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WADING THROUGH THE MUDDLE OF RISK-UTILITY ANALYSIS

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INTRODUCTION

The major developments in products liability law over the past three decades include the adoption of strict liability, the develop-

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ment of the concept of a design defect, and the inclusion of inadequate warnings as a form of defective product design.¹ These developments, however, are not unrelated because the major test for defective designs is a strict liability concept.² Generally, the test employed to determine liability for product defects is the risk-utility test developed by Dean Wade.³

The temporal pattern of litigation and insurance premium statistics highlight this test's central role with respect to the expanding role of liability.⁴ In fact, the consequences for producers due to this design defect doctrine are enormous.⁵ If, for example, producers were only held liable for random manufacturing defects, then, generally, only those randomly determined errors will generate liability claims. With a design defect test, however, the cost of all risks associated with an entire product line can potentially be charged to the producer. This occurs if one can demonstrate, through a risk-utility analysis, that the product was too risky to be marketed or should have been designed differently.⁶ Such a test would balance the risks associated with the product design against the utility of that particular design.⁷ In the case of a product design change, for example, one must inquire whether the costs associated with an improved and safer design are warranted given the level of risk reduction that would be achieved.⁸

Risk-utility analysis plays an instrumental role in three different

1. See R. EPSTEIN, *MODERN PRODUCTS LIABILITY LAW* 25-36 (1943) (discussing progression from doctrine of privity to concepts of strict liability and design defect in area of products liability).

2. See Birnbaum & Wrubel, "State of the Art" and Strict Products Liability, 21 *TORT & INS. L.J.* 30, 30 (1985) (stating that strict liability in tort has become prevailing law in most jurisdictions for harms caused by defective products).

3. See Wade, *On the Nature of Strict Tort Liability for Products*, 44 *MISS. L.J.* 825, 837-88 (1973) (enumerating seven factors to be weighed in determining whether product is unreasonably dangerous); J. O'REILLY, *PRODUCT DEFECTS AND HAZARDS: LITIGATION AND REGULATORY STRATEGIES* § 411 (1987) (providing background material on risk-utility analysis).

4. See generally K. ABRAHAM, *DISTRIBUTING RISK: INSURANCE, LEGAL THEORY, AND PUBLIC POLICY* 44-100 (1986) (providing background discussion of interrelationship between pricing of insurance and insurance risk classification).

5. See *infra* notes 118-73 and accompanying text (discussing relationship between design defect doctrine and producer).

6. See *infra* notes 111-73 and accompanying text (articulating contexts in which risk-utility test could apply).

7. See *infra* notes 118-53 and accompanying text (discussing applicability of risk-utility analysis to changes in product design); Larsen, *Strict Products Liability and the Risk-Utility Test for Design Defect: An Economic Analysis*, 84 *COLUM. L. REV.* 2045, 2046 (1984) (stating that risk-utility test asks whether "on balance the benefits of the challenged design outweigh the risk of danger inherent in such design").

8. See *infra* notes 118-53 and accompanying text (demonstrating theory of risk-utility test as it applies to product changes).

liability contexts.⁹ First, courts have applied this analysis to changes in a product's physical design by ascertaining, for example, whether a particular safety mechanism is warranted.¹⁰ Second, the risk-utility test provides the basis for determining the need for hazard warnings.¹¹ Such warnings alter the risk by providing information to consumers rather than by changing the product's physical attributes. The third and most controversial area in which the courts have extended risk-utility analysis is with respect to whether the product should be marketed at all.¹² This recent application of risk-utility analysis marks a substantial expansion in the scope of risk-utility analysis.¹³

Unfortunately, the increased use of the risk-utility approach has not been accompanied by a sound articulation of the procedures that courts should follow when undertaking the analysis.¹⁴ Other than a list of seven factors articulated by Dean Wade in his seminal article, there is little available guidance as to what a risk-utility test means.¹⁵ Even those seven factors, however, do not constitute a completely developed approach to assessing design defects.¹⁶ Con-

9. See *infra* notes 10-12 and accompanying text (describing three areas where risk-utility test is applicable).

10. See *Hull v. Eaton Corp.*, 825 F.2d 448, 453 (D.C. Cir. 1987) (noting that in order to show forklift manufacturer acted unreasonably, plaintiff had to establish relative risks and costs of alternative designs); *Brady v. Melody Homes Mfr.*, 121 Ariz. 253, 259, 589 P.2d 896, 900 (1979) (ruling on alleged defective design of mobile homes); *Byrns v. Riddell, Inc.*, 113 Ariz. 264, 267, 550 P.2d 1065, 1068 (1976) (applying risk-utility analysis to suit brought by injured football player against helmet manufacturer).

11. See *Watson v. Uniden Corp.*, 775 F.2d 1514, 1515 (11th Cir. 1985) (affirming summary judgment ruling for manufacturers based on adequate warnings); *Fraust v. Swift & Co.*, 610 F. Supp. 711, 713 (W.D. Pa. 1985) (noting that liability cannot be imposed on seller if user knew or should have known danger associated with product); see also O'Reilly, *supra* note 3, at 133 (discussing risk-utility standard and hazard warning cases); Schwartz, *Proposals for Products Liability Reform: A Theoretical Synthesis*, 97 YALE L.J. 353, 396-98 (1988) (describing functions of warnings as they relate to determination of risk level).

12. See *O'Brien v. Muskin Corp.*, 94 N.J. 169, 185, 463 A.2d 298, 306 (1983) (suggesting that risk of product may outweigh its utility, even when no evidence for alternative design is presented); *Cepeda v. Cumberland Eng'g Co.*, 76 N.J. 152, 163, 386 A.2d 816, 821 (1978) (concluding that risk-utility analysis can be applied to manufacturer's initial decision of whether to market product at all).

13. See *Larsen, supra* note 7, at 2061-67 (criticizing *O'Brien's* extension of risk-utility analysis to injuries involving products with no technologically feasible alternative design). Until *O'Brien*, a plaintiff had to show evidence of a defective design in order to recover for an injury in a product liability suit. *Id.* at 2049.

14. See *id.* at 2051 (noting that although Wade's factors provide components to consider in risk-utility analysis, these components are difficult to apply because he does not discuss relative weight and application of factors).

15. See *supra* note 3 (discussing Wade's article); *infra* notes 23-32 (reviewing Wade's seven factors and discussing their relevance).

16. See *Sheehan v. Anthony Pools*, 50 Md. App. 614, 621 n.6, 440 A.2d 1085, 1089 n.6 (1982) (observing that Wade's factors merely "rationalize what most courts do in deciding design cases, although not all the factors are necessarily weighed nor is the risk-utility analysis denominated as such"), *aff'd*, 295 Md. 285, 445 A.2d 434 (1983); see also *Larsen, supra* note 7, at 2050-51 (referring to failure of factors to provide adequate framework for analysis).

sequently, some critics have called for the abandonment of the risk-utility approach, viewing the test more as a metaphor than as a precise legal doctrine that the courts can implement.¹⁷ Indeed, the application of a risk-utility analysis may itself be wrought with many of the same problems of vagueness and unpredictability that this test was intended to reduce.¹⁸ Moreover, some legal scholars also question the appropriateness of risk-utility analysis and its use in considering whether a product is too risky to be marketed at all.¹⁹ This controversy has arisen perhaps in part because of the absence of a well-developed risk-utility theory, which has left the ultimate scope and application of the analysis indeterminate.

These controversies represent a fundamental challenge to the role of risk-utility analysis and the design defect doctrine. Although there have been occasional elaborations on Wade's seven factors,²⁰

17. See Schwartz, *supra* note 11, at 386-88 (referring to "risk/benefit" test as being too difficult to apply because benefit is "impossible for either firms or juries to ascertain").

18. Owen, *Rethinking the Policies of Strict Products Liability*, 33 VAND. L. REV. 681, 696 (1980).

19. See Larsen, *supra* note 7, at 2061 (discussing application of risk-utility analysis to decision to remove product from market).

20. See Montgomery & Owen, *Reflections on the Theory and Administration of Strict Tort Liability for Defective Products*, 27 S.C.L. REV. 803, 818 (1976) (proposing variation on Wade's factors). The authors propose the following four factors as a replacement for Wade's seven:

- (1) The cost of injuries attributable to the condition of the product about which the plaintiff complains — the pertinent accident costs.
- (2) The incremental cost of marketing the product without the offending condition — the manufacturer's safety cost.
- (3) The loss of functional and psychological utility occasioned by the elimination of the offending condition — the public's safety cost.
- (4) The respective abilities of the manufacturer and the consumer to (a) recognize the risks of the condition, (b) reduce such risks, and (c) absorb or insure against such risks — the allocation of risk awareness and control between the manufacturer and the consumer.

Id. According to another author, the model should consist of the following 13 factors:

1. The nature of the product as a vehicle for recreation of persuasive advertising images, and the relationship of this factor to the ability of sellers to generate product representations in mass media;
2. The specificity of representations and other communications related to the product;
3. The intelligence and knowledge of consumers generally and of the disappointed consumer in particular;
4. The use of sales appeals based on specific consumer characteristics;
5. The consumer's actions during his encounter with the product, evaluated in the context of his general knowledge and intelligence and of his actual knowledge about the product or that which reasonably could be ascribed to him;
6. The implications of the proposed decision for public health and safety generally, and especially for social programs that provide coverage for accidental injury and personal disability;
7. The incentives that the proposed decision would provide to make the product safer;
8. The cost to the producer and other sellers of acquiring the relevant information about the crucial product characteristic and the cost of supplying it to persons in the position of the disappointed party;
9. The availability of the relevant information about the crucial product characteris-

minor elaborations on his theory do little to address the fundamental challenges lodged against the approach. Rather than tinkering with this list of vaguely specified concerns, this potentially workable and coherent doctrine requires a complete overhaul.

The focus of this Article is twofold. First, it will provide a critical assessment of the risk-utility theory. Although the general idea of a balancing test is worthwhile, the risk-utility approach currently includes a confused mix of pertinent concerns.²¹ Second, this Article will develop a systematic and coherent economic approach to assessing design defects. Such formulation of the product defect test will enable one to achieve the balancing originally envisioned by Dean Wade. The approach presented in this Article, in effect, represents an economic formulation of the essential approach embodied in Wade's risk-utility analysis. That is, the most pertinent defect test is essentially a negligence test based on what the producer should have known at the time when the product was produced.

In Part I, this Article provides a review of Wade's seven factors. Although Wade's widely cited analysis highlights the relevant concerns as well as the general approach that should be used, it does not provide a "test" in any meaningful sense. Part II develops alternative risk-utility measures that could be applied in different contexts. This section also offers a formal description of the components of the risk-utility analysis and an indication of which components are relevant to different circumstances.

Part III recognizes that the risk-utility test should not be viewed as a single test but rather as a sequence of tests that might be applied. Accordingly, different tests from the sequence would be employed depending on the different classes of issues. For example, in the case of design defects involving product modifications, the risk-utility test to be applied would be quite different from what one would apply to the threshold decision of whether a product should be mar-

tic to persons in the position of the disappointed party and the cost to them of acquiring it;

10. The effects of the proposed decision on the availability of data that bear on consumer choice of goods and services;
11. Generally, the likely effects on prices and quantities of goods sold;
12. The costs and benefits attendant to determination of the legal issues involved, either by private litigation or by collective social judgment;
13. The effects of the proposed decision on wealth distribution, both between sellers and consumers and among sellers.

Shapo, *A Representational Theory of Consumer Protection: Doctrine, Function and Legal Liability for Product Disappointment*, 60 VA. L. REV. 1109, 1370-71 (1974); see Fischer, *Products Liability — The Meaning of Defect*, 39 Mo. L. Rev. 339, 359 (1974) (developing multifactor model analyzing risk spreading from points of view of consumer, manufacturer, and safety incentives).

21. See *infra* notes 90-114 and accompanying text (discussing concerns of risk-utility approach).

keted at all. Because different economic factors enter in each case, Part III discusses the applicability of these tests to the consideration of alternative product designs, the assessment of hazard warnings, and the threshold decision regarding the marketability of a product. Part IV discusses the informational requirements involved in a risk-utility judgment and considers which institutions would be most appropriate for handling these assessments.

Finally, this Article concludes that the overall approach embodied in risk-utility analysis is a potentially sound economic and legal doctrine. Nevertheless, the risk-utility test as it is currently applied does not provide a systematic or coherent framework for assessing liability. A proper formulation of the test, which this Article sets forth, establishes an evaluative approach that is applicable in a wide variety of products liability settings.

I. WADE'S SEVEN FACTORS FOR ASSESSING PRODUCT DEFECTS

Since the publication of Dean Wade's article, the risk-utility test has played a central role in determining whether a producer should be held strictly liable for accidents arising from its products.²² Wade's seven factors have played not only a dominant role in the liability literature, but have also been adopted, with minor modifications, in court decisions.²³ Although his seven factors do not constitute a meaningful economic test, they do highlight the general theme of the risk-utility approach. This approach recognizes the important trade-offs that are involved in designing and producing products.²⁴ Achieving improvements in safety requires additional expenditures of funds, and one must strike an appropriate balance between these additional expenditures and the safety gains they will produce. The interests of consumers, manufacturers, and the gen-

22. See Larsen, *supra* note 7, at 2046 (stating that in recent years, risk-utility test has replaced consumer expectations test in defective design cases).

23. See, e.g., *Hull v. Eaton Corp.*, 825 F.2d 448, 453 (D.C. Cir. 1987) (noting that in order to determine whether manufacturer acted unreasonably in design of forklift, court must weigh "risks inherent in design employed and alternative designs, relative costs of both designs, and the considerations that are taken into account in the design of forklifts"); *Gomulka v. Yarapai Mach. & Auto Parts, Inc.*, 155 Ariz. 239, 242, 745 P.2d 986, 990 (1987) (considering factors such as product's usefulness and desirability, availability of safe alternatives, and manufacturer's ability to eliminate danger in applying risk-benefit analysis to products liability claim involving injured mechanic); *Cepeda v. Cumberland Eng'g Co.*, 76 N.J. 152, 163, 386 A.2d 816, 821 (1978) (applying risk-utility analysis to determination of whether reasonably prudent manufacturer would have marketed product after considering hazards and utility of machine, ease of incorporating safeguards, and likelihood that users would operate machine in safest manner); *Cremeans v. International Harvester Co.*, 6 Ohio St. 3d 232, 235, 452 N.E.2d 1281, 1284 (1983) (stating that risk-utility analysis does not involve exclusive list of relevant factors, but incorporates varying factors given particular facts of case at hand).

24. See Larsen, *supra* note 7, at 2050 (stating that risk-utility analysis serves as means of balancing competing considerations of safer products and utility generated by products).

eral public must be considered.²⁵

This doctrine has obvious advantages over other approaches, including the consumer expectations model because that model does not employ such a balancing test.²⁶ The consumer expectations test focuses on whether a product is as safe as consumers expect.²⁷ Nevertheless, the product should not necessarily be declared "defective" even if it does not meet the consumer's expectations. That is, because the costs of alternative designs might be substantial, consumers may continue to purchase the goods, even if they are aware of the defect.²⁸ Thus, the costs of eliminating the defect are clearly relevant, and the risk-utility test captures these competing concerns.²⁹

In the context of the courts, this test is referred to as a risk-utility test, a danger-utility test, or a risk-benefit test.³⁰ Such a definitional determination depends upon the fundamental role that possible trade-offs entail. When the federal government makes policy, it also applies a similar procedure known as a cost-benefit analysis.³¹ The nature of this test is not identical to risk-utility analysis. Under a cost-benefit analysis, one assesses all of the benefits and costs to society. A product passes this test if overall societal benefits exceed costs. The risk-utility analysis involves a less formal tallying of a

25. See *O'Brien v. Muskin Corp.*, 94 N.J. 169, 183, 463 A.2d 298, 305 (1983) (noting that risk-utility analysis provides flexibility necessary to accommodate concerns of manufacturers, consumers, and public).

26. M. SHAPO, *THE LAW OF PRODUCTS LIABILITY* § 8 (1987); see Schwartz, *supra* note 11, at 384-85 (asserting that consumer expectations test merely focuses on whether product is as safe as consumer would reasonably expect it to be). Consumers may, for example, expect that a car driven into a lake will float. When cars do not perform in this way, they will fail to meet consumers' expectations. The product, however, would not necessarily be considered defective because these expectations are unreasonable. Ultimately, one must address the overall merits of a design change, which is the object of the risk-utility test.

27. See Schwartz, *supra* note 11, at 384-85 (describing consumer expectations test); see also Birnbaum, *Unmasking the Test for Design Defect: From Negligence [to Warranty] to Strict Liability to Negligence*, 33 VAND. L. REV. 593, 611-18 (1980) (highlighting difficulty in determining objectively what ordinary consumer would reasonably expect).

28. See *infra* notes 138-39 and accompanying text (discussing dampening effect that warning labels on products have on consumers' demand for those products).

29. See Wade, *On Product "Design Defects" and Their Actionability*, 33 VAND. L. REV. 551, 572-73 (1980) (stating that jury instruction regarding whether particular claim is actionable should emphasize that alternative design "must be feasible from standpoints of technology, cost and usability").

30. See, e.g., Schwartz, *supra* note 11, at 386 (referring to "risk/benefit" test); Larsen, *supra* note 13, at 2045 (referring to "risk/utility" test); Keeton, *The Meaning of Defect in Products Liability Law — A Review of Basic Principles*, 45 MO. L. REV. 579, 592 (1980) (referring to "danger versus utility" test).

31. See E. STOKEY & R. ZECKHAUSER, *A PRIMER FOR POLICY ANALYSIS* 134-58 (1978) (describing cost-benefit analysis as it applies to public expenditures); see also EXECUTIVE OFFICE OF THE PRESIDENT, OFFICE OF MANAGEMENT AND BUDGET REGULATORY PROGRAM OF THE U.S. GOV'T, April 1, 1988-March 31, 1989, at 33-35 (1988) (explaining role of benefit-cost analysis in federal regulatory policy).

product's effects and, more importantly, is concerned primarily with the benefits and costs for the product purchasers and the firm, and not the effects on society at large. Benefits that reduce the trade deficit, for example, might enter a cost-benefit test but not a risk-utility test. The essential emphasis of focusing on trade-offs remains the same. In sum, risk reduction is not costless and, because society's resources are limited, ultimately some trade-offs must be made.

A. *Wade's Analysis*

Wade proposes the following seven factors as significant in establishing a liability test:

- (1) The usefulness and desirability of the product — its utility to the user and to the public as a whole.
- (2) The safety aspects of the product — the likelihood that it will cause injury, and the probable seriousness of the injury.
- (3) The availability of a substitute product which would meet the same need and not be as unsafe.
- (4) The manufacturer's ability to eliminate the unsafe character of the product without impairing its usefulness or making it too expensive to maintain its utility.
- (5) The user's ability to avoid danger by the exercise of care in the use of the product.
- (6) The user's anticipated awareness of the dangers inherent in the product and their avoidability, because of the general public knowledge of the obvious condition of the product, or of the existence of suitable warnings or instructions.
- (7) The feasibility, on the part of the manufacturer, of spreading the loss by setting the price of the product or carrying liability insurance.³²

B. *Reorganization of the Factors*

Although Wade should receive credit for conceptualizing the importance of making safety trade-offs and raising many relevant factors, the risk-utility test is not fully operational. Despite the merits of his factors, Wade does not propose any definitive test. A list of concerns is not tantamount to a liability test.

Wade's list of factors leaves us with many unanswered questions. For instance, how is the performance of a product with respect to the seven factors to be measured and, once measured, how are these values to be aggregated to assess whether the product passes the

32. Wade, *supra* note 3, at 837.

test? There are no formal procedures of this type. In almost all cases, competing effects involving the various factors will be involved. Under what circumstances are opposing effects offsetting? Do all factors receive equal weight? On how many dimensions must a product fail before it is found to be defective? The risk-utility test, as it is currently articulated, cannot generally form the basis for determining whether a producer should be liable for a product-related injury.

The difficulties created by viewing the seven factors as a formal test are highlighted by the disparity of the concerns that it incorporates. The factors comprise neither a checklist of pertinent considerations nor a series of tests that should be undertaken. Rather, they reflect a hybrid of both of these quite disparate sets of influences, with two factors—factors four and six—cutting across both sets of concerns.

As summarized in Table 1, the attributes used to determine whether a product passes a risk-utility test include: the product's usefulness (factor one), its safety (factor two), the costs of product change (factor four), consumer awareness of the dangers (factor six), and risk spreading (factor seven). When assessing these dimensions, one can judge the desirability of the current product relative to the following alternatives: a product ban (factor three), alteration of the product's characteristics (factor four), reliance on the consumer to take precautions rather than altering the product (factor five), and alteration of the product through warnings (factor six).

Even if Wade had fully articulated the factors, it would still be illogical to combine all of the sets of influences into a single test. Some of the factors pertain to attributes for evaluation, whereas others pertain to tests that should be applied. One uses the attributes in the context of these different tests, as they do not represent a set of factors with a similar function. The four tests identified in Table 1 represent three different ways in which a product could be found to be defective (factors three, four, and six). Additionally, they consider the cheapest cost-avoider issue (factor five) that conditions many of the judgments regarding the relative allocation of responsibility between the consumer and producer.

C. Assessment of the First Six Factors

The first factor pertains to the utility of the product. In interpreting the concept of utility, however, one must not impose one's own notion of value on the product purchaser. The possibility of this

TABLE I
CATEGORIZATION OF WADE'S SEVEN FACTORS

	SUMMARY FACTOR DESCRIPTION	ATTRIBUTES FOR EVALUATION	TESTS FOR EVALUATION
1.	Usefulness and desirability	Consumer benefit	—
2.	Safety	Risks to consumer	—
3.	Substitute products	—	Product ban desirability
4.	Feasibility to alter	Costs of product changes	Product modification desirability
5.	User's ability to exercise care	—	Cheapest cost avoider
6.	Risk awareness, warnings	Unexpected injury costs	Warnings desirability
7.	Risk spreading	Insurance	—

danger was evidenced in *O'Brien v. Muskin*.³³ In *O'Brien*, the court stated that "the evaluation of the utility of a product . . . involves the relative need for that product; some products are essentials, while others are luxuries."³⁴ This statement highlights the fallacy that "essentials" provide utility whereas "luxuries" do not. From an economic standpoint, an arbitrary judgment such as this is inappropriate because the usefulness and desirability of a product will be reflected in the price that consumers are willing to pay.³⁵

In a democratic society, courts should not be engaged in a process of deciding that some products are not useful or essential. Instead, the price that consumers are willing to pay for a product is the most appropriate measure of desirability, for it is the consumer's well-being that a risk-utility test is intended to protect. This value, derived from the consumer's total willingness to pay, will generally exceed the total amount that consumers actually pay. The resulting difference between these prices is their net benefit from the purchase, or the "consumer's surplus."³⁶

33. 94 N.J. 169, 463 A.2d 298 (1983).

34. *O'Brien v. Muskin Corp.*, 94 N.J. 169, 185, 463 A.2d 298, 306 (1983). In *O'Brien*, the plaintiff sued Muskin Corp. in an attempt to recover for injuries caused by the defendant, who was marketing an allegedly defective above-ground swimming pool. *Id.* at 175-76, 463 A.2d at 301. The issue of whether the fact that the defendant pool manufacturer used a state-of-the-art material to prevent potential injuries to consumers should be included in the risk-utility measure raised. *Id.* at 182-83, 463 A.2d at 305. Eventually, the court questioned whether a luxury product that failed the risk-utility test was appropriate to be placed in the stream of commerce at all. *Id.* at 184-85, 463 A.2d at 306.

35. See R. POSNER, *ECONOMIC ANALYSIS OF LAW* 4 (3d ed. 1986) (stating that in economic terms value is defined by willingness to pay); G. STIGLER, *THE THEORY OF PRICE* 71-74 (3d ed. 1966) (discussing application of utility theory).

36. See Larsen, *supra* note 7, at 2054-55 (explaining concept of consumer surplus).

The second factor, which involves the product's safety, takes into account the frequency and severity of likely injury from the product. It also considers the changes that can be achieved through actions by either the manufacturer or the user. This risk-utility component is well-specified and should clearly be central to any assessment of the presence of a product defect.

Factor three, dealing with the availability of substitute products, is very difficult to assess on a practical basis. The availability of substitutes is not a separate attribute for evaluation because the determination of a product's utility under factor one will have already taken substitutes into account.³⁷ In particular, factor one should be interpreted as the utility and desirability of the product, given the prices and availability of substitute products. Measures of consumer willingness to pay are already conditioned on the current set of substitute products.³⁸

The availability of substitutes, however, does highlight a form of test that can be applied to a product. If a product was found to be too risky to be marketed, the attractiveness of the available substitutes would determine the desirability of keeping the product on the market. In some cases, a product might be banned before a substitute is even available. If, for example, freon is banned as an overly risky refrigerant, then the prospects for technological progress leading to the development of substitute chemicals must be considered.

The fourth factor, which relates to the manufacturer's ability to alter the product, pertains to the nature of the test being applied. Thus, the current product may pass a risk-benefit test, but there may be, nonetheless, alternative product designs that are superior. Has the firm's choice across product variants been optimal? What are the costs and benefits associated with these modifications? The issue is not whether safer product alternatives are available, but whether, from a total risk-utility perspective, the best product has been selected. If consumers are cognizant of the risks, a competitive market will ensure that the product mix is optimal so that courts need not make any assessments in such instances.³⁹

The fifth factor, which pertains to the user's ability to exercise precautions, is clearly relevant, particularly if the user can reduce the risk more efficiently than can the producer. Even if it is the case that the user is the cheapest cost avoider, the firm may bear a re-

37. *See id.* at 2054 (relating that availability of substitutes will affect consumers' demand for products).

38. *See id.*

39. *See G. STIGLER, supra* note 35, at 215-16 (noting effect of consumer information on amount of product differentiation).

sponsibility to provide the information needed to motivate any precautionary behavior. Therefore, the interaction with hazard warnings, accounted for in factor six, is of consequence, because these warnings often alert the consumer to the risks involved with a product.⁴⁰ The costs imposed on the consumer by these precautions are also of consequence.⁴¹

The sixth factor, which deals with risk awareness, should really be viewed as a prerequisite toward efficient market operation, either in terms of efficient product choice or precautionary behavior. Because warnings play a potentially central role in establishing this awareness, this factor introduces another dimension for assessing the product's risk and utility. If consumers are fully cognizant of the risks and purchase a product voluntarily, then the presumption should be that the product passes a risk-utility test.⁴² In addition, consumers presumably would understand the properties of substitute products as well, and if these were preferable, consumers would purchase them, and producers would provide them.

D. *The Producer as Insurer*

The seventh factor that Dean Wade discusses is whether it is feasible for the producer to act as the insurer for its own products.⁴³ By compensating accident victims, a product could bear the expected costs of any product-related injury.⁴⁴ The producer would then shift this cost, at least in part, to consumers of the product through higher prices.⁴⁵ Consequently, consumers buying the product would, in effect, be simultaneously purchasing an insurance policy.⁴⁶ Although the insurance objective may be a valid ancillary ob-

40. See *infra* notes 131-53 and accompanying text (assessing function of hazard warnings and discussing products that have open and obvious dangers).

41. See *infra* notes 144-51 and accompanying text (discussing consumers' costs in complying with hazard warnings in order to use product safely).

42. With full information and no impediments to competitive markets, such as search costs, market outcomes will be efficient. The efficiency property implies that benefits exceed costs. For a discussion on the absence of a role for liability with fully informed consumers, see Spence, *Consumer Misperceptions, Product Failure, and Product Liability*, 44 REV. ECON. STUD. 561 (1977).

43. Wade, *supra* note 3, at 837-38 (noting that feasibility may depend on manufacturer's ability to include insurance in price of product or on ability of producer to obtain insurance policy).

44. See *Beshada v. Johns-Manville Prods. Corp.*, 90 N.J. 191, 209, 447 A.2d 539, 547 (1982) (approving of producer liability on insurance theory because manufacturers and distributors can afford costs more easily than injured consumers).

45. See *id.* (asserting that in many cases partial price increase will allow all those who benefit from product—producers and consumers—to help bear costs associated with product). *But see id.* (recognizing that prices will have to increase across board to insure against liability for unknown hazards).

46. See *id.* (suggesting that price of product include price of insurance against future liability).

jective in some products liability contexts, it does not establish an appropriate general basis for liability.⁴⁷

First, and most important, strict liability is not tantamount to absolute liability,⁴⁸ for the objective of tort law is not to make the producer the insurer of all product-related injuries.⁴⁹ If that were the case, compensation would be divorced from causality, and tort liability would serve as a large scale social insurance program.⁵⁰ Car manufacturers, for example, would pay for all damaged cars as well as all lost earnings and medical bills of those involved in car accidents. In addition to raising the cost of cars dramatically, this approach also would severely reduce a driver's incentive to drive cautiously.⁵¹

A more moderate alternative is to have the producer act as insurer only when its product "caused" the accident.⁵² An economic analysis of causality, however, turns on whether it is cheaper for the producer or for the consumer to reduce the probability of an accident. In other words, the extent to which a party "caused" the accident depends on whether that party could have made additional efforts or safety expenditures that were relatively more productive and economical than the other party's efforts or expenditures. After all, a product is not defective simply because the producer did not offer an accident insurance policy to accompany it. If the producer were a cheaper cost avoider and "caused" the accident, then the product should be subjected to a risk-benefit test to determine whether or

47. If insurance alone were the objective, there would be no liability tests of any kind. Firms would pay for all product-related injuries irrespective of the presence of a product defect.

48. See *O'Brien v. Muskin Corp.*, 94 N.J. 169, 192-93, 200-01, 463 A.2d 298, 310-12, 314-15 (1983) (Schreibner, J., concurring and dissenting) (emphasizing that concepts of strict liability and absolute liability are separate, and that holding that no product defect is necessary to find producer liable, improperly holds producer absolutely liable); D. DOBBS, R. KEETON & D. OWEN, *PROSSER AND KEETON ON TORTS* 610-11 (Student ed. 1984) (discussing strict liability and explaining that liability under strict liability is not absolute).

49. See Wade, *supra* note 3, at 828 (using several examples to illustrate that tort law has objective of requiring more than factual causation for liability). Wade notes, for example, that match manufacturers are not liable for all goods destroyed by fire. *Id.*; see Stewart, *Crisis in Tort Law? The Institutional Perspective*, 54 U. CHI. L. REV. 184, 185-86 (1987) (stating broad objectives of tort law are compensation, deterrence, and condemnation).

50. See *id.* (explaining that concepts of causality and fault limit liability for torts). But see Priest, *The Current Insurance Crisis and Modern Tort Law*, 96 YALE L.J. 1521, 1525 (1987) (asserting that expanded tort liability is method of insuring individuals who have neglected to or who cannot afford to purchase insurance). Priest believes that the social insurance rationale pervades current tort law as an expression of humanitarian values in our culture. *Id.* Priest maintains that tort law has failed to achieve many of society's social insurance objectives. *Id.*

51. *Contra* Wade, *supra* note 3, at 826 (remarking that driver who is not deterred by potential of injury to himself will not be deterred by possibility of financial loss).

52. See *id.* at 828 (stating that courts have traditionally limited concept of strict liability with concepts of proximate cause and plaintiff fault: contributory negligence, assumption of risk, and misuse).

not the benefits of safety expenditures are below costs. If the product passes such a test and the producer is nevertheless found liable for the injury, then presumably the justification for doing so is based on equity and justice rather than on a failure to strike an appropriate risk-benefit balance.

Another problem with shifting the insurance function stems from the fact that the courts are relatively inefficient insurers compared with private insurers.⁵³ Whereas administrative costs of insurance consume roughly twenty percent of the premium dollar,⁵⁴ the standard contingency fee arrangement calls for a much larger stake.⁵⁵ Additionally, court actions involve long delays, a probability that the claimant will receive no reward at all, and the likelihood that the claim will be settled out of court for an amount less than originally desired.⁵⁶

A general disadvantage of having the producer act as the insurer is a problem known as "moral hazard."⁵⁷ That is, the producer is

53. See Priest, *supra* note 50, at 1553-55 (discussing lack of incentive for tort claimants to limit medical bills, and comparing tort claimant to insurance claimant who is forced by insurance company and deductible to obtain medical care only when necessary). Priest states that tort law claims are 64% to 134% greater than claims paid through private insurance. *Id.* at 1556. Priest denies that greater recovery is necessarily beneficial to consumers as a group; it is inefficient to pay claimants more than their loss because these claimants, pre-loss, would not have paid premiums to support the possibility of a greater-than-loss recovery. *Id.* at 1556-57.

54. See *id.* at 1560 (providing statistics that indicate between 10% and 21% of insurance premiums are used for administrative costs).

55. See *id.* at 1556 (estimating average contingency fee at 33%). In addition, Priest estimates tort law administrative costs at 53% of net plaintiff benefits. *Id.* at 1560.

56. See Viscusi, *Structuring an Effective Occupational Disease Policy: Victim Compensation and Risk Regulation*, 2 YALE J. ON REG. 53, 68-69 (1984) (noting various problems associated with court proceedings). The inefficiencies of the courts as insurers are particularly well documented in the case of asbestos. See *id.* 67-68 (outlining inefficiencies of court system in compensating asbestos victims). These inefficiencies include: 1) asbestos workers may have been exposed to asbestos multiple times, while working for several different employers, each of whom used several different suppliers resulting in problems proving causality; 2) the statute of limitation on the tort action may expire before the worker's illness becomes apparent, or before the connection between the illness and asbestos is realized; 3) the defendant may be judgment-proof because of the high cost of previous claims against it; 4) the defendant's insurer may also be judgment-proof for the same reason; 5) worker's compensation laws may bar claims of those who worked for a producer; 6) inconsistent levels of success in cases brought; 7) inconsistent damage awards in cases brought successfully; 8) tort system may result in multiple claims for some victims, but none for others similarly affected by asbestos, because of factors one through seven. *Id.* But see Priest, *supra* note 50, at 1569-70 (suggesting that asbestos may be one product that cannot be insured successfully by either insurance companies or producers through tort law because asbestos may be too risky to produce at all).

57. See Priest, *supra* note 50, at 1547 (defining moral hazard as effect of existence of insurance on level of insurance claims made by insured). In other words, the insured may choose to avail herself of more remedy, such as medical care, because insurance will pay for it, even though she did not purchase the insurance in order to be entitled to a higher level of care — just the level of care she deemed adequate. *Id.* at 1547-48. Moral hazard can be reduced by having the insured pay a deductible or coinsurance payment, or by putting a cap on the amount of insurance payments the insured may receive under each policy or for each insurable event. *Id.* at 1548; see K. ABRAHAM, *DISTRIBUTING RISK* 35 (1986) (explaining moral

subject to risks it cannot calculate because it is unable to monitor how its products are used. The producer also is unable to monitor all of the other health-related activities in which the individual consumer will engage during his or her lifetime.⁵⁸ This monitoring dilemma is one reason why the government has established the Consumer Product Safety Commission and other regulatory agencies instead of relying simply upon the courts to handle consumer risks.⁵⁹ Even the workers' compensation system does a very poor job in providing for effective insurance because of the complex causality problems that are involved in the case of health risks.⁶⁰ It should also be noted, however, that the analogy to workers' compensation breaks down in the consumer products context. Whereas the employer can monitor workers at the workplace, the producer cannot monitor the consumer's behavior.⁶¹

It is also not feasible for any organization to act as the insurer in situations involving highly correlated risks.⁶² Such risks create great difficulty because they are statistically dependent and are not accompanied by an offsetting risk.⁶³ In general, the insurance industry writes policies for uncorrelated risks and pools them in their portfolio

hazard as possibility that insured will take risks would not have been taken if she were uninjured); Epstein, *Products Liability as an Insurance Market*, 14 J. LEG. STUD. 645, 653 (1985) (discussing examples of moral hazard).

58. See Stewart, *supra* note 49, at 193 (suggesting that because producers have no way to weed out careless consumers, perhaps contributory or comparative negligence should be restored, or contractual arrangements between producer and consumer should be changed to reflect producer liability for consumer actions).

59. VISCUSI, REGULATING CONSUMER PRODUCT SAFETY 8-16 (1984) (outlining role of courts in area of products liability and need for government intervention).

60. See Viscusi, *supra* note 56, at 62-65 (outlining coverage available through workers' compensation system, and problems of system that make it inaccessible to workers). These problems include: 1) the requirement of a medical determination that the workers' occupation caused the disease; 2) long incubation period of disease impairs causation and workers' ability to gather evidence that disease is job-related; 3) stringent statutes of limitations that begin running on date "accident" occurred rather than date injury was discovered; 4) inconsistent claim awards; 5) low average amount of awards when compared to awards in successful product liability suits. *Id.*; Stewart, *supra* note 49, at 191-93 (discussing differences between proving occupational and consumer injuries). See generally Gold, *Causation in Toxic Torts: Burdens of Proof, Standards of Persuasion, and Statistical Evidence*, 96 YALE L.J. 376 (1986) (reviewing complicated techniques used to prove causation in toxic tort cases).

61. See Stewart, *supra* note 49, at 193 (expressing that employers have degree of control over workers that producers do not have over consumers); see also Priest, *supra* note 50, at 1557-58 (noting that manufacturer must sell product to all who wish to buy it without being able to distinguish between consumers for insurance purposes).

62. See Priest, *supra* note 50, at 1540 (explaining that risks must be uncorrelated (i.e. statistically independent) in order to ensure that insurer will not have too many claims to pay from same event). For instance, all claims arising from a nuclear war would be correlated (occur at the same time), whereas claims arising from auto accidents and from house fires would be uncorrelated. *Id.*

63. Priest, *supra* note 50, at 1544. Insurers avoid this problem by developing a portfolio of policies for products that have uncorrelated risks. *Id.*

lio,⁶⁴ so as to ensure that the average losses from year to year will be fairly smooth and will be in line with the premiums paid.⁶⁵ Therefore, the insurance approach may be feasible in product defect situations that occur on an occasional basis,⁶⁶ but this approach would be impractical where there are major insurance costs associated with an entire product line.⁶⁷

As the experience in the asbestos industry has shown us, highly correlated risks did not lead to risk spreading but instead led to the shutdown of the industry.⁶⁸ The potential value of the asbestos-related claims exceeded not only the resources of the asbestos industry but also that of their insurers.⁶⁹ As a result, Johns-Manville, a leading asbestos producer, was required to reorganize under Chapter 11 procedures.⁷⁰ It is noteworthy that in *Beshada v. Johns-Manville Products Corp.*,⁷¹ the court articulated a risk-spreading objective of products liability, even though the scale of the risk made risk-spreading infeasible.⁷²

Another difficulty with having the producer act as the insurer arises with respect to health hazards involving severe causality problems.⁷³ In many cases, the scientific evidence is so imprecise

64. *Id.* Portfolios may contain either broad or narrow pools of risk. *Id.* at 1545. Narrow risk pools may be attractive to the insured because the premium will more closely reflect the individual's probability of risk. *Id.* For instance, separating health insurance pools of smokers and non-smokers provides the benefit of lower premiums for non-smokers, and will attract non-smokers to that insurer. *Id.* Likewise, broad insurance pools benefit the insured by allowing insurance of specific and unusual risks, and by offsetting these with uncorrelated risks of a similar level. *Id.* at 1544.

65. See *id.* at 1540 (describing how insurance companies are able to pay claims and still stay in business); Epstein, *supra* note 57, at 649 (explaining how insurance industry maintains overall financial stability).

66. See Epstein, *supra* note 57, at 664-65 (distinguishing traditional single-occurrence risk from design defects that involve systemic risk).

67. Priest, *supra* note 50, at 1544. The reason is that the risks from a product line are likely to be highly correlated. *Id.*; Epstein, *supra* note 57, at 665 (using example of DES).

68. See *Beshada v. Johns-Manville Prods. Corp.*, 90 N.J. 191, 209, 447 A.2d 539, 547 (1982) (finding broad liability for asbestos producers). It is currently believed by some commentators that asbestos may be too risky to produce. Priest, *supra* note 50, at 1570.

69. Viscusi, *supra* note 56, at 55 & n.11.

70. See *id.* at 53 & n.2 (citing *In re Johns-Manville Corp.* Nos. 82B11, 656-76 (Bankr. S.D.N.Y. Aug. 26, 1982) and Note, *The Manville Bankruptcy: Treating Mass Tort Claims in Chapter 11 Proceedings*, 96 HARV. L. REV. 1121 (1983)); Viscusi, *supra* note 56, at 55 & n.10 (providing statistics emphasizing magnitude of claims against asbestos producers).

71. 90 N.J. 191, 447 A.2d 539 (1982).

72. *Beshada v. Johns-Manville Prods. Corp.*, 90 N.J. 191, 205-06, 447 A.2d 539, 547 (1982); see *supra* notes 68, 70 and accompanying text (explaining infeasibility of risk-spreading in cases of asbestos). The *Beshada* court may have broadened liability because it was concerned that otherwise a large number of plaintiffs would not be compensated. See *Beshada*, 90 N.J. at 197-98, 447 A.2d at 542-43 (noting that single trial judge was assigned to hear asbestos litigation in one county, and that *Beshada*, which consolidated six cases, dealt with claims of 58 plaintiffs). *Beshada's* application was later limited to asbestos litigation. *Feldman v. Lederle Lab.*, 97 N.J. 429, 454-55, 479 A.2d 374, 388 (1984).

73. See K. ABRAHAM, *supra* note 57, at 51 (citing long latency period, difficulty in identify-

that the extent of the linkage between the product and the risk remains uncertain even on an average prospective basis.⁷⁴ After the fact, causality becomes much more difficult to determine given the highly varied set of activities and personal consumption habits of individuals over their lifetimes.⁷⁵ In situations in which there are multiple causes and long time lags, it is difficult to establish a meaningful basis for assessing the appropriate insurance.⁷⁶ This uncertainty may be of substantial consequence. If, for example, we were to compensate all cases of lung cancer of asbestos workers rather than only the expected number of cases based on current dose-response relationships, expected insurance costs would rise by an order of magnitude.⁷⁷

In these situations, the tort system is simply not an effective remedy. This point has been made not only with respect to asbestos⁷⁸ but also in the case of Agent Orange.⁷⁹ Society, however, is not entirely powerless in these situations because government regulation often represents a more appropriate policy alternative.⁸⁰

In situations involving long time lags, a pivotal limitation of having the producer act as the insurer is that it is not feasible to shift a highly changing accident or illness burden. The loss spreading notion is simply inappropriate in the case of producer-originated product insurance.⁸¹ If there is a lag of two or three decades before the adverse health effects become known, the charge that would be

ing specific chemicals to which plaintiff was exposed, and lack of scientific knowledge about ability of chemicals to cause harm, as hurdles to causation); Viscusi, *supra* note 56, at 54 (enumerating these problems).

74. See Gold, *supra* note 60, at 379-80 (stating difficulty in finding definite linkage between product and disease using epidemiological population studies).

75. See Viscusi, *supra* note 56, at 58-59 (listing some factors that may influence health effects of product on individuals). These factors include but are not limited to demographic/racial group of individual, cigarette smoking, and genetic susceptibility of individual. *Id.*

76. See *id.* at 67 (noting that these factors also made proof of proximate cause extremely onerous).

77. See *id.* at 74.

78. See *supra* notes 68-73 and accompanying text (explaining failure of tort system to compensate asbestos plaintiffs).

79. See generally P. SCHUCK, *AGENT ORANGE ON TRIAL: MASS TOXIC DISASTERS IN THE COURTS* (1987) (discussing agent orange cases). Causation was extremely difficult to prove in these cases. *Id.* at 29-30, 185-86, 268-72.

80. See Stewart, *supra* note 49, at 190, 195 (mentioning ways that regulation is already used in place of tort system). These include health and safety regulations, and schemes to provide compensation administratively or through no-fault programs. *Id.*; see Viscusi, *Toward a Diminished Role for Tort Liability: Social Insurance, Government Regulation, and Contemporary Risks to Health and Safety*, 6 *YALE J. ON REG.* 65, 66, 70-71, 76-78 (1989) (discussing current and possible future role of several regulatory agencies); see also Viscusi, *supra* note 56, at 60-62 (evaluating success and failure of OSHA regulations).

81. See *Beshada v. Johns-Manville Prods. Corp.*, 90 N.J. 191, 197, 447 A.2d 539, 547 (1982) (recognizing that spreading cost of injuries among those who produce is preferred over spreading costs on innocent victims).

needed to settle all past liabilities would greatly exceed the value of the insurance to current consumers of the product.⁸² Thus, the insurance analogy breaks down. Even if the scale of the health risks involved were not substantial, this huge discrepancy in the timing of the consumption and the timing of the potential health costs undermines any attempt to establish a meaningful linkage between the two.

The emergence of the risk-spreading objective within the risk-utility test, in particular, and strict liability, more generally, may have been a product of its historical context. At the time when these doctrines were introduced, federal social insurance efforts were not well established.⁸³ Moreover, private health insurance coverage was not nearly as extensive as it is today.⁸⁴ With the substantial expansion of health insurance as an employee fringe benefit, the insurance gap that tort liability might fill is not great. Indeed, concern has shifted to dealing with overinsurance, as individuals today may have multiple forms of recovery for the same accident.⁸⁵

A final limitation of having producers act as insurers is that, in effect, each risk will be insured separately. From an insurance standpoint, such coverage is less efficient than comprehensive coverage.⁸⁶ In addition, it raises the problem of overlapping coverage and the need for complex subrogation rights to handle the overlaps that occur.

Providing insurance may be a laudable objective but it may not be economically desirable in many instances.⁸⁷ The insurance objective may come into play as an additional dividend of compensating victims of manufacturing defects provided there are a modest number of accidents. Design defects that involve large-scale risks and product defects that lead to deferred health risks, however, do not provide attractive settings for utilizing product liability as an in-

82. See Schwartz, *Product Liability, Corporate Structure and Bankruptcy: Toxic Substances and the Remote Risk Relationship*, 14 J. LEG. STUD. 689, 729-30 (describing how companies pay for current liabilities for past products).

83. Priest, *supra* note 50, at 1586.

84. U.S. BUREAU OF THE CENSUS, STATISTICAL ABSTRACT OF THE UNITED STATES 1988, at 92 (1988); Priest, *supra* note 50, at 1552. *But see* Priest, *supra* note 50, at 1586 n.251 (noting that as many as 35 million people may be uninsured, but that because not all people make claims each year, only portion of those uninsured receive insufficient health care due to lack of insurance).

85. See K. ABRAHAM, *supra* note 57, at 141-48 (discussing methods of coordinating various coverage which insured may have).

86. Eisner & Strotz, *Flight Insurance and the Theory of Choice*, 69 J. POL. ECON. 355, 363 (1961) (discussing undesirability of single risk coverage, such as flight insurance).

87. See Epstein, *supra* note 57, at 668-69 (advocating return to more limited rules of product liability).

urance mechanism.⁸⁸

II. ALTERNATIVE RISK-UTILITY MEASURES

This Article will show that from an economic standpoint more than one risk-utility test is needed because the components of the test differ depending on the context.⁸⁹ Table 2 summarizes three alternative approaches that one might implement to devise meaningful risk-utility measures. The main distinction between each of these three tests is that profits to the firm are not factors in the purchaser's test but they are included in the other tests. The following sections describe the different characteristics and components of each approach.

A. Purchaser's Risk-Utility Test

The first test is a measure of the purchaser's risk-utility. The purpose of this test is simply to measure whether the average consumer's expected benefit derived from a product would outweigh his or her expected costs.⁹⁰ Disregarding the product's profitability, this test seeks only to determine whether there is a net benefit to the purchaser.

The informational standard used in this analysis is what the producer should have known about the risk at the time of production. This amount of knowledge may be more than the producer actually had, particularly if the producer did not undertake product risk research or did not monitor product-related accident reports. The test, however, should not assume that producers had advanced knowledge that was otherwise not available and which they could not have acquired in the normal course of their operations. Thus, the imposition of retroactive liability on asbestos producers, which the court proposed in *Beshada*, is not consistent with the test that this Article sets forth.⁹¹ The issue is not whether in retrospect the

88. The large scale of risks will impose substantial product costs so that consumers will not be willing to pay for the risk insurance through higher prices. The time lag is important because consumers today have no economic motivation for paying the higher prices associated with products that are currently safe in order to fund the insurance costs of products that previously involved high risks.

89. See *infra* notes 133-87 and accompanying text (explaining contexts in which alternative approaches would be used).

90. See Wade, *supra* note 3, at 834-35 (describing basic question asked in risk-utility analysis). This test is new only in terms of its implementation because it calculates the same basic risk-utility measure introduced by Wade in his seminal article. See Wade, *Strict Tort Liability of Manufacturers*, 19 Sw. L.J. 5, 17 (1965) (enumerating factors first offered by Wade).

91. See *Beshada v. Johns-Manville Prods. Corp.*, 90 N.J. 191, 204, 447 A.2d 539, 546 (1982) (finding fact that producer could not have known consequences of asbestos irrelevant to question of producer's liability). Courts following *Beshada* have, in essence, required pro-

TABLE 2
RISK-UTILITY MEASURES

	Risk-Utility Reference Point		
	Purchaser	Private	Social
<u>Benefit Components</u>			
Consumer willingness to pay for product	X	X	X
Profits		X	X
Taxes			X
Benefits to other parties			X
<u>Cost Components</u>			
Purchase cost	X	X	X
Unexpected injury cost	X	X	X
Costs to other parties			X

product should have been marketed, but instead whether a producer making a socially oriented product risk decision, behaved in a proper manner based on the state of knowledge at that time.⁹²

It should also be noted that this test primarily focuses on the entire class of product purchasers, not just the individual consumer involved in a particular liability case. Some individuals will always be unhappy with a particular product, but this test only requires that, on average, the product's benefits will outweigh its costs. Certainly, one might envision a stringent liability criterion that requires that every consumer reap benefits in excess of the expected costs. Such a test, however, would only be appropriate if the producer could in fact distinguish the merits of the product for each consumer and then charge a person-specific price to reflect the differences.⁹³ Unfortunately, such fine tuning and discriminatory pricing

ducers to know what was technologically impossible to know at the time the defective product was manufactured. *Beshada*, for instance, made asbestos manufacturers liable for injuries they had no idea would result. Short of this, however, courts have adopted a strict liability test if the producer did not inspect for defects. See *Greenman v. Yuba Power Prods., Inc.*, 59 Cal.2d 57, 60, 377 P.2d 897, 900, 27 Cal. Rptr. 697, 700 (1963) (finding producer liable for lack of inspections).

92. This formula is not foreign to the product liability field. See *Birnbaum & Wrubel*, *supra* note 2, at 31 & n.3 (noting cases either using or rejecting "state of the art" defense). Before *Beshada*, courts applied a "state of the art" defense in which a producer defending against a negligence claim could argue that it was scientifically impossible to know that a defect would occur based on the state of technology at the time of manufacture. *Id.* This would immunize the defendant manufacturer from liability. *Id.*

93. By definition, discriminatory pricing charges each consumer his or her reservation price. As was noted above, consumer surplus arises from the spread between the price charged and the maximum amount consumers are willing to pay. If producers could extract this maximum amount from each consumer, they could capture the value of the consumer's surplus.

is not feasible,⁹⁴ and is irrelevant to the broader, more important question of whether a product design is appropriate for an entire market. Class actions are therefore better suited to make such judgments, although regulatory agencies with specified expertise are the ideal forum.⁹⁵

The components of the purchaser's risk-utility test appear at the top of Table 2. The first component is the value of the product to the consumer, or the consumer's total willingness to pay for the product. The determination of the value is not a mystical issue that turns on an external observer's assessment of what is valuable and what is not. Rather, economists, utilizing a well established methodology for approaching this issue, ascertain the maximum amount consumers are willing to pay for the product.⁹⁶ The schedule for this maximum willingness-to-pay value is given by the demand curve for the product which has been estimated for many products.⁹⁷

The next component considers the costs involved in the purchase, one of which is the purchase price. The costs must first be subtracted from the amount that consumers would be willing to pay in order to obtain a net-willingness-to-pay figure, or as was previously defined, the "consumer's surplus."⁹⁸ After this computation, one must next subtract any unexpected injury costs associated with the product. Expected injury costs, however, are not subtracted because they will have already been internalized through the price that consumers are willing to pay. This latter point, developed by Adam Smith, has found approval in a number of studies in both the labor market as well as the product market.⁹⁹

94. G. STIGLER, *supra* note 35, at 71-74 (explaining use of "rational consumer" in evaluating utility and pricing).

95. See Viscusi, *supra* note 80, at 76 (positing that regulatory agencies are best forum for forecasting risk information).

96. E. STOKEY & R. ZECKHAUSER, *supra* note 31, at 149-51.

97. Such estimates are calculated through econometric procedures. For a discussion of various models for evaluating economic demand curves, see S. PUDNEY, *MODELLING INDIVIDUAL CHOICE: THE ECONOMETRICS OF CORNERS, KINKS, AND HOLES* (1989); P. SIMMONS, *CHOICE AND DEMAND* (1974); J. CHIPMAN, *PREFERENCES, UTILITY AND DEMAND* (1971); H. THEIL & K. CLEMENTS, *APPLIED DEMAND ANALYSIS: RESULTS FROM SYSTEM-WIDE APPROACHES* (1987).

98. G. STIGLER, *supra* note 35, at 78-81 (reviewing concept of consumer's surplus). Consumer's surplus represents the net gain of the purchase to the consumer, excluding all anticipated costs associated with the product. See J. STIGLITZ, *ECONOMICS OF THE PUBLIC SECTOR* 259-60 (1988) (noting that consumer's surplus represents consumer's willingness to pay above and beyond price). The computation would read as follows:

consumer surplus = utility-cost.

See *supra* note 36 and accompanying text (describing consumer surplus calculation).

99. See, e.g., W. K. VISCUSI & W. A. MAGAT, *LEARNING ABOUT RISK: CONSUMER AND WORKER RESPONSES TO HAZARD INFORMATION* 83-97 (1987) [hereinafter *LEARNING ABOUT RISK*] (explaining that expected risks are assumed in price paid for product); W. K. VISCUSI, *RISK BY CHOICE* 2, 37-38 (1983) (citing ADAM SMITH, *THE WEALTH OF NATIONS* (1776) and

In assessing the effect of unexpected costs, such as accidents or illnesses, on the total cost, the following three-way breakdown is helpful. First, if consumers on balance overestimate the risk associated with the product, then there are no unexpected injury costs that must be considered. Second, if consumers have full information, once again there are no unanticipated costs with which to be concerned. Finally, where consumers underestimate the risks, the unanticipated cost of the resulting injury or illness must be factored into the analysis. The basic issue will then become whether these unanticipated costs outweigh the consumer surplus.¹⁰⁰ Consequently, the risk-utility measure from the standpoint of the purchaser is whether the consumer's surplus exceeds the unexpected injury costs inflicted by the product.

When deciding whether the costs outweigh the benefits, however, any deferred impacts must be calculated through a process known as discounting.¹⁰¹ Discounting is often applied in court cases in situations where the present value of future lost earnings for accident victims is ascertained.¹⁰² The use of discounting recognizes that a dollar today has a higher value than a dollar in the future even if the role of inflation is excluded.¹⁰³ In terms of the risk-utility measure, any unexpected injury costs tend to be more remote in time than the benefits.¹⁰⁴ In the case of deferred health risks, this time lag must

noting that workers' wages internalize expected risks); W. K. Viscusi, *Alternative Approaches to Valuing the Health Impacts of Accidents: Liability Law and Prospective Evaluations*, 46 LAW & CONTEMP. PROBS. 49, 53-58 (1983) [hereinafter *Alternative Approaches*] (explaining that risks are figured into wages and prices); Oi, *The Economics of Industrial Safety*, 38 LAW & CONTEMP. PROBS. 669, 674-80 (1974) (stating that workers assume risks in wage premium); Oi, *The Economics of Product Safety*, 4 BELL J. ECON. & MGMT. SCI. 3, 11-14 (1973) (explaining risks assumed in price of products). The formula for this concept would be as follows:

utility = purchase price - expected injury cost.

100. The formula for the purchaser's risk-utility test is therefore: risk - utility = consumer's surplus - unexpected injury costs. Consequently, the risk-utility measure from the standpoint of the purchaser is whether the consumer's surplus exceeds the unexpected injury costs inflicted by it.

101. E. STOKEY & R. ZECKHAUSER, *supra* note 31, at 159-68 (explaining discounting process); see EXECUTIVE OFFICE OF THE PRESIDENT, OFFICE OF MANAGEMENT AND BUDGET, *supra* note 31, at 35-36 (discussing role of discounting and current government policies on process of discounting). A formula for the discounting procedure would be:

present value = future value of \$1 in year t is

$$1/(1 + r)^t.$$

where: r = discount rate (interest rate)

t = discount period (number of years).

102. See *O'Toole v. United States*, 242 F.2d 308, 312 (3d Cir. 1957) (allotting damages based on present value); see also R. POSNER, *supra* note 35, at 177-81 (describing judicial use of discounting procedures).

103. See *Alternative Approaches*, *supra* note 99, at 61-62 (explaining reason for discounting and giving examples).

104. Cigarette smoking is a perfect example of a product from which consumers personally benefit immediately, but realize the costs perhaps much later. A substantial debate focuses on whether people use a correct and consistent discount rate when valuing effects,

be taken into account when establishing the appropriate values. If, for example, one were to use a two percent real rate of interest when assessing the value of a dollar thirty years hence, one would find that the present value of the dollar in today's money is only fifty-five cents. Unanticipated future injury costs would consequently be reduced by forty five percent because of this discounting procedure. Although other discount rates and other lag times will produce different reductions in value, the potential importance of discounting in contexts in which there are long time lags between the time of purchase and the time of injury is significant, even when using this relatively low two percent rate of interest.¹⁰⁵

B. *Private Risk-Utility Test*

The private risk-utility test broadens the context for analysis to include effects on the producer, such as the producer's profits. Except for a vague reference to feasibility in factor four, Wade apparently ignores this calculation.¹⁰⁶ If one includes profits, the overall net benefit of the product changes to the sum of the consumers' surplus and producers' profits, less the unexpected injury costs.¹⁰⁷ In the economics literature, the profit component is reflected in the "producer surplus"—a concept which has been a fundamental part of economic analysis for most of the century.¹⁰⁸

The private risk-utility test is therefore a twofold test. First, the product must pass the purchaser's risk-utility test previously discussed. If the product does not pass this test, it should not be marketed even if the producer accrued substantial profits from its sale. This is the case because products should pass an initial test of marketability showing that consumers would buy the product based on their knowledge of the risks at the time the product was produced. Once the product passes this first test, the "threshold risk-utility test," the court should then consider profits, which serve as the standard measure of economic efficiency in economic analysis.¹⁰⁹

particularly when risks and benefits are not simultaneous. See Viscusi & Moore, *Rates of Time Preference and Valuations of the Duration of Life*, 38 J. PUB. ECON. 297 (1989).

105. Thus, the total purchaser risk-utility measure would read:

$$\text{risk-utility} = \text{Consumer surplus} - (\text{unexpected injury cost}) / (1 + r)^t$$

if the injury occurs t years after the product is purchased.

106. See *supra* note 39 and accompanying text (explaining Wade's fourth factor).

107. The private risk-utility measure would therefore be expressed as follows:

$$\text{risk utility} = \text{profits} + \text{consumer surplus} - (\text{unexpected injury cost}) / (1 + r)^t$$

108. J. STIGLITZ, *supra* note 98, at 450 (explaining concept of "producer surplus" as difference between revenues and total variable costs).

109. See R. BYRNS & G. STONE, *ECONOMICS* 13-14 (1984) (explaining difference between consumptive efficiency on one hand and productive efficiency on other). From the perspective of the producer, profits are the measure of productive efficiency. *Id.*

The objective should be to establish the product mix and the set of product attributes that maximizes this net surplus accruing to both the producer and the consumer, subject to meeting the first test.¹¹⁰

C. Social Risk-Utility Test

The social risk-utility test extends the analysis one step further by including any benefits and costs to parties not involved in the transaction.¹¹¹ The cost-benefit components, which are unique to the social risk-utility test, are listed in Table 2. The first component of the test is the tax component, which represents a net gain to society above the cost of producing the product.¹¹² The second factor is the benefit to other parties, such as increased employment that might occur due to the production of the good. Included in this category are the benefits that society gains from risks in the form of reduced pension and social security costs which are not fully internalized in the cost of the product. The third component is the unexpected costs imposed on third parties and which are not internalized by product users. An example would be the unexpected medical costs to third parties as a result of the purchaser using the product.¹¹³

As with the private risk-utility analysis, the consideration of social costs and benefits depends on the passage of the previous tests. Certain external benefits such as increased employment for a depressed economic area may result from the production of certain products, but such benefits may be irrelevant if the product fails one of the first two tests. If a product fails an earlier test in the sequence, a strong performance on a social risk-utility basis may still

110. *Id.* at 15 (taking both consumptive and productive efficiency into account). Essentially, there is a minimum threshold level of utility a product must pass in order to even be placed in the stream of commerce. *Id.* at 494-95. That threshold is met when the product maximizes both consumer surplus and producer surplus—in other words, when the product mix and set of product attributes yield both fully beneficial and fully profitable goods. *Id.* at 500.

111. See Coase, *The Problem of Social Cost*, 3 J. LAW & ECON. 1, 1-44 (1960) (introducing concept of social cost in legal analysis and concluding that calculating effects of externalities and subsequent corrective measures may be more harmful than deficiency government may be seeking to correct); see also E. STOKEY & R. ZECKHAUSER, *supra* note 31, at 273-84 (explaining how social welfare is considered in making macroeconomic decisions).

Once we add the societal effects, the risk-utility formula appears as follows:
 risk utility = profits + consumer surplus + third party benefits - third party costs - unexpected injury costs, where each of these components is appropriately discounted to present value.

112. See 23 THE TOBACCO INSTITUTE, THE TAX BURDEN ON TOBACCO iii (1988) (giving example of benefits society reaps because tobacco industry is taxed).

113. See UNITED STATES DEPARTMENT OF HEALTH AND HUMAN SERVICES, THE HEALTH CONSEQUENCES OF INVOLUNTARY SMOKING—A REPORT OF THE SURGEON GENERAL (1986) (reporting results of research on cigarette smoke's effect on non-smoking members of society).

not be an offsetting factor. One must remember that the fundamental purpose of product liability law is to protect the consumer, not to advance society's broader objectives at the consumer's expense.¹¹⁴

A market that is fully efficient from an economic standpoint satisfies each of these three tests. That is, the product is attractive to consumers (purchaser risk-utility), and has positive private and social utility. Indeed, if the producer and the consumer fully recognize all social repercussions, social welfare would be maximized by an efficient market.

D. Comparison with a Negligence Standard

These risk-utility measures consequently function as a more tightly specified negligence standard. In other words, they help to determine whether the producer exercised an appropriate degree of care for the consumer's welfare in the design of the product. Two distinctions, however, are most salient. First, the question being posed in a negligence case is one of fault. It asks whether the producer had knowledge of the risk and failed to act upon this knowledge in a responsible manner.¹¹⁵ Under a risk-utility analysis, however, a firm need not know the risk, have "constructive knowledge" of the risk, or be inflicting an intentional harm. Rather, the issue is simply whether the product design passes a particular test of desirability, assuming that the defendant had knowledge of the risk.¹¹⁶

A second distinction is that the insurance/risk spreading objective does not arise under negligence. Instead, this objective is a component of strict liability and risk-utility analysis, as Wade and others view the approach.¹¹⁷ Such an objective, however, is not part of the formulation outlined within this Article.

114. Perhaps the best forum for evaluating social costs and benefits is not in the courts, but in regulatory agencies. Although courts often make societal assessments, regulatory agencies have the expertise necessary to calculate the full societal implications of the sale of defective or dangerous products. See Viscusi, *supra* note 80, at 75-76 (discussing present use of administrative agencies to assess social utility).

115. See *MacPherson v. Buick Motor Co.*, 217 N.Y. 382, 390, 111 N.E. 1050, 1053 (1916) (doing away with old notion that privity is necessary to find negligence in product liability and introducing duty of care owed by producer to consumer). See generally Birnbaum, *supra* note 27, at 593 (providing historical survey of product liability law); Noel, *Manufacturer's Liability for Negligence*, 33 TENN. L. REV. 444 (1966) (discussing negligence standard in product liability).

116. See *Dart v. Wiebe Mfg., Inc.*, 709 P.2d 876, 881 (Ariz. 1985) (noting that test is "whether a reasonable manufacturer would continue to market his products in the same condition as he sold it to the plaintiff with knowledge of the potential dangerous consequences the trial just revealed," quoting *Dorsey v. Yoder Co.*, 331 F. Supp. 753 (E.D. Pa. 1971), *aff'd*, 474 F.2d 1339 (3d Cir. 1973)); see also Wade, *supra* note 3, at 850 (discussing negligence and strict liability and concluding that whether one calls producer's liability negligence *per se* or strict liability is of no consequence).

117. See *supra* note 3 and accompanying text (discussing Wade's article).

III. THREE LIABILITY CONTEXTS OF RISK-UTILITY ANALYSIS

A. *Product Design Defect Tests: Toward Recognition of the Producer*

Risk-utility analysis has played its most important role in product defect cases.¹¹⁸ In these cases, it is applied primarily with respect to the engineering aspects of a product's design.¹¹⁹ For example, litigation involving Honda motorcycles has used the test to determine whether the installation of crash bars should have been required.¹²⁰ In addition to such engineering cases, risk-utility analysis has been applied to issues as diverse as the formulation of pharmaceutical products¹²¹ and the characteristics of construction materials.¹²²

One concern that has not been adequately acknowledged as a legitimate component of risk-utility analysis is that of a producer's profits. The cost to the producer is an essential element of the cost-benefit analysis regarding a design change. Recognition of these costs must, therefore, go beyond Wade's fourth factor which only captures those costs that would make the product too expensive for the consumer.¹²³ Costs that are not fully transmitted to consumers also enter into the analysis.

1. *Application of the product defect test*

Consider the situation in which there is a product defect and in which an injury to the consumer may result. In that situation, we can exclude from consideration the social risk-utility test indicated in Table 2. The issue at stake here is whether the current version of the product has a higher overall performance on a risk-utility basis than does a safer alternative design. Alternative designs, however, should not be required if, instead, additional precautions by the product user would be more attractive on a risk-utility basis. In that situation, the main cost would not be a production cost to the pro-

118. See *O'Brien v. Muskin Corp.*, 94 N.J. 169, 181-84, 463 A.2d 298, 304-06 (1983) (discussing use of risk-utility analysis in product defect cases).

119. See *id.* at 184-85, 463 A.2d at 306 (applying risk-utility analysis to decide whether dimensions and slipperiness of pool made pool design defective).

120. *Comacho v. Honda Motor Co.*, 741 P.2d 1240 (Colo. 1987), *cert. denied*, 485 U.S. 901 (1988).

121. See *Feldman v. Lederle Lab.*, 97 N.J. 429, 444-46, 479 A.2d 374, 382-83 (1984) (acknowledging that risk-utility analysis could be appropriate in some pharmaceutical products cases).

122. See *O'Brien*, 94 N.J. at 184-85, 463 A.2d at 306 (applying risk-utility discussion to determine whether surface material was appropriate for pool). See generally *Barker v. Lull Eng. Co.*, 20 Cal. 3d 413, 573 P.2d 443, 143 Cal. Rptr. 225 (1978) (discussing liability of manufacturer of high-lift loader).

123. See Wade, *supra* note 3, at 837 (offering list of factors to include in analysis of whether product is unreasonably dangerous). This factor excludes consideration of a decrease in the producer's profits.

ducer, but rather the cost of precaution-taking to the consumer. For purposes of subsequent discussion, this Article will assume that the most attractive policy alternative is not to rely upon user precautions. Instead, the possible role of the individual will appear in the section discussing hazard warnings¹²⁴ because that is an additional form of design change that is often subject to a risk-utility test.

In analyzing the desirability of a design change, the question then becomes whether the purchaser's risk-utility value is the pertinent test criterion. As previously stated, the difference between the two tests is that only the latter takes corporate profits into account, whereas the former does not.¹²⁵ The literature and court decisions on risk-utility analysis recognize a potential role of the producer, but this recognition is not fully adequate.¹²⁶ Although factor four indicates that the feasibility of the product design change is an issue, the cost considerations that enter into the analysis are those that would make the product "too expensive."¹²⁷ Although most individuals would probably interpret this concern as the expense of the product to the consumer, the costs of production that are not fully transmitted to the consumer are also relevant to the overall economic impact. Consequently, the appropriate risk-utility measure is the producer's risk-utility test.

2. *An example*

The following example demonstrates why this emphasis is appropriate. Consider two possible design changes for a product. Under the first design change, all of the costs associated with the improved safety are on a per-unit basis for the product. One will achieve safety level R_1 at a cost of an additional \$2.00 per unit. Costs are fully shifted to consumers because the price of a product in a competitive market will be governed by its marginal costs.¹²⁸ This change will boost the product price by \$2.00, and, in effect, consumers will be paying for the full cost of the safety improvement.

