

**MARKET SHARE LIABILITY BEYOND DES CASES:
THE SOLUTION TO THE CAUSATION DILEMMA IN LEAD PAINT LITIGATION?**

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I. INTRODUCTION

Lured by success in the tobacco litigation, a handful of plaintiffs' firms now are targeting manufacturers of lead paint and lead pigment, products that played a role in causing childhood lead poisoning.¹ Victims of childhood lead poisoning suing these manufacturers, however, face a seemingly insurmountable obstacle. The law ordinarily requires a plaintiff to identify the specific tortfeasor who caused the harm.² This identification is virtually impossible in the lead paint context. The deteriorated lead paint that caused the harm almost always consists of many layers of paint, applied over a period as long as a century, now buried under additional layers of lead-free paint.³ It is practically impossible, therefore, for a victim to prove which specific manufacturer produced the lead paint, or the lead pigment in the paint, that caused the harm.⁴

Enter "market share liability," a doctrine developed in the 1980s to circumvent the causation problems encountered by plaintiffs in a highly specific type of litigation: lawsuits brought by women suffering from certain cancers against manufacturers of the miscarriage preventative diethylstilbestrol (DES), which the victims' mothers took during pregnancy.⁵ The victims of DES could not causally connect their diseases to the drug produced by any specific manufacturer, so the California Supreme Court, in *Sindell v. Abbott Laboratories*,⁶ pioneered an alternative means of proving cause-in-fact known as market share liability.⁷ This theory presumes that the amount of harm caused by each manufacturer is proportional to its share of the market for DES.⁸ By holding a DES manufacturer liable for its market share proportion of total damages, fairness was achieved.

In DES cases, the products always were chemically identical, as required by the Food and Drug Administration,⁹ and always were consumed in less than a nine-

1. Sandra Torry, *Lead Paint Could Be Next Big Legal Target*, WASH. POST, June 10, 1999, at A1 ("Armed with new legal theories, trial lawyers and politicians locally and across the nation are gearing up to mount a major assault on the former makers of lead paint The potential battle borrows much of its inspiration from the recent legal assault on big tobacco—a confrontation that wrung a \$240 billion settlement from cigarette makers after states took on the industry in a series of lawsuits."). On February 22, 2006, a Rhode Island jury found three manufacturers of lead pigment liable, the first trial court verdict against such manufacturers. Charles Forelle, *Rhode Island Wins Lead-Paint Suit*, WALL ST. J., Feb. 23, 2006, at D7.

2. See *infra* notes 34, 81 and accompanying text.

3. See *infra* notes 32–22 and accompanying text.

4. See *infra* notes 79–84 and accompanying text.

5. See generally *Sindell v. Abbott Labs.*, 607 P.2d 924, 927–28, 936–37 (Cal. 1980) (discussing the problems of proving causation in DES cases and creating the doctrine of market share liability as a remedy); Naomi Sheiner, Comment, *DES and a Proposed Theory of Enterprise Liability*, 46 FORDHAM L. REV. 963, 972–74 (1978) (describing how DES cases presented unique problems with proving "the crucial issue of case-in-fact because most plaintiffs could not 'identify the manufacturer of the drug ingested by their mothers'").

6. 607 P.2d 924 (Cal. 1980).

7. *Id.* at 937.

8. *Id.*

9. *Id.* at 933.

month period. These highly unusual facts allowed courts to determine the market shares of various DES manufacturers at least somewhat accurately.¹⁰ Chemical identity also made it reasonable to assume that the manufacturers' respective market shares reflected the amount of harm each manufacturer caused.¹¹

But what of the possible extension of market share liability to other products that caused latent diseases, but that could not be traced from victim to manufacturer? In the quarter century after *Sindell*, injured victims frequently tried to convince courts to extend market share liability beyond the DES context.¹² With the rarest of exceptions,¹³ such attempts failed because courts found that other products were not "fungible."¹⁴ Fungibility, the notion that certain goods are interchangeable,¹⁵ became the talisman required for market share liability, but fungibility was never really defined, described, or understood by courts.¹⁶ Nor did scholars untangle the meanings of fungibility until Allen Rostron's groundbreaking article in 2004, which advocated a broader variant of market share liability called "proportional share liability."¹⁷

Almost immediately upon the heels of Rostron's article, the Wisconsin Supreme Court, in *Thomas v. Mallett*,¹⁸ adopted Rostron's analytical framework, if not many of his conclusions.¹⁹ The *Thomas* court used Rostron's analysis to

10. See *id.* at 937 ("It is probably impossible, with the passage of time, to determine market share with mathematical exactitude. But . . . the difficulty of apportioning damages among the defendant producers in exact relation to their market share does not seriously militate against the rule we adopt.")

11. See *id.* at 936, 937 (noting that DES was produced from an "identical formula" and holding that it was reasonable "to measure the likelihood that any of the defendants supplied the product which allegedly injured plaintiff by the percentage which the DES sold by each of them . . . bears to the entire production of the drug sold by all").

12. E.g., *George v. Housing Auth. of New Orleans*, 906 So. 2d 1282 (La. Ct. App. 2005) (fire alarms); *McGuinness v. Wakefern Corp.*, 608 A.2d 447 (N.J. Super. Ct. 1991) (lasagna ingredients); *Hamilton v. Beretta U.S.A. Corp.*, 750 N.E.2d 1055 (N.Y. 2001) (handguns).

13. *In re Methyl Tertiary Butyl Ether ("MTBE") Prods. Liab. Litig.*, 175 F. Supp. 2d 593, 621–22 (S.D.N.Y. 2001) (methyl tertiary butyl ether); *Ray v. Cutter Labs.*, 754 F. Supp. 193, 195–96 (M.D. Fla. 1991) (Factor VIII, human plasma product); *Morris v. Parke, Davis & Co.*, 667 F. Supp. 1332, 1348 (C.D. Cal. 1987) (diphtheria-pertussis-tetanus vaccines); *Wheeler v. Raybestos-Manhattan*, 11 Cal. Rptr. 2d 109, 111 (Ct. App. 1992) (asbestos break pads); *Smith v. Cutter Biological, Inc.*, 823 P.2d 717 (Haw. 1991) (Factor VIII); *Russo v. Material Handling Specialties Co.*, No. 9101209, 1995 WL 1146853, at *6 (Mass. Super. Ct. Aug. 29, 1995) (airline beverage carts).

14. E.g., *George*, 906 So. 2d at 1287; *McGuinness*, 608 A.2d at 447; *Hamilton*, 750 N.E.2d at 1067.

15. BLACK'S LAW DICTIONARY 698 (8th ed. 2004).

16. See *infra* Parts III.B, IV.A.1.

17. Allen Rostron, *Beyond Market Share Liability: A Theory of Proportional Share Liability for Nonfungible Products*, 52 UCLA L. REV. 151 (2004).

18. 701 N.W.2d 526, 567 (Wis. 2005).

19. Rostron and the *Thomas* court disagree on the ultimate relevance of fungibility. Rostron initially identifies three ways in which the courts have defined fungibility: (1) functional interchangeability, (2) physical indistinguishability, and (3) uniformity of risk. Rostron, *supra* note 17, at 163–67. Rostron later argues, however, that only the uniformity of risk definition is appropriate for market share liability. *Id.* at 168. More than this, Rostron believes that fungibility is irrelevant under his theory of proportional share liability. *Id.* at 168–69; see *infra* Part IV.A. The *Thomas* court, on the other hand, adopts Rostron's three definitions of fungibility and uses them to hold that lead pigment is

extend Wisconsin's variant of market share liability, known as "risk contribution theory," to actions against lead pigment manufacturers.²⁰ Meanwhile, the Maryland legislature debated a proposal to extend market share liability to lead paint manufacturers.²¹

Market share liability has thus awoken from its long slumber. Will it be the vehicle to circumvent the traditional element of particularized causation, enabling the judiciary to solve the financing issues associated with the lead poisoning epidemic? To answer this question, it is necessary for the first time to determine the appropriate boundaries of market share liability in light of the policies that justify its radical departure from traditional principles of causation.²² This Article undertakes that task. Examining market share liability in the lead paint context is important both as a matter of social policy, given the importance of childhood lead poisoning in our society,²³ and as an arena in which to test and refine the parameters of market share liability.²⁴

Part II begins by reviewing the California Supreme Court's seminal opinion in *Sindell* and extracting from it the policies that undergird market share liability. We then argue that the oft-articulated talisman of fungibility should be viewed more accurately as a proxy for two presumptions that are functional requirements of market share liability: uniformity of risk and the practical impossibility of manufacturer identification. In addition to these requirements, we suggest that the judicial capacity to determine market shares in a meaningful manner is a third requirement of market share liability implicit in *Sindell*.

In Part III, we briefly describe the lead poisoning epidemic and then analyze the reasoning of pre-*Thomas* opinions that refused to extend market share liability to the lead paint context.

Part IV analyzes how both Rostron and the Wisconsin Supreme Court in *Thomas* severed the implicit link between fungibility and chemical identity, thereby allowing the plaintiff in *Thomas* to proceed against lead pigment manufacturers on a risk contribution theory. To do so, the *Thomas* court adopted the three definitions of fungibility that Rostron identifies: (1) functional interchangeability, (2) physical indistinguishability, and (3) uniformity of risk. The Wisconsin Supreme Court ignored Rostron's conclusions that uniformity of risk alone was the key to the application of market share liability and that the other two factors were significant

fungible. *Thomas*, 701 N.W.2d at 560–61. Rostron and the *Thomas* court disagree on a second issue. Rostron recognizes that the lead paint context makes it difficult, if not impracticable, to determine the market shares of various lead paint manufacturers. Rostron, *supra* note 17, at 209. The *Thomas* court, in contrast, acknowledges but does not address the problem of determining market shares, presumably leaving that up to a jury. *See Thomas*, 701 N.W.2d at 562–63.

20. *Thomas*, 701 N.W.2d at 567.

21. *See* H.B. 1394, 2006 Leg., 421st Sess. (Md. 2006), available at <http://mlis.state.md.us/2006rs/bills/hb/hb1394f.pdf> (last visited, Oct. 10, 2006).

22. *See infra* Part II.

23. *See infra* Part III.A.

24. *See infra* Parts IV, V.

only because their presence makes it difficult to trace a particular victim's harm to a specific manufacturer's product.²⁵

In Part V, we survey and analyze the existing jurisprudence on market share liability, excluding DES cases, in light of the three judicial definitions of fungibility identified by Rostron and adopted by the Wisconsin Supreme Court. We conclude that any single definition, standing alone, yields results that are both under- and over-inclusive of the outcomes expected given the foundational presumptions of market share liability. Requiring all three definitions to be met equally is unsatisfactory because it is tantamount to equating fungibility with chemical identity. Finally, we demonstrate how allowing courts to use the three definitions as factors in a balancing test already has yielded dramatically inconsistent results because of the inherent subjectivity of multi-factor tests.

Part VI lays out our alternative formulation of the requirements of market share liability that departs from granting talismanic status to fungibility and corresponds more closely with the policies that justify market share liability in the first place. We propose the application of market share liability be predicated on three requirements:

- (1) Uniform products must pose risk in a uniform manner and to a uniform degree;²⁶
- (2) It must be impossible, as a practical matter, for a victim to trace the harm-causing product back to its specific manufacturer; and
- (3) Courts must be able to ascertain each manufacturer's market share with a reasonable degree of accuracy.

In several regards, these proposed requirements make it easier for victims to employ market share liability than it was under any regime requiring chemical identity. Additionally, it probably will be easier for plaintiffs to satisfy our reformulated requirements than to prevail under *Thomas* if courts understand that case to require plaintiffs to satisfy all three interpretations of fungibility as described by Rostron and the Wisconsin Supreme Court. Our third requirement, forcing courts to focus explicitly on whether it is possible to determine the

25. Rostron, *supra* note 17, at 165.

26. We take no position on Rostron's thesis that even when products do not pose uniform degrees of risk, it may be possible to employ proportionate liability by starting with market share allocations but taking into account the relative degree of risk caused by each product. *See id.* at 174. Certainly as a matter of theory and logic, we find this notion unobjectionable. We do note, however, that the jury's ability to determine each manufacturer's appropriate share of financial liability becomes significantly more complex when it must determine not only the market share but also the relative degree of risk posed by each manufacturer's product. Adding yet another complication to a trial court's analysis that in many instances already seems impossibly complex is not promising. *See generally infra* Part VI.C (discussing the complexities trial courts encounter when trying to calculate each manufacturer's market share).

respective manufacturers' market shares with a meaningful degree of accuracy, is arguably the most crucial requirement but the one largely ignored by courts and commentators until now.²⁷ Most important, our purposive reformulation of the conditions justifying the application of market share liability aligns these requirements with the underlying justifications for the doctrine for the first time.

II. FOUNDATIONAL PREMISES OF MARKET SHARE LIABILITY

A. *Sindell v. Abbott Laboratories*

In *Sindell v. Abbott Laboratories*,²⁸ the California Supreme Court devised market share liability to allow victims of the defective miscarriage preventative diethylstilbestrol (DES) to recover for their injuries.²⁹ From 1947 to 1971, over two hundred drug manufacturers produced DES using an identical formula that was never patented.³⁰ Concomitantly, it was prescribed for millions of expectant mothers.³¹ In 1971, the Food and Drug Administration ordered manufacturers to pull DES from the market after studies showed that daughters whose mothers had consumed the drug had an increased risk of developing vaginal and cervical cancer.³² Shortly thereafter, "DES daughters" across the country filed suit, seeking to hold drug manufacturers liable for their injuries.³³ They could not establish traditional tort liability, however, because they could not identify the specific manufacturer whose drug their mothers took during pregnancy.³⁴ To sidestep the causation problem, the *Sindell* court created a market share theory of liability.³⁵ Under this theory, each manufacturer was liable for damages in proportion to its share of the DES market.³⁶

The *Sindell* court justified the imposition of liability under a relaxed standard of causation for policy reasons familiar in tort law. The court reasoned that "between an innocent plaintiff and negligent defendants, the latter should bear the cost of the injury."³⁷ Additionally, the court believed that drug manufacturers were

27. Rostron is the notable exception to this statement. He concludes that proportional share liability is inappropriate in situations where (1) a significantly "diffuse and varied set of products" causes the harm, (2) the timing of the manufacture and distribution of the product causing plaintiff's harm cannot be determined, or (3) there is no signature injury, and uncertainty about the product that caused the harm as well as concerning the identity of the specific manufacturer. Rostron, *supra* note 17, at 207-11. Each of these factors addresses what we regard as the competency of courts to meaningfully determine market shares.

28. 607 P.2d 924 (Cal. 1980).

29. *Id.* at 937.

30. Sheiner, *supra* note 5, at 963 & n.1, 964 & n.4.

31. *Sindell*, 607 P.2d at 927.

32. *See id.* at 925.

33. *Id.* at 927.

34. *Id.* at 927-28.

35. *Id.* at 936-37.

36. *Id.* at 937.

37. *Id.* at 936 (citing *Summers v. Tice*, 199 P.2d 1, 5 (Cal. 1948)).

in a better position to both absorb the cost of injury and minimize future harm.³⁸ The *Sindell* court concluded:

In our contemporary complex industrialized society, advances in science and technology create *fungible* goods which may harm consumers and which cannot be traced to any specific producer. The response of the courts can be either to adhere rigidly to prior doctrine, denying recovery to those injured by such products, or to fashion remedies to meet these changing needs.³⁹

B. "Fungibility" as a Proxy for Uniformity of Risk and Impossibility of Manufacturer Identification

The *Sindell* court explicitly discussed fungibility when it provided the policy rationale for imposing market share liability, but the court did not refer to fungibility when it explained the mechanics of the theory.⁴⁰ In fact, the California Supreme Court never held that DES was a "fungible good"; rather, the court found it dispositive that DES was produced from an "identical formula."⁴¹ This may or may not merely be a semantic distinction. Is fungibility the same as chemical identity, or are the two concepts separate and distinct? Is chemical identity required for the meaningful application of market share liability, or will some other form of product similarity or relationship suffice? In Part V, we analyze courts' differing interpretations of fungibility. Any such analysis, however, must begin with an understanding of the policies that justify market share liability because these policies circumscribe the boundaries of the theory.

Market share liability was devised to address the injustice that results when manufacturers of uniformly defective products escape liability solely because their products cannot be traced back to them.⁴² The doctrine is based on two foundational presumptions. First, all of the products made by all of the manufacturers must be defective in a uniform way,⁴³ or alternatively, all of the manufacturers must

38. *Id.*; see generally GUIDO CALABRESI, THE COSTS OF ACCIDENTS: A LEGAL AND ECONOMIC ANALYSIS (1970) (describing loss distribution and harm minimization in the law of torts).

39. *Sindell*, 607 P.2d at 936 (emphasis added); see also *Escola v. Coca Cola Bottling Co.*, 150 P.2d 436, 440, 443 (Cal. 1944) (Traynor, J., concurring) (arguing that modern manufacturing trend toward mass production requires strict liability).

40. *Sindell*, 607 P.2d at 936-37; see also *Cummins v. Firestone Tire & Rubber Co.*, 495 A.2d 963, 971-72 (Pa. Super. Ct. 1985) (noting that the *Sindell* court mentioned fungibility in its policy discussion of market share liability).

41. *Sindell*, 607 P.2d at 936.

42. See *id.*; *Collins v. Eli Lilly Co.*, 342 N.W.2d 37, 49 (Wis. 1984) (devising Wisconsin's risk contribution theory because "the interests of justice and fundamental fairness demand" it).

43. See Susan Rose-Ackerman, *Market-Share Allocations in Tort Law: Strengths and Weaknesses*, 19 J. LEGAL STUD. 739, 739 (1990) (noting that a fundamental requirement of market share liability is that "[t]he products supplied by all producers are homogenous with respect to risk"); Rostron, *supra* note 17, at 165 (describing how different manufacturers' DES products posed a uniform risk of harm because they were "'identically defective,' with none being more or less dangerous than the rest"); Sheiner, *supra* note 5, at 994, 1002 (justifying so called "enterprise liability," but holding defendants

otherwise have engaged in uniformly tortious conduct.⁴⁴ Uniformity of defect or of tortious conduct is required because market share liability is justified by the notion that between an innocent plaintiff and *tortious* defendants, the latter should bear the cost of injury.⁴⁵ Furthermore, all of the products must be uniformly defective (defective in the same manner and to the same degree), or all of the manufacturers' conduct must be uniformly tortious, because market share liability apportions damages according to a manufacturer's share of the market.⁴⁶ Such an apportionment presupposes that either each individual product or each manufacturer's conduct poses the same quantum of risk.⁴⁷ Otherwise, a market share apportionment of liability is unfair because it does not approximate the degree to which each manufacturer contributed to the total risk of harm.⁴⁸

The second foundational presumption of market share liability is that the disputed products cannot be traced back to their original manufacturers.⁴⁹ This inability to trace is important because when market share liability is imposed, it is possible—even likely—that a manufacturer will pay damages for injuries that it did not *actually* inflict.⁵⁰ This apparent unfairness is justified by the presumption that an injured victim cannot identify the manufacturer whose tortious conduct, in fact,

liable on a market share basis because DES products are “identically defective”); *see also* *Morris v. Parke, Davis & Co.*, 667 F. Supp. 1332, 1343 (C.D. Cal. 1987) (discussing how market share liability required plaintiffs to show the defective product had “the same defect or combination of defects”); *Sindell*, 607 P.2d at 936 (applying market share liability where the DES manufacturers “produced a drug from an identical formula”); *Hymowitz v. Eli Lilly & Co.*, 539 N.E.2d 1069, 1075 (N.Y. 1989) (finding market share liability appropriate because “the DES situation is a singular case with manufacturers acting in a parallel manner to produce an identical, generically with marketed product”); *Collins*, 342 N.W.2d at 44 (noting that DES was “produced with a chemically identical formula”).

44. *See* *Hamilton v. Accu-Tek*, 62 F. Supp. 2d 802, 829 (E.D.N.Y. 1999), *vacated*, *Hamilton v. Beretta U.S.A. Corp.*, 126 F. Supp. 2d 882 (2d Cir. 2001) (finding that each of the handgun manufacturers had negligently marketed handguns of the same caliber).

45. *Sindell*, 607 P.2d at 936; *Hymowitz*, 539 N.E.2d at 1075; *Collins*, 342 N.W.2d at 49.

46. *Sindell*, 607 P.2d at 937 (Cal. 1980) (apportioning liability based on each defendant's local market share); *Hymowitz*, 539 N.E.2d at 1078 (apportioning liability based on each defendant's national market share). *But see* *Collins*, 342 N.W.2d at 49 (apportioning liability according to a defendant's individual contribution to the total risk of harm). Rostron, as we have noted, would expand “proportional liability” to encompass a broader array of cases in which proof of individualized causation is not possible. *See supra* note 27.

47. *Thomas v. Mallet*, 701 N.W.2d 523, 560-61 (Wis. 2005) (quoting Rostron, *supra* note 17, at 165).

48. *See* Rostron, *supra* note 17, at 165 (arguing that uniformity of risk is “what made market share data the right measure to use to apportion liability”).

49. *See* *Sindell*, 607 P.2d at 936; *Hymowitz*, 539 N.E.2d at 1075; *Collins*, 342 N.W.2d at 49. *But see* *Sindell*, 607 P.2d at 927 (noting that one plaintiff claimed she was able to identify the specific manufacturer of the DES her mother took); *Abel v. Eli Lilly & Co.*, 343 N.W.2d 164, 168 (Mich. 1984) (noting multiple plaintiffs identified specific manufacturers).

50. *See* *Sindell*, 607 P.2d at 937 (“[A] defendant may be held liable for a somewhat different percentage of the damage than its share of the appropriate market would justify.”); *Hymowitz*, 539 N.E.2d at 1074 (“[T]he chance that a particular [defendant] caused the injury is often very remote.”) (citing *Sindell*, 607 P.2d at 931); *Collins*, 342 N.W.2d at 49 (apportioning liability according to each defendant's contribution to the “risk of injury” rather than the actual injuries each caused); Sheiner, *supra* note 5, at 974 (describing how, under market share liability, a plaintiff only has to show there is a “high probability” that one of the defendants caused the injury).

caused her harm. Market share apportionment is thus the best available proxy for cause-in-fact.

Many courts in the past identified goods that were either physically indistinguishable, functionally interchangeable, or both as fungible.⁵¹ These are, in fact, two of the three interpretations of fungibility adopted by the Wisconsin Supreme Court in *Thomas v. Mallet*.⁵² Like Rostron, we conclude that, viewed from the perspective of market share liability, the term fungibility really has only one crucial meaning: uniformity of risk.⁵³ Physical indistinguishability and functional interchangeability, the Wisconsin Supreme Court's other interpretations of fungibility, are critical factors in deciding when market share liability should apply because goods that are physically indistinguishable and functionally interchangeable tend to cause difficult and often impossible identification problems. Accurately speaking, however, these two factors are not aspects of fungibility viewed from the perspective of allocating liability among manufacturers. In our view, fungibility, at least in the context of either market share liability or Rostron's more inclusive proportional liability, should be understood only as describing products that pose uniform risks. In this article, we sometimes use fungibility to describe physical indistinguishability or functional interchangeability when the courts have used the term in those ways. Ultimately, we conclude that the term fungibility has outlived its usefulness as a proxy for the requirements that must be satisfied for market share liability to apply, and we propose purposive rather than definitional boundaries for the appropriate application of market share liability.

C. *Judicial Capacity to Determine Market Shares*

The third foundational presumption of market share liability relates to the capacity of courts to determine each manufacturer's market share with a meaningful degree of accuracy.⁵⁴ This determination is important because a manufacturer's market share is the proxy for the amount of risk its products posed.⁵⁵ In *Sindell*, the judicial determination of market shares was relatively easy.⁵⁶ The victim's mother obviously consumed the DES during an identifiable nine-month interval while she was pregnant, making it feasible to ascertain, in a meaningful way, the market shares of each DES manufacturer during this well-defined and relatively brief period of time.

51. See *infra* Part V.A.1 (functional interchangeability) and Part V.A.2 (physical indistinguishability).

52. 701 N.W.2d at 560.

53. Rostron, *supra* note 17, at 168.

54. See *Sindell*, 607 P.2d at 937 ("It is probably impossible, with the passage of time, to determine market share with mathematical exactitude . . . [But] the difficulty of apportioning damages among the defendant producers in exact relation to their market share does not seriously militate against the rule we adopt.")

55. *Id.*

56. See *id.* (noting that the DES victims identified the five to six manufacturers that produced 90% of the DES market).

III. MARKET SHARE LIABILITY IN LITIGATION AGAINST LEAD PIGMENT MANUFACTURERS

During the first quarter-century following *Sindell*, market share liability, for all intents and purposes, was limited to DES cases.⁵⁷ Slightly more than one-third of all states addressing the issue since *Sindell* have adopted or indicated they might adopt market share liability where products are fungible.⁵⁸ Plaintiffs' attorneys frequently attempted to persuade courts to use market share liability in other contexts,⁵⁹ but outside the DES context, courts applied the doctrine in merely a handful of them.⁶⁰ Initially, litigation against manufacturers of lead pigment was no exception.⁶¹

A. Childhood Lead Poisoning

Approximately 310,000 American children under six years of age have elevated blood lead levels in a range that poses a variety of health risks.⁶² The major source of lead exposure among these children is lead paint and the dust generated when lead paint deteriorates.⁶³ Exposure to poorly maintained and deteriorated lead paint can cause young children to develop various health problems, including impaired cognitive function and hearing, behavioral difficulties, reduced stature,

57. Rostron, *supra* note 17, at 153; Aaron D. Twerski, *Market Share—A Tale of Two Centuries*, 55 BROOK. L. REV. 869, 875 (1989); Andrew B. Nance, Note, *Market Share Liability: A Current Assessment of a Decade-Old Doctrine*, 44 VAND. L. REV. 395, 397 (1991).

58. Rostron, *supra* note 17 at 170 n.103.

59. See *supra* note 12.

60. See *supra* note 13.

61. *City of Philadelphia v. Lead Indus. Ass'n*, 994 F.2d 112, 129 (3rd Cir. 1993) (“We hold that none of the theories advocated by plaintiffs—market share liability, alternative liability or enterprise liability—may be invoked to impose liability on the lead pigment industry for the costs of lead-based paint abatement.”); see also *Santiago v. Sherwin Williams Co.*, 3 F.3d 546, 552 (1st Cir. 1993) (dismissing the plaintiff's cause of action against lead paint manufacturers because “plaintiff's market share and concert of action claims fail as a matter of law”); *Jefferson v. Lead Indus. Ass'n*, 930 F. Supp. 241, 247 (E.D. La. 1996), *aff'd*, 106 F.3d 1245 (5th Cir. 1997) (dismissing plaintiff's complaint and refusing to adopt market share liability); *Brenner v. Am. Cyanamid Co.*, 699 N.Y.S.2d 848, 854 (N.Y. App. Div. 1999) (holding market share liability was inapplicable against lead paint manufacturers); *Skipworth v. Lead Indus. Ass'n*, 690 A.2d 169, 173 (Pa. 1997) (declining to apply market share liability in lead paint cases because to do so “would grotesquely distort liability” and make the determination of culpability unfair). But see *Jackson v. Glidden Co.*, 647 N.E.2d 879, 884 (Ohio Ct. App. 1995) (reversing dismissal of the market share liability claim because the plaintiff's sufficiently “alleged that lead paint and lead paint products are completely fungible, and that a substantial share of the lead paint producers in the state are present in the suit”).

62. NAT'L CTR. FOR ENVTL. HEALTH, CTRS. FOR DISEASE CONTROL & PREVENTION, DEP'T OF HEALTH & HUMAN SERVS., CHILDHOOD LEAD POISONING (2005), <http://www.cdc.gov/nceh/publications/factsheets/ChildhoodLeadPoisoning.pdf>.

63. *Id.* Other sources include home health remedies such as arzacon and greta, some candies imported from Mexico, imported toy jewelry, drinking water from pipes and pipe fixtures containing lead, a parent's occupational exposure, and family members' hobbies that include working with lead. *Id.*

and, in extreme but now rare cases, death.⁶⁴ Federal law, however, has prohibited the use of lead paint in the interior of residences since 1978.⁶⁵ Furthermore, in 1955 the paint industry voluntarily agreed to limit the lead content in paint to no more than 1% in total weight.⁶⁶ More than 80% of the lead still remaining in residential housing today was applied before 1940, and less than 4% was applied after 1960.⁶⁷ Most cases of childhood lead poisoning arise in a small percentage of poorly maintained residential properties.⁶⁸ Children from low-income families, often children of color, are disproportionately affected by lead poisoning.⁶⁹

Residential property owners, states and municipalities, and the federal government incur substantial costs in preventing and treating childhood lead poisoning. More than 19 million housing units occupied in the United States in 1997 were constructed prior to 1940, most of which contain lead paint.⁷⁰ Another 44 million units occupied in 1997 were built between 1940 and 1974, many of which also contain lead paint.⁷¹ The estimated cost of screening these pre-1960 units and implementing so-called "interim controls" that dramatically reduce the likelihood of childhood lead poisoning is \$1,000 per unit, and the cost of total abatement or removal of lead paint is \$9,000 per unit.⁷² Even applying the modest interim control measures only to those most dangerous properties constructed before 1940 yields an astronomical figure of more than \$19 billion. This figure only includes primary prevention costs and does not account for the costs of treating already-existing victims, compensating victims for their personal damages (including lost income), and educating the public about the dangers of childhood

64. See PRESIDENT'S TASK FORCE ON ENVTL. HEALTH RISKS & SAFETY RISKS TO CHILDREN, ELIMINATING CHILDHOOD LEAD POISONING: A FEDERAL STRATEGY TARGETING LEAD PAINT HAZARDS 1-2 (2000) [hereinafter PRESIDENT'S TASK FORCE].

65. See 16 C.F.R. §§ 1303.1(a)-(b), 1303.4(a) (2006) (banning "lead-containing paint" from consumer use as a hazardous product) (originally promulgated at 42 Fed. Reg. 44,199 (Sept. 1, 1977)); see also Lead-Based Paint Poisoning Prevention Act, Pub. L. No. 91-695, § 401, 84 Stat. 2078, 2079 (1971) (codified as amended at 42 U.S.C. § 4831 (2000)) (banning lead paint in federally-funded programs).

66. AM. STANDARDS ASS'N, AMERICAN STANDARD SPECIFICATIONS TO MINIMIZE HAZARDS TO CHILDREN FROM RESIDUAL SURFACE COATING MATERIALS 5 (1955) [hereinafter AM. STANDARD SPECIFICATIONS] (Standard Z66.1-1955 § 2(a)) (listing members of the National Paint, Varnish, and Lacquer Association as participants on the American Standards Association Committee on Hazards to Children, which developed the specifications limiting lead content).

67. PRESIDENT'S TASK FORCE, *supra* note 64, at 22 tbl.4.

68. See, e.g., Christy Darlene Plumer, Setting Priorities for Prevention of Childhood Lead Poisoning in Providence 20 (May 2000) (unpublished M.A. thesis, Brown University) (on file with Center for Environmental Studies, Brown University) ("[A]pproximately 60% of the poisoning events occurred in approximately 2.5% (mean of the adjusted and unadjusted address figures) of [Providence, Rhode Island's] residential properties.")

69. PRESIDENT'S TASK FORCE, *supra* note 64, at 2 (reporting that "low-income and minority children are much more likely to be exposed to lead hazards," and "16% of low-income children living in older housing are poisoned, compared to 4.4% of all children").

70. *Id.* at app. A-10, tbl.11.

71. *Id.*

72. *Id.* at app. A-28, tbl.2. Both of these figures are quite conservative. Advocates for property owners and many in the lead abatement business would argue that these figures are artificially low.

lead poisoning. As a sad measure of the political will to address the problem, in 2000, a presidential task force recommended a federal budget of \$164.5 million to prevent childhood lead poisoning in 2001; however, the task force's recommendations have been largely ignored.⁷³

Costs of this magnitude have spurred individual victims, as well as states and municipalities, to pursue legal actions against any private party that conceivably might be held liable.⁷⁴ For the individual victim of childhood lead poisoning, one obvious target is the landlord whose negligence in allowing lead paint to deteriorate was a proximate cause of the child's poisoning.⁷⁵ Sometimes, however, the landlord is judgment proof. In other circumstances, a landlord may be shielded from liability because some state statutes grant them immunity from common law liability after they complete specified lead-hazard reduction treatments.⁷⁶ Finally, pollution-exclusion provisions in a landlord's liability insurance contract may preclude coverage and prevent the victim from recovering from the landlord's insurer.⁷⁷ In *Thomas v. Mallett*, the Wisconsin Supreme Court cited the victim's inability to receive adequate compensation from the landlord or the landlord's insurer as a reason for allowing the victim to proceed against lead pigment manufacturers.⁷⁸ Recently, Rhode Island⁷⁹ and a number of municipalities⁸⁰ also sued manufacturers of lead paint or lead pigment in an attempt to recover the costs of preventing childhood lead poisoning.

73. *Id.* at 9 (allocating approximately \$120 million of the \$164.5 million estimated budget for primary prevention of lead hazards in residences). See generally OFFICE OF MGMT. & BUDGET, EXECUTIVE OFFICE OF THE PRESIDENT, HISTORICAL TABLES, BUDGET OF THE UNITED STATES GOVERNMENT, FISCAL YEAR 2003, at 265 tbl.12.3 (2002) (showing \$86 million allocation in federal budget for "[l]ead housing reduction" in 2001).

74. See *supra* note 1 (discussing the nationwide surge of actions against former manufacturers of lead paint beginning in 1999).

75. E.g., *Brooks v. Lewin Realty III, Inc.*, 835 A.2d 616, 627 (Md. 2003) (holding the landlord liable for the plaintiff's injuries from lead poisoning due to "the presence of flaking, loose, or peeling paint" in violation of the Baltimore City Housing Code); *Brown v. Dermer*, 744 A.2d 47, 60-61 (Md. 2000) (holding the defendant landlord liable for the plaintiff's injuries due to "flaking paint that was lead-based"); see also *Ohio Jury Awards \$100,000 to Lead-Poisoned Boy*, MEALEY'S LITIG. REP.: LEAD, Aug. 13, 2003, at 11 (allowing plaintiff to recover from landlord for injuries caused by toxic lead levels in rental property created by deteriorating lead paint and dust); *\$2M Verdict for Virginia Girl*, MEALEY'S LITIG. REP.: LEAD, Apr. 16, 2003, at 4 (allowing a plaintiff to recover from a landlord for lead poisoning caused by the negligence of the landlord's contractor).

76. E.g., WIS. STAT. § 254.173(2) (Supp. 2005) (granting immunity if, at the time the lead exposure occurred, the dwelling was certified as lead free or lead safe); see also *Thomas v. Mallett*, 701 N.W.2d 523, 553 & n.34 (Wis. 2005) (applying statute).

77. *Thomas*, 701 N.W.2d at 552-53.

78. *Id.* For more detail regarding the *Thomas* court's decision to allow a plaintiff to recover under Wisconsin's risk contribution theory, see *infra* Part IV.B.

79. In February 2006, a Rhode Island jury held lead pigment manufacturers liable to the State of Rhode Island for potentially billions of dollars. Forelle, *supra* note 1, at D7.

80. See, e.g., *County of Santa Clara v. Atlantic Richfield Co.*, 40 Cal. Rptr. 3d 313, 320, 348 (Ct. App. 2006) (reversing trial court's dismissal of county's class action against several lead manufacturers); *City of Milwaukee v. NL Indus., Inc.*, 691 N.W.2d 888, 890, 897 (Wis. Ct. App. 2004) (reversing the trial court's dismissal of the city's claims of public nuisance, conspiracy, and restitution against lead paint manufacturers), *petition for review dismissed*, 703 N.W.2d 380 (Wis. 2005).

B. Fungibility as Chemical Identity: Dismissal of Claims Because of Inability to Prove Identity of Manufacturer

When victims of childhood lead poisoning sue manufacturers of lead paint or lead pigment, they usually are unable to identify the specific manufacturer that produced the harm-causing product.⁸¹ It is not difficult to see why, as the facts in *Skipworth v. Lead Industries Ass'n* illustrate. In *Skipworth*, the guardians of a child suffering from lead poisoning sued “substantially all of the manufacturers of lead pigment,” the presumed toxic ingredient in the paint applied to the child’s house.⁸² The court emphasized the victim’s inability to “identify any application, or applications, of lead paint” that caused the child’s health problems.⁸³ Instead they identified the period from the home’s construction in 1870 to the time lead paint was no longer available for residential use in 1977 as the relevant time frame.⁸⁴ No records were available to determine when the house had been painted, which paint manufacturers’ products were used, or which pigment manufacturers’ products were contained in any given paint.⁸⁵ Additionally, none of the products had a chemical signature that could identify any particular manufacturer’s paint or pigment.⁸⁶

Similarly situated plaintiffs have unsuccessfully attempted to hold manufacturers of lead paint or lead pigment liable under market share liability,⁸⁷ with the notable exception of the plaintiff in *Thomas*.⁸⁸ The judicial rejection of market share liability in these cases naturally flows from the policies behind the theory.⁸⁹ As we described above, market share liability presupposes that the disputed products pose a uniform risk.⁹⁰ According to the court in *Brenner v. American Cyanamid Co.*,⁹¹ this factor is not met in the lead paint context:

All DES manufactured had an identical chemical composition. In contrast, lead-based paint is not a fungible product; it contains

81. See, e.g., *Brenner v. Am. Cyanamid Co.*, 732 N.Y.S.2d 799, 800 (App. Div. 2001) (“[P]laintiffs admitted that they could not identify which defendant had manufactured the lead pigment found in their residence.”); *Skipworth v. Lead Indus. Ass’n*, 690 A.2d 169, 171 (Pa. 1997) (“Appellants stipulated that they could not identify the manufacturer of the lead pigment which [the plaintiff] ingested, and admitted that they could not identify when such pigment was made, sold, or applied to her home.”).

82. *Skipworth*, 690 A.2d at 171.

83. *Id.* at 172–73.

84. *Id.*

85. See *id.* at 171–73.

86. *Id.* at 173.

87. See *supra* note 61 (listing numerous cases in which courts have held market share liability inapplicable in lead paint and pigment cases).

88. *Thomas v. Mallett*, 701 N.W.2d 523, 562 (Wis. 2005).

89. See *supra* Part II.B.–C. (analyzing the three foundational presumptions underlying the doctrine of market share liability).

90. See *supra* notes 42–48 and accompanying text (discussing that the products at issue must pose a uniform risk if market share liability is to yield equitable results).

91. 699 N.Y.S.2d 848 (App. Div. 1999).

varying amounts of lead pigments, including white lead carbonate. Arguably, the white lead carbonate used as a raw material in some lead-based paint did not differ between manufacturers. However, paint manufacturers used differing amounts of white lead carbonate, or some other lead pigment, in their paints. Some lead-based paint contained 10% lead pigment, while other paint was more toxic, containing as much as 50% lead pigment. Not only did the amount of lead pigment vary, but so did the type of lead pigment used.⁹²

The *Skipworth* court found that the lead pigment was the harm-causing product, not the paint containing it.⁹³ However, the court found the different compositions of the product ultimately consumed—lead paint—affected the quantum of risk posed by equivalent amounts of chemically identical lead pigment:

In contrast, it is undisputed that lead pigments had different chemical formulations, contained different amounts of lead, and differed in potential toxicity.

Appellants contend that “whether all of the lead pigment [the pigment manufacturers] manufactured was exactly the same, in every respect, [is] irrelevant” We do not see this problem being so easily dismissed. Uncontested evidence shows that differing formulae of lead paint result in differing levels of bioavailability of the lead. Because of differences in bioavailability, a child who ingests dust or chips of lead paint containing equal amounts of lead “derived from two lead paints will not generally develop equal elevation in internal lead level from the two paints. Rather, more highly bioavailable lead has a greater impact than lead in less bioavailable form.” Thus, differing formulae of lead paint has a direct bearing on how much damage a lead paint manufacturer’s product would cause.⁹⁴

The other requirement for the principled application of market share liability is the ability of a court to determine the respective market shares of various manufacturers, if not with absolute accuracy, then at least with a meaningful approximation.⁹⁵ Until *Thomas*, this requirement alone doomed the application of

92. *Id.* at 853.

93. 690 A.2d 169, 173 (Pa. 1997).

94. *Id.* (footnote and citations omitted); accord *Brenner*, 699 N.Y.S.2d at 853 (determining the various lead paints did not pose the same quantum of risk based on different paints containing “varying amounts of lead pigments”).

95. See *supra* Part II.C. (addressing the capacity of courts to accurately determine the respective market shares of DES manufacturers); see also *infra* Part VI.C. (discussing the inability of courts to accurately determine respective market shares of lead paint or lead pigment manufacturers).

market share liability in cases against manufacturers of lead paint or lead pigment.⁹⁶ Why is it impossible, as a practical matter, to determine market shares with a reasonable degree of accuracy in the lead paint context? First, as the *Skipworth* court noted, the paint that caused the harm may have been applied at any point during “a more than one hundred year period from the date the house was built until the lead paint ceased being sold for residential purposes.”⁹⁷ It is one thing to determine the manufacturers’ respective market shares during a nine month period, as in the DES context, but it is a far different proposition to determine market shares during a period in excess of a century. Manufacturers of lead paint and lead pigment entered the market, exited the market, re-entered, and perhaps re-exited the market during this period.⁹⁸ Second, courts declining to apply market share liability in the lead paint context have found that determining market shares of manufacturers within any given period that occurred as long as 130 years ago may be unrealistic, regardless of the duration of the period during which the products were manufactured.⁹⁹ Neither plaintiffs nor defendants possess the necessary records to determine the market shares of lead paint or lead pigment manufacturers in 1880, 1900, or 1920.

IV. MARKET SHARE LIABILITY SHATTERS THE BARRIER OF CHEMICAL IDENTITY

At the dawn of the twenty-first century—a generation after *Sindell*—market share liability remained a theory constrained by a narrow definition of fungibility equated with chemical identity and largely limited to the DES context. The equities in favor of plaintiffs, however, often are compelling. In the case of latent diseases that arise years, even decades, after a victim is exposed to a product, it usually is impossible for a victim to identify the manufacturer whose product caused the harm. The court may find that the defendants acted tortiously when manufacturing their products and the victim suffered from a harm caused by *some* manufacturer’s product. Still, unless the victim shows chemical identity among the products of various manufacturers,¹⁰⁰ courts usually refuse to apply market share liability.¹⁰¹

96. See, e.g., *Skipworth*, 690 A.2d at 173 (recognizing “[t]he difficulty in applying market share liability where such an expansive relevant time period as one hundred years is at issue”).

97. *Id.*

98. See *id.*; accord *Brenner v. Cyanamid Co.*, 699 N.Y.S.2d 848, 852–53 (App. Div. 1999) (concluding the court could not accurately determine each defendant’s average market share for the twenty-nine year period because “[d]uring that extended time period, some of the defendants entered and left the white lead carbonate market”).

99. See *Santiago v. Sherwin Williams Co.*, 3 F.3d 546, 551 (1st Cir. 1993); *Jefferson v. Lead Indus. Ass’n*, 930 F. Supp. 241, 247 (E.D. La. 1996), *aff’d*, 106 F.3d 1245 (5th Cir. 1997) (citing *Santiago*, 3 F.3d at 550–52); *Brenner*, 699 N.Y.S.2d at 852–53; *Skipworth*, 690 A.2d at 173.

100. See generally *Morris v. Parke, Davis & Co.*, 667 F. Supp. 1332, 1341 (C.D. Cal. 1987) (addressing the chemical similarities of diphtheria-pertussis-tetanus vaccines); *In re MTBE Prods. Liab. Litig.*, 75 F. Supp. 2d 593, 621 (S.D.N.Y. 2001) (discussing plaintiffs’ allegations that MTBE “lack[ed] characteristics or a chemical signature” that would enable identification of the refinery or company that manufactured the product); *Wheeler v. Raybestos-Manhattan*, 11 Cal. Rptr. 2d 109, 111 (Ct. App. 1992) (discussing the compositional similarity of asbestos break pads); *Smith v. Cutter Biological, Inc.*, 823 P.2d 717, 724 (Haw. 1991) (analyzing whether the human blood plasma product Factor VIII was

Not even the compelling health crisis resulting from childhood lead poisoning loosened the generally prohibitive prerequisites of market share liability.¹⁰² Then, beginning in 2004, scholