or failure to pay premiums would result in a suspension of driving privileges, but how would that be enforced? All good questions.

Similarly, if an auto enterprise liability regime were adopted, would it in fact have a grandfather provision perhaps exempting all vehicles manufactured and sold before a given date, as suggested above? Or would older vehicles made before the new law goes into effect be transitioned into the new regime over time? If older vehicles were fully exempted from (or grandfathered out of) the new regime, how would we deal with the resulting,

89. Andrew G. Simpson, *If They Try It, They'll Like It: How Ridesharing, Autonomous Cars Will Win Over the Public*, INSURANCE JOURNAL (Jan. 23, 2018), <https://www.insurancejournal.com/news/national/2018/01/23/478073.htm>.

potentially large, price differential between new vehicles (which would be priced with full accident costs internalized into the purchase price) and used vehicles (which would not be)? What role could increased mandatory minimum levels of auto insurance play in assisting with that transition?⁹⁰

There is also a whole range of question regarding how an automaker enterprise liability regime would deal with the threat of auto crashes (or stolen or destroyed data) resulting from criminal hacking of a connected system. Existing and growing markets in cyber insurance coverage might be able to handle the risks of posed to data stored in the vehicles, but the market may have more difficulty covering cyber risks to life, limb, and property.⁹¹ Solutions range from expanding the role of the federal government as a reinsurer of last resort to limiting liability for cyber-related physical risks to the amount of mandatory liability insurance coverage. All of these details, and many others, would need to be addressed before any comprehensive automaker enterprise liability regime could seriously be considered.

The final concern raised by the idea of an automaker enterprise liability regime involves the cost. The concern is not that the “experienced” price of autos would rise, although that would certainly be true in the short run. As already noted,⁹² such a price increase would be the source of much of the deterrence benefit of an enterprise liability regime, the mechanism through which deterrence would work, incentives for accident-avoidance optimized. Rather, the concern has to do with the problem of affordability. For some households, owning an automobile is already unaffordable, which is a source of hardship and an obstacle to social mobility. For those households, a program that raised the price of autos, even in an effort to make them safer, may not be a welcome change without some form of compensating subsidy. My own view is that some type of taxpayer funded transportation subsidies

90. An alternative to a comprehensive automaker enterprise liability regime would be simply to increase auto insurance mandates to provide coverage closer to what would be provided under an enterprise liability regime. Such a regime could be made comprehensive, in the sense that it would apply both to human-driven and computer-driven vehicles, with perhaps higher repair cost minimum coverage for Level 5 vehicles. A comprehensive mandatory auto insurance regime could also replace all of existing automaker liability and driver liability law in much the same way as I propose for auto enterprise liability and would also likely result in contractual coordination between the automakers and the auto insurers to provide the best combination of auto safety and auto-crash risk coverage. A full discussion of this auto-insurance-mandate alternative to automaker enterprise liability is of course beyond the scope of this Article.

91. Most cyber policies include exclusions for physical damages to persons or property. John Buchanan, Dustin Cho, and Patrick Rawsthorne, *When Things Get Hacked: Coverage for Cyber Physical Risks*, 2018 A.B.A. LITIG. SEC., INS. COVERAGE LITIG. COMM. HOT TOPICS FOR ICLC’S 40TH—THE COVERAGE BATTLES OF 2028 TUCSON, ARIZONA—MARCH 3, 2018, 2.

92. See *supra* discussion at note 81.

for the low-income drivers may indeed be desirable (from a social justice perspective), whether or not an automaker enterprise liability regime were adopted. But that topic too must await another day.