Under a second design change, suppose a somewhat lower risk level — $R - \epsilon$ (where ϵ is arbitrarily small) — can be achieved for a cost per unit of \$1.99 plus an additional cost of retooling of \$1,000,000 of fixed costs. If only 100 units of the product are pro-

124. See *supra* notes 131-53 and accompanying text (discussing application of risk-utility test to consideration of hazard warnings).

125. See *supra* notes 90-110 and accompanying text (defining producer's risk-utility value and purchaser's risk-utility value).

126. See *supra* note 123 and accompanying text (discussing inadequacy of Wade's inclusion of producer's interests).

127. See *supra* note 123 and accompanying text.

128. G. STIGLER, *supra* note 35, at 179.

duced each year, the cost per unit for greater safety is \$1,001.99. The second policy option produces only a negligibly smaller risk level than does the first option. Price will reflect marginal costs of safety (\$1.99), not the fixed costs.¹²⁹ The product's cost to consumers is a penny per item less, and if one were to exclude the cost to producers, then the second option would be preferable. If one recognizes, however, as should be the case, the producer's fixed cost of \$1,000,000 for retooling, then the ranking on risk-utility grounds is reversed.

3. *The components of a design defect test*

The overall test for the desirability of a product change is the total benefits and costs to both the producer and the consumer. Accordingly, the risk-utility test must accomplish that which a perfect economic market would accomplish if it was in existence. Such a perfect market would include the cost to both parties, not simply those costs that can be transmitted to consumers through higher prices. Thus, in terms of the appropriate tests for design defects, it is the private risk-utility measure that must prevail.

To calculate the desirability of a product change, one must consider the economic impact of the improved design on each component of the analysis. The first benefit component is the consumer's willingness to pay for the product. The major impact here is that the improved safety of the product that accompanies the improved product design will increase the value that consumers attach to the good. Thus, the consumers' willingness-to-pay value rises. One must assess this net increment in consumers' willingness to pay when evaluating the desirability of the design change because this net increment comprises a main benefit component. Likewise, if safety increases, the unexpected injury cost to the consumer will decline. A decrease in this particular cost component, however, will not affect the amount consumers are willing to pay because it is unexpected anyway.¹³⁰

Another pertinent component is the profit to the producer, which will decrease to the extent the producer can shift the cost of the design change to consumers. The proposed design changes necessarily will impose some additional cost on the producer, or at best be cost-neutral, because the producer chose not to introduce the design change on its own initiative. Indeed, if that form of product

129. *Id.* at 179-80.

130. See *supra* notes 99-105 and accompanying text (discussing unexpected injury cost to consumer).

modification would have boosted profits, the firm would have introduced the change. Thus, any net drop in profits to the producer must be taken into account when assessing the attractiveness of the design change.

The last pertinent aspect is the cost of the product to the purchaser of the goods. As the previous example illustrated, the product price will rise to the extent that the marginal cost of producing the product has risen. Therefore, the consumer will bear at least some of the cost of the safer design through the added purchase price.

Thus, in terms of the factors that have changed, only two components present the beneficial effects of the design modification. These components include the added willingness of consumers to pay for the newly designed product, and the lower unexpected injury costs to consumers. Consequently, one must balance these positive aspects of the design change against the negative impact on the profitability of the producer and the cost of the product to consumers. If, on balance, these positive aspects outweigh the costs associated with the design change, then the current version of the product does not pass the risk-utility test, and the producer should be found liable for having a defective product design.

B. Assessment of Hazard Warnings

The informational issues that arise in the context of hazard warnings are present in all product defect cases.¹³¹ For instance, there must be an implicit assumption that either consumers were not fully informed of the product's risk or that their behavior in response to the warning was not fully rational.¹³² Otherwise, market outcomes with regard to the product would have been efficient, and the so-

131. Informational issues arise with the judicially imposed duty to warn users of the dangers inherent in a product. See RESTATEMENT (SECOND) OF TORTS § 388(c) (1977) (imposing liability for failing to warn users); RESTATEMENT (SECOND) OF TORTS § 402A (1977) (imposing duty to warn users of risks of product); see also *Outlaw v. Firestone Tire & Rubber Co.*, 770 F.2d 1012, 1014 (11th Cir. 1985) (reasoning that Alabama law imposes duty on manufacturer to "acquaint the user with the danger" of using product); *Patch v. Stanley Works*, 448 F.2d 483, 489-90 (2d Cir. 1971) (finding failure to warn of potential dangers gives rise to strict liability); *Basko v. Sterling Drug, Inc.*, 416 F.2d 417, 428 (2d Cir. 1969) (holding that there is no duty to warn for unforeseeable injury); *Beshada v. Johns-Manville Prods. Corp.*, 90 N.J. 191, 204-08, 447 A.2d 539, 546-49 (1982) (stating that strict liability may be found even in cases where danger is unknown, so that inability to communicate risks is not at issue). In addition, the courts have imposed a duty on the manufacturer not only to provide hazard warnings, but to discover latent defects as well. See *Brocklesby v. Jeppesen & Co.*, 767 F.2d 1288, 1297 (9th Cir.) (holding defendant liable for failing to detect defect in product), cert. denied, 106 S. Ct. 882 (1985).

132. See LEARNING ABOUT RISK, *supra* note 99, at 125-26 (arguing that information concerning product risks alters consumer behavior with regard to that product).

cially optimal level of safety would have been provided to the consumers. An inadequacy in information is a frequently cited source of market failure in the context of product safety regulation.¹³³ Therefore, in these contexts, producers should rely upon hazard warnings because these warnings address the source of the inadequacy directly rather than superimposing constraints on a market with respect to product design.¹³⁴

In situations in which there is an inadequacy in consumer information, hazard warnings can potentially fill this void by apprising consumers of the risks posed by a product and any precautions that are necessary to reduce these risks.¹³⁵ Some hazard warnings, however, include no precautionary information, and instead are intended solely to advise consumers whether to purchase and use a product.¹³⁶ In other contexts, the emphasis is upon informing the consumer of steps that can be taken to reduce the risks associated with a product.¹³⁷

Although one can assume that fully informed and rational consumers will generate efficient levels of product safety that would necessarily pass a risk-utility test, one cannot generally assume that firms will always provide the information needed for consumers to reach this position. The main barrier to providing risk information may not be the costs associated with the transmission of this information, such as the cost of putting labels on containers, but rather the concern that warnings may dampen the consumer's demand.¹³⁸ It is often noted that "safety doesn't sell" and that alerting consum-

133. See *id.* at 1 (noting information is central to economic performance); see also Schwartz, *supra* note 11, at 374 (discussing effects of consumer optimism on demands for consumer insurance); Spence, *Consumer Misperceptions, Product Failure and Producer Liability*, 44 *REV. ECON. STUD.* 561, 561-62 (1977) (noting consumer misperceptions providing rationale for intervention into market).

134. See *LEARNING ABOUT RISK*, *supra* note 99, at 1 (indicating that warning labels are primary method of conveying information about risks). This Article uses efficient market outcomes to denote the "clearing" of the market, or the production level at which the price paid for the product will equal the utility derived by the consumer.

135. See *id.* at 2 (noting role of providing information is to influence behavior of individuals). Not only must the information be provided to affect consumer behavior, but it must also be provided in the proper format. See Bettman & Kakkar, *Effects of Information Presentation Format on Consumer Information Acquisition Strategies*, 3 *J. CONSUMER RES.* 233, 233-40 (1977) (describing how format of warnings can affect behavior).

136. Viscusi, *Predicting the Effects of Food Cancer Risk Warnings on Consumers*, 43 *FOOD DRUG. COSM. L.J.* 283, 285-86 (1988) (describing effect of California labeling law of carcinogens and explaining that no precautions other than abstinence would be effective to reduce risks of using products).

137. *Id.* at 285 (discussing results of study which demonstrates improved warning labels will increase usage of precautions to minimize risks of products). An efficient consumer would, supposedly, recognize the risks as set out in the hazard warnings and factor these risks into their utility equation when making the purchase decision.

138. *LEARNING ABOUT RISK*, *supra* note 99, at 96.

ers about a product's risk is likely to depress the demand for it.¹³⁹

In order to evaluate whether a producer should provide a hazard warning, one can implement exactly the same procedure as was undertaken in the case of design defects.¹⁴⁰ After all, a hazard warning is simply another alteration in the product design, much like a punch-press guard or a firewall in a car.¹⁴¹ Thus, the producer's risk-utility test represents the appropriate standard of judgment, not the purchaser's risk-utility measure.¹⁴²

Nevertheless, the components of the analysis are assessed in a somewhat different fashion than in the case of product design changes. In the context of hazard warnings, the main mechanism by which the safety benefits are achieved is through precautionary behavior by the consumer.¹⁴³ In a product design context, however, this safety is achieved through additional production costs of the product.

To determine the consequences of providing a hazard warning, one must again consider the components of the producer's risk-utility analysis. First, consumer willingness to pay for the product may decrease due to the recognition that there are more hazards associated with the product than originally believed.¹⁴⁴ In addition, the

139. *Id.* Note that the manufacturer can affect consumer demand by making the warning label visible and thus making the consumer increasingly aware of the possible risks or dangers involved when using the product. *Id.* In fact, once consumers are apprised of the risks, they may overestimate the probability of the potential injury. *Id.*; see Kahneman & Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 *ECONOMETRICA* 243, 263-74 (1979) (providing over-reaction hypothesis that discusses effects of warnings concerning major injuries and how consumers overweigh probabilities of these injuries). *But see* H. KUNREUTHER, R. GINSBERG, L. MILLER, P. SAGI, P. SLOVIC, B. BARKIN & N. KATZ, *DISASTER INSURANCE PROTECTION: PUBLIC POLICY LESSONS 1-4* (1978) (arguing catastrophic events with low probabilities are discounted by consumers).

140. *See supra* notes 118-29 and accompanying text (describing private risk-utility measure which applies to product defects).

141. In fact, the courts have considered an inherently dangerous product without a warning defective for the purposes of tort law. *See Rhodes v. Interstate Battery Sys.*, 722 F.2d 1517, 1521, *reh'g denied*, 727 F.2d 1116 (11th Cir. 1984) (finding "dangerous product without warning defective," and, thus equating absence of hazard warning with defect). *See also Darte v. Fibreboard Corp.*, 765 F.2d 456, 469 (5th Cir. 1985) (citing *Borel v. Fibreboard Paper Prods.*, 493 F.2d 1076, 1089 (5th Cir. 1973), *cert. denied*, 419 U.S. 869 (1974) (using risk-utility analysis to establish strict liability and finding warnings still necessary)); *Carter v. Massey-Ferguson, Inc.*, 716 F.2d 344, 346 (5th Cir. 1983) (noting product can be defective for failure to warn); *Center Chem. Co. v. Parzini*, 234 Ga. 868, 871, 218 S.E.2d 580, 582 (1975) (declaring that product without adequate warning is defective).

142. In other words, one must take into account the producer's profits on the benefits side of the equation, while the costs remain the same. *See supra* notes 106-10 and accompanying text (describing private risk-utility measure).

143. Thus, there is a duty imposed on the consumer, not the producer, to utilize, in a rational manner, the hazard warnings provided by the producer. *See Rhodes v. Interstate Battery Sys.*, 722 F.2d 1517, 1520 (11th Cir.) (noting recovery is not barred for plaintiff who failed to read warning if producer did not communicate warning effectively), *reh'g denied*, 727 F.2d 116 (1984).

144. This correlates with the first part of the design defect test, which postulates that

costs associated with taking the precautions may also lower consumer willingness to pay.¹⁴⁵ A factor that is likely to partially offset this reduced demand is that consumers may assign a positive value to knowing which precautions to take with a product.¹⁴⁶ The second component, concerning the producer's profits, will also decrease, both because of the direct costs associated with hazard warnings as well as the potential decline in consumer demand for the product.¹⁴⁷ The third component, which is the purchase cost however will increase, as the price of the product rises to reflect the added cost of the warnings.¹⁴⁸ Finally, the unexpected injury costs should decline for two reasons.¹⁴⁹ First, to the extent that consumers are now aware of the product risks, these risks will affect the value consumers are willing to pay for the product.¹⁵⁰ Second, if consumers are given information that enables them to take precautions that will reduce the risks, the overall risk level and the unexpected injury costs should also decline.¹⁵¹

Nevertheless, the details of the calculation often will prove to be superfluous in hazard warning cases. If consumers fully understand the risk as the result of an effective warning, then one need not perform a risk-utility test because the market will have already under-

improved safety will increase the price that the consumer is willing to pay for the product, or the perception of risk will lower demand directly. See *supra* notes 137-42 and accompanying text (discussing consumer willingness to pay); see also E. BARDACH & R. KAGAN, *GOING BY THE BOOK: THE PROBLEMS OF REGULATORY UNREASONABLENESS* 243-44 (1982) (arguing marginal demand can affect producers greatly due to changes in information provided to consumers). This is particularly true if consumers will pay for safety features or are made aware of risks they consider "worthwhile." Schwartz, *supra* note 11, at 367-68.

145. For example, the consumer must factor into the decision of whether to purchase drain opener the cost of purchasing rubber gloves if they wish to use the product in a safe manner.

146. Thus the total cost of the label would be: Perceived Benefit = Utility – Perceived Threat + Value of Known Risks.

147. This component is the second part of the private risk-utility measure, which examines the profits of the firm and the ability of the firm to pass on the design costs to the consumer. See *supra* notes 106-32 and accompanying text (describing components of private risk-utility measure). This correlates to the previous component's drop in demand. Because both components are negative, the total profit effect should be negative.

148. This part is the third component of the private risk-utility measure, which states that some of the cost will be included in marginal production costs, which will have to be passed on to the purchaser, thus increasing the cost of the product. See *supra* notes 106-32 and accompanying text (delineating components of private risk-utility measure).

149. This is the fourth part of the private risk-utility measure, which postulates that the design changes will reduce unexpected costs by reducing unexpected injuries resulting from the product. See *supra* notes 106-32 and accompanying text (describing private risk-utility measure).

150. See *LEARNING ABOUT RISK*, *supra* note 99, at 127 (explaining that prior empirical analysis has demonstrated "high rate of tradeoff between dollars and risk").

151. This statement relies upon the assumption that consumers will follow the warnings; nevertheless, the courts impose a duty on the consumer to use the product consistent with warnings provided. See *Peck v. Ford Motor Co.*, 603 F.2d 1240, 1247-48 (7th Cir. 1979) (stating that manufacturer is only liable for damages when product is used in foreseeable manner).

taken it.¹⁵² The effects of the marketplace will also reflect the value of possible design changes. That is, if consumer expectations follow the true risk levels, then consumer demand patterns will generate appropriate safety incentives for producers. In particular, consumer choices will fully reflect the product's risks and benefits.¹⁵³

Consequently, one can view the risk-utility test for a product as consisting of two stages. If the warning is effective, then the product necessarily passes a risk-utility test because all risk-related costs will be internalized. Only if a warning is not fully informative must one undertake a risk-utility test for either warnings or, more generally, for design defects. In the latter case, the product will pass the risk-utility test only if both the producer's and consumer's utility are positive.

C. *Threshold Decision of Marketability*

The most controversial aspect of risk-utility analysis has been its extension by the court in *O'Brien v. Muskin* to the threshold decision of whether a product should be marketed at all.¹⁵⁴ Traditionally, the focus of risk-utility analysis has been on design defects and on hazard warnings.¹⁵⁵ In those cases, the concern is with possible changes in a product's attributes, but not with the more fundamental concern as to whether a product is too risky to even be marketed. In *O'Brien*, the New Jersey Supreme Court indicated that it is appropriate to apply risk-utility analysis to address this latter concern.¹⁵⁶ These types of categorical applications of risk-utility analysis have

152. This is akin to net consumer surplus without any unexpected injury costs. See *supra* notes 98-100 and accompanying text (describing reduction of risk-utility measure to consumer surplus).

153. See Keeton, *Product Liability and the Meaning of Defect*, 5 ST. MARY'S L.J. 30, 37-39 (1973) (describing how every product has some benefits and some risks, and how this assumption underlies all risk-utility tests). The courts have utilized this test as well. See, e.g., *Hull v. Eaton Corp.*, 825 F.2d 448, 454 (Fed. Cir. 1987) (using risk-utility analysis to account for dangers); *Reed v. Tiffin Motor Homes Inc.*, 697 F.2d 1192, 1197 (4th Cir. 1982) (applying risk-utility and knowable designs for definition of unreasonably dangerous products); *Raney v. Honeywell, Inc.*, 540 F.2d 932, 935 (8th Cir. 1976) (listing relevant factors about knowable risks in using risk-utility analysis); *Morris v. Parke, Davis & Co.*, 667 F. Supp. 1332, 1347 (C.D. Cal. 1987) (using risk-utility analysis for knowable risks only).

154. *O'Brien v. Muskin Corp.*, 94 N.J. 169, 184-85, 463 A.2d 298, 306 (1983) (deciding whether defective swimming pool should have even been marketed).

155. See *Carter v. Massey-Ferguson, Inc.*, 716 F.2d 344, 347 (5th Cir. 1983) (stating that any case which concerns design defect must employ risk-utility analysis). The defect analysis applies to warnings as well as defects because courts have held that the lack of a warning is a "defect." *Kay v. Cessna Aircraft Co.*, 548 F.2d 1370, 1372 (9th Cir. 1977) (deciding that lack of warning indicates product defect); see *supra* note 141 and accompanying text (noting that absence of warning label makes product defective).

156. *O'Brien*, 94 N.J. at 184, 463 A.2d at 306; see *Larsen, supra* note 7, at 2045 (arguing *O'Brien* court's extension of risk-utility test should be rejected).

been increasing in recent years.¹⁵⁷

The appropriate risk-utility measure that one should use in this context is different from the measure used in the other contexts. Rather than being concerned with the manipulation of a product, one must consider the threshold decision of whether to place the product in the stream of commerce. Therefore, attention can be restricted to the purchaser's risk-utility measure, in contrast to the other two contexts where the private risk-utility measure was appropriate.

This threshold test is really a consumer protection standard. Producers need not be protected through a separate test, for if they are losing money on the sales of a product, they can voluntarily choose not to market it. Alternatively, if producers are making substantial profits, but consumer well-being is diminished as a result of unanticipated risks, then the producers should not be permitted to reap such profits at the consumers' expense. Unless a product passes the minimal threshold of promoting consumers' overall interests, it should not be marketed. Only when considering additional changes in the product must one calculate the producer's profits subject to the constraint that the product not make consumers worse off.

The components of the purchaser's risk-utility measure represent a subset of those discussed for product modifications and warnings.¹⁵⁸ Therefore, one must consider only the unexpected injury cost, the willingness of consumers to pay for the product, and the purchase price.¹⁵⁹ If consumers receive full information regarding the risks, incur no unexpected injury costs, and subsequently purchase the product, one can reason that, on balance, their welfare is being enhanced.¹⁶⁰ Thus, this basic principle of "revealed preference,"¹⁶¹ requires no formal risk-utility analysis.

Because of this principle, courts and legal scholars generally have declined to deem "defective," those products whose risks are well-known.¹⁶² Thus, liquor and alcohol, which have common and obvious dangers, require no risk-utility analysis to determine whether

157. 16 Prod. Safety & Liab. Rep. (BNA) No. 10, at 214 (Mar. 4, 1988) (discussing application of risk-utility analysis to product liability cases).

158. See *supra* section III(A)(3) (discussing components of design defect test).

159. This analysis omits the profits of the firm. See *supra* notes 96-99 and accompanying text (indicating components of purchaser's risk utility test).

160. If the product is being purchased, consumers must be gaining some benefits if they are acting as utility maximizers, or, in fact, there must be a consumer surplus (benefit to consumer — costs).

161. G. STIGLER, *supra* note 35, at 68-70 (discussing revealed preference). Even Stigler, however, recognized that to use "revealed preference" without realizing the inherent utility choices that are present would be a falsity. *Id.* at 68.

162. See Wade, *supra* note 3, at 842 (explaining that either warning accompanying product

they should be marketed.¹⁶³ Similarly, courts recognize the danger of handguns but decline to apply the risk-utility analysis to cases involving those items.¹⁶⁴ Finally, tobacco is also a product that poses well-known risks. As the RESTATEMENT (SECOND) OF TORTS observes, the extent to which one assesses whether tobacco has a product defect will be with respect to whether the product is "good" tobacco or whether the product has been tainted in some manner.¹⁶⁵ In the absence of such a defect, tobacco would pass a risk-utility test because of the well-known nature of the risks.¹⁶⁶ Thus, risk-utility analysis plays a more helpful role, from the standpoint of the threshold marketing decision, when the risks are not well known.¹⁶⁷

or public knowledge of apparent danger may be enough to characterize product as safe); *infra* note 163 (providing additional support).

163. Wade, *supra* note 3, at 842; see Keeton, *Products Liability—Current Developments*, 40 TEX. L. REV. 193, 210 (1961) (noting risk-utility test is inappropriate where dangers are "open and obvious"). Dean Keeton argues that open and obvious dangers differ from defects in that the reasonable man would continue to market the product although fully aware of the dangers. Keeton, *supra*, at 210.

The courts also have approved of this theory. See *Garrison v. Heublein, Inc.*, 673 F.2d 189, 192 (7th Cir. 1982) (rejecting contention that there is duty to warn by alcoholic beverage producers because duty to warn not applicable when dangers are obvious); *Abernathey v. Schenley Indus.*, 556 F.2d 242, 243-44 (4th Cir. 1977) (rejecting contention that failure to warn consumers of open and obvious dangers of alcohol consumption constitutes violation of Food, Drug, and Cosmetics Act, 21 U.S.C. §§ 331, 343 & 351 (1982) (listing acts or omissions that constitute violations of Act)).

The government, however, currently requires alcoholic manufacturers to label alcoholic beverages of the dangers. See Alcoholic Beverage Labeling Act of 1988, Title VIII, Pub. L. 100-690, 102 Stat. 481 (1988).

164. See *Patterson v. Rohm Gesellschaft*, 608 F. Supp. 1206, 1211 (N.D. Tex. 1985) (stating that risk-utility test does not apply to handguns which are not defective); see also *Martin v. Harrington & Richardson, Inc.*, 743 F.2d 1200, 1203 (7th Cir. 1983) (noting sales of non-defective handguns does not give rise to strict liability); *Mavilia v. Steoger Indus.*, 574 F. Supp. 107, 111 (D. Mass. 1983) (holding gun is not inherently defective simply because using it can cause death); *Richman v. Charter Arms Corp.*, 571 F. Supp. 192, 198 (E.D. La. 1983) (indicating that marketing handguns is not unreasonably dangerous activity). See generally Note, *Handguns and Products Liability*, 97 HARV. L. REV. 1912, 1917 (1984) (arguing inappropriateness of risk-utility analysis to handgun liability cases).

165. RESTATEMENT (SECOND) OF TORTS § 402A comment i (1977); see *Ross v. Philip Morris, Ltd.*, 328 F.2d 3, 8-13 (8th Cir.) (discussing consumer expectations and product modifications), *modifying*, 164 F. Supp. 683 (1964); *Pritchard v. Liggett & Myers Tobacco Co.*, 295 F.2d 292, 296-98 (3d Cir. 1961) (discussing warranty for fitness of use of cigarettes).

166. The current law for labeling cigarettes is the Federal Cigarette Labeling & Advertising Act of 1965, Pub. L. No. 89-92, 79 Stat. 282 (codified as amended at 15 U.S.C. §§ 1331-1341 (1988)). The Surgeon General has published numerous reports concerning the dangers of cigarette smoking. See, e.g., UNITED STATES DEPARTMENT OF HEALTH AND HUMAN SERVICES, REDUCING THE HEALTH CONSEQUENCES OF SMOKING: 25 YEARS OF PROGRESS—A REPORT TO THE SURGEON GENERAL (1989) (discussing progress in effort to reduce smoking-related diseases); UNITED STATES DEPARTMENT OF HEALTH AND HUMAN SERVICES, THE HEALTH CONSEQUENCES OF SMOKING: NICOTINE ADDICTION: A REPORT OF THE SURGEON GENERAL (1988) (declaring nicotine contained in cigarettes as addictive as heroin); UNITED STATES DEPARTMENT OF HEALTH AND HUMAN SERVICES, THE HEALTH CONSEQUENCES OF INVOLUNTARY SMOKING — A REPORT OF THE SURGEON GENERAL (1986) (reporting results of research concerning third party smokers).

167. Pharmaceutical products present an excellent case where one must assess possible

One might question whether any product that is not found to be defective despite the absence of a warning should, as a result, be exempted from the threshold liability test. A threshold liability test, after all, would apply only to products for which decisions are not informed or rational. This exemption would not be appropriate for the following three reasons. First, although it may be too costly to provide effective hazard warnings, their absence does not necessarily imply that there are no risks associated with the product.¹⁶⁸ Second, the requirements that are placed on hazard warnings are much less than those that have been placed on a market to show that the product was fully effective. Thus, one would want to tighten the warnings requirements if a firm's ability to pass the hazard warnings test implied that it would be exempt from liability. Consumers must receive, fully understand, and act upon a warning for the market to be efficient.¹⁶⁹ Therefore, even a well-designed warning may not be effective in informing consumers.¹⁷⁰ Third, and perhaps most important, is that the tests are different. The warnings test previously outlined is based on the producer's risk-utility of the product after the warnings have been given in relationship to the producer's risk-utility of the product before the warnings have been given.¹⁷¹ In contrast, the threshold marketing test is based on the purchaser's risk-utility, which excludes profits from consideration.¹⁷² Additionally, warnings might not enhance a product because of inadequate consumer choice or extreme costliness of warnings, but a product, nevertheless, may not be in the consumers' best interests.¹⁷³

health risks and health benefits. See PHYSICIANS DESK REFERENCE (43d ed. 1989) (providing warnings, precautions, and adverse reactions associated with these products); see also RESTATEMENT (SECOND) OF TORTS § 402A comment k (1977) (discussing unavoidably unsafe products). Comment k goes on to state that any product which involves a high degree of risk, which is accompanied by a "proper directions and warnings" will not be declared "defective" or "unreasonably dangerous." RESTATEMENT (SECOND) OF TORTS § 402A comment k.

168. See *Woodwill v. Parke Davis & Co.*, 58 Ill. App. 3d 349, 351-52, 374 N.E.2d 683, 685 (1978) (noting product may be defective due to inadequate warning), *aff'd*, 79 Ill. 2d 26, 402 N.E.2d 194 (1988); see also Note, *Strict Products Liability and the Risk-Utility Test for Design Defect: An Economic Analysis*, 84 COLUM. L. REV. 2045, 2046 n.3 (1984) (noting warnings cost nothing).

169. This is a basic assumption of perfect competition in economic models. See generally W. ALBRECHT, *ECONOMICS* 39 (2d ed. 1979) (noting consumer ignorance is major cause for market failure); LEARNING ABOUT RISK, *supra* note 99, at 1-12 (discussing tests and information for hazard warning effectiveness and effect on purchase decisions).

170. See LEARNING ABOUT RISK, *supra* note 99, at 41 (noting placement and format of warning does have effect on informing consumers of hazards).

171. See *supra* notes 131-53 and accompanying text (discussing private risk-utility measure as applied to hazard warning context).

172. See *supra* notes 154-67 and accompanying text (discussing purchaser's risk-utility measure as applied to threshold decision making context).

173. See *supra* notes 165-67 and accompanying text (discussing hazards of cigarettes and liquor).

IV. INFORMATIONAL REQUIREMENTS AND INSTITUTIONAL RESPONSIBILITIES

Since the publication of Dean Wade's article, many have raised the question as to who should apply the risk-utility test.¹⁷⁴ One could pose this question narrowly and simply ask whether it should be in the judge's or the jury's domain.¹⁷⁵ When limited to these options, Wade indicates that it is the court that has the discretion of whether to submit the issue to the jury.¹⁷⁶ Such discretion stems from the fact that risk-utility is considered a question of law and policy—not issues of fact.¹⁷⁷

One also can raise a more fundamental question as to whether the courts, regulatory agencies, or Congress is best suited to undertake the risk-utility analysis.¹⁷⁸ This institutional question only gained prominence with the emergence, in the 1970s, of various regulatory agencies including: the Occupational Safety and Health Administration (OSHA), the United States Consumer Product Safety Commission, and the United States Environmental Protection Agency. In addition, Congress also has become increasingly active in the regulatory area over the past two decades, particularly with respect to products that have attracted major public debate.¹⁷⁹ One such product, cigarettes, has been the subject of extensive Congressional examination and a series of increasingly stringent warning requirements.¹⁸⁰

The issue of the division of labor between the courts, the federal regulatory agencies, and Congress is also pertinent to establishing the appropriate division of labor for the purposes of risk-utility mea-

174. See Note, *supra* note 168, at 2050-51 & n.28 (discussing methodology of court's implementation of risk-utility test as using consumer standard of care); Wade, *supra* note 3, at 838-41 (discussing application of risk-utility analysis); see also K. ABRAHAM, *supra* note 4, at 11-13 (noting insurance law assists performing calculation of risks and costs in economically efficient manner).

175. See Wade, *supra* note 3, at 838-41 (discussing judge's and jury's role in applying risk-utility analysis).

176. *Id.* at 838; see RESTATEMENT (SECOND) OF TORTS § 520 comment 1 (1977) (indicating that determination of strict liability requires court's expertise due to fact it is "characterization of defendant's activities or enterprise").

177. Wade, *supra* note 3, at 838.

178. See generally Viscusi, *supra* note 80, at 65 (discussing ability and efficiency of markets, tort liability, social insurance, and regulation as carrying out risk utility analysis).

179. States have entered into this regulatory arena as well. See Viscusi, *supra* note 136, at 292-96 (discussing California's proposition 65, which sets labeling standards for consumer products).

180. See Comprehensive Smoking Education Act, Pub. L. No. 98-474, 98 Stat. 2200 (codified as amended through scattered sections of 15 U.S.C. §§ 1331-1341 (1988)) (diversifying label requirements for cigarettes). Section 2 of the Act specifically calls for government dissemination of information concerning the hazards of smoking. 15 U.S.C. § 1331 (1988).

surement.¹⁸¹ If existing regulatory requirements lead to an efficient level of safety for a product, then a risk-utility test in the courts becomes superfluous. In effect, the regulatory analysis supporting these regulations would have already provided the answers to the risk-utility test because they would have shown that the resulting guidelines are efficient.¹⁸²

The way in which one handles the regulatory compliance issue is slightly complicated because not all regulations are equal in terms of their stringency or their intent. For instance, a product that violates an agency's set of regulations, for instance, need not necessarily reflect the appropriateness of the product's safety level. Instead, such a determination may indicate the sparse coverage of the regulations, or it may stem from the agency's inability to establish a specific provision governing the safety characteristics of the product. Therefore, one need not necessarily conclude that the absence of a violation implies that the product is acceptable or passes a risk-utility test. This product simply may have escaped scrutiny by the regulatory agency, and such failure by the agency should not mean that the court must ignore the product.

Another situation where regulatory compliance is not conclusive of safety is that in which a product complies with insufficient government regulations. Such regulations might not be adequate to ensure a level of safety so great that the product would pass a risk-utility test with respect to alternative design changes or warnings.¹⁸³ For example, hazard warnings that are in compliance with the OSHA hazard communication standard may fail to be sufficient because the regulatory agency places very few guidelines upon these

181. See Viscusi, *Product Liability and Regulation: Establishing the Appropriate Institutional Division of Labor*, 78 AM. ECON. REV. 300, 301-03 (1988) (discussing interaction of design and division of labor for regulation of risks).

182. In the case of cigarettes, volumes of analysis have been published regarding the potential risks of cigarettes. See *supra* note 166 (listing various reports published by government agencies regarding hazards of smoking); see also UNITED STATES DEPARTMENT OF HEALTH AND HUMAN SERVICES, *THE HEALTH CONSEQUENCES OF SMOKING: CARDIOVASCULAR DISEASE* (1983) (reporting effects of smoking on heart disease); UNITED STATES DEPARTMENT OF HEALTH AND HUMAN SERVICES, *THE HEALTH CONSEQUENCES OF SMOKING: CANCER — A REPORT OF THE SURGEON GENERAL* (1982) (reporting causal link between cancer and smoking); UNITED STATES DEPARTMENT OF HEALTH AND HUMAN SERVICES, *THE HEALTH CONSEQUENCES OF SMOKING FOR WOMEN — A REPORT OF THE SURGEON GENERAL* (1980) (reporting health effects of smoking on women). For a discussion of congressional preemption of state common law, including risk liability concerning cigarette manufacturers, see Cris & Marjoras, *supra* note 166, at 578-82.

183. See Viscusi, *supra* note 181, at 300-01 (discussing regulatory compliance and liability under tort law); see also Dowie, *Pinto Madness*, in *CRISIS IN AM. INSTITUTIONS* 22 (J. Skolnick & E. Currie 6th ed. 1985) (describing Ford Pinto's compliance with government and corporate regulations and subsequent failure of product to guarantee safety).

warnings.¹⁸⁴ In contrast, hazard warnings for cigarettes contain wording that is mandated by Congress, and all hazard warnings for pharmaceutical products are formally approved by the Food and Drug Administration.¹⁸⁵ In the case of warnings that are explicitly dictated by regulatory actions, the issue should be only whether the producer withheld information from the agency that might have been helpful in formulating a different warning. If this is not the case, the producer should not be liable for any warnings-related risk associated with the product.

A third possible situation is one in which the government regulation creates a standard that goes beyond what would be required by a risk-utility test. This situation occurs when explicit regulations are in compliance with the mandate of the regulatory agency. Moreover, that is possible because the kinds of trade-offs embodied in a risk-utility test are often not permitted under the legislation of the regulatory agency. Congress, for example, has explicitly prohibited OSHA from basing its regulations on benefit-cost grounds, and requires it to follow a risk-oriented approach.¹⁸⁶ The Consumer Product Safety Commission does examine the components related to risk-utility analysis, but does not combine them in any explicit manner or base its decisions entirely upon cost-benefit concepts.¹⁸⁷

In order to reduce the institutional overlaps and avoid giving producers conflicting guidelines for the regulation of their products, an effort should be made to take advantage of the outcomes in the regulatory arena when assessing the desirability of judicial intervention. Ultimately, regulatory agencies, instead of the courts, will exercise authority over most of the major design and warning regulations because these issues hinge on overall market performance, as op-

184. The federal standards regarding hazardous material were first authorized by the Occupational Health and Safety Act of 1970, 29 U.S.C. §§ 651-678 (1982). The Hazard Communication Standard of the Act was promulgated by the Occupational Health and Safety Administration (OSHA) in 1986. See 29 C.F.R. § 1910.1200 (1986); see also Note, *The Extent of OSHA Preemption of State Hazard Reporting Requirements*, 88 COLUM. L. REV. 630, 631-32 (1988) (providing brief description of regulatory system); O'Reilly, *Risk of Assumptions: Impacts of Regulatory Label Warnings Upon Industrial Products Liability*, 37 CATH. U.L. REV. 85, 95-102 (1987) (discussing effects of OSHA regulations on tort system of products liability).

185. See 15 U.S.C. § 1333(a) (1988) (setting out exact wording to be placed on cigarette packages); see also 21 U.S.C. § 353 (1988) (describing requirements for labeling drugs).

186. See *Alternative Approaches*, *supra* note 99, at 6-10 (describing methodology of OSHA regulation promulgation); see also Occupational Health and Safety Act of 1970, 29 U.S.C. § 651 (1976) (setting forth policy "to assure so far as possible every working man and woman in the nation safe and healthy working conditions").

187. See *Alternative Approaches*, *supra* note 99, at 36-55 (discussing methodology, powers, and mandate of Consumer Product Safety Commission). The Consumer Product Safety Commission's mandate is to "protect the public against risks of injury associated with consumer products." Consumer Product Safety Act, § 2(a), Pub. L. No. 92-573, 86 Stat. 1207 (codified as amended at 15 U.S.C. §§ 2051-2083 (1988)).

posed to the idiosyncratic issues that would be involved in a particular case.¹⁸⁸ Whether we reach that stage, however, depends on whether the federal regulatory agencies continue to expand the scope of their efforts. Until such a complete shifting of responsibilities has been achieved, there should at least be greater recognition of the interdependence of these institutions and the commonality of their functions.¹⁸⁹

The nature of the information required to undertake a risk-utility assessment is routinely calculated as part of a regulatory analysis, though it is certainly not the norm in court cases.¹⁹⁰ It is quite common for economists and regulatory agencies to assess consumer demand for a product, the effect on a producer's profits due to a product change, the effect on the purchase price, and the injury costs.¹⁹¹ In situations in which the extent of consumer knowledge is not known, one could perform a sensitivity analysis to reveal how the results of a risk-utility analysis would change. This analysis could use, for example, the extreme situations in which there is no consumer information and full consumer information regarding the risks as points of reference.

In the usual instance, however, one would not attempt to pinpoint each of these magnitudes that comprise a risk-utility calculation.¹⁹² This does not mean the risk-utility standard reduces to serving simply as a "metaphor." Rather, it provides a checklist that the courts can use in framing their analysis about an issue.¹⁹³ In the case of a product design change, for example, the courts must ask whether the improved safety benefits resulting from this change are justified given the added costs.¹⁹⁴ In many cases, simply recognizing the ap-

188. This is assuming, of course, that identical regulations would apply to all products for which the regulations have been promulgated. It would appear that if this is not the case, the courts would be the only forum to deal with individual risk-utility measurements.

189. *But see* R. POSNER, *ECONOMIC ANALYSIS OF LAW* § 23.5 (1972) (claiming neither legal system nor government style of allocation of resources is efficient). It has also been argued that the market is not the most efficient institution to perform these calculations. *See* Viscusi, *supra* note 80, at 74-75 (arguing "markets do not create strong incentives to generate risk information").

190. For an example, see *supra* note 182 (listing reports compiled by Surgeon General on smoking).

191. These are the four factors listed previously as the private risk-utility measure. *See supra* notes 106-10 and accompanying text (describing private risk-utility measure).

192. If this were done, however, we could create a risk-utility/information curve for the passage of the test. This could apply both to the hazard warnings as well as the threshold marketing decision.

193. This checklist would be comprised of a variation of Dean Wade's seven factors, or the private risk-utility measure factors, which includes the firm's profits or the costs to the firm.

194. If the information requirements include hazard warnings on the product, the reduced demand will have an impact on the profits of the firm. *See supra* notes 137-43 and accompanying text (discussing costs of hazard warnings to producers).

appropriate components to assess product liability is most important. In other words, one must ask: What are the criteria that must be used to evaluate liability?

Undertaking formal risk-utility tests, akin to those provided in federal regulatory analyses, may appear to be a daunting task that may pose insurmountable computational burdens. In practice, however, these tests are intended primarily to provide a checklist of the factors that should be considered by the courts. A subjective assessment of the factors or qualitative measures of their importance may be the best that is achievable. Nevertheless, it is useful to have guidelines regarding the set of pertinent concerns and how they should be combined.¹⁹⁵ Moreover, when we recall that the risk-utility test is simply a more elaborate negligence test, then the novelty of the approach is less dramatic than may appear at first glance.¹⁹⁶

CONCLUSION

The risk-utility test developed by Dean Wade has become increasingly prevalent in products liability cases. In large part, the reliance on this test reflects the kind of balancing of consumer and producer interests needed to form any reliable economic judgment regarding the inadequacies of a product. Consideration of safety improvements and hazard warnings require that both producer and consumer impacts be considered under what has been termed the "private risk-utility test."¹⁹⁷ The threshold decision of whether the product should be marketed at all has been highly controversial, but a test along these lines is legitimate if properly formulated.¹⁹⁸ A different risk-utility measure, or what has been termed the purchaser's risk-utility test, is relevant in this instance. A test for the marketability of a product within the context of products liability is also quite appropriate. The general character of the proposed test is that of a negligence standard formalized in precise economic terms. Moreover, the information base used for this test is that at the time the product was sold, thus rejecting the retroactive liability approach of *Beshada*.

195. At the least, the guidelines will provide uniformity across all product defect/hazard warning issues. Although all the components are not appropriate for each case, predictability will be a result because of a standard checklist.

196. See *supra* notes 115-16 and accompanying text (discussing relationship of strict liability to negligence standard).

197. See *supra* notes 106-10 and accompanying text (discussing private risk-utility measure).

198. Thus, the extension of the Wade test in *O'Brien v. Muskin Corp.*, 94 N.J. 169, 183, 463 A.2d 298, 305 (1983) is appropriate. But see *supra* notes 12-13 (arguing *O'Brien* extension is not proper).

Overall, Wade's initial analysis of factors comprising the risk-utility test established a new direction for courts' treatment of product defect cases. Dean Wade's original article enunciated the original basis for risk-utility analysis and outlined many of the considerations that enter, but it did not organize these considerations in any systematic manner. For instance, its benefit and cost concerns are intermingled with specification of alternative types of tests to be undertaken. Subsequent legal scholarship has done little to improve upon this situation, as authors have occasionally suggested other sets of factors to be considered, but did not bring to bear any systematic conceptual framework for approaching the risk-utility judgment in a sound manner. The courts likewise did not advance the conceptualization of risk-utility analysis, although they did extend its domain to include the threshold decision of the marketability of a product.

The original emphasis of risk-utility analysis on the need for balanced decisions with respect to product liability is a correct and fundamental principle. Moreover, many traditional factors that have been considered are legitimate, but they did not provide a framework for comprehensive and consistent risk-utility judgments. The development in this Article of a series of economic formulations of the risk-utility test is intended to establish a sounder basis for a products liability defect doctrine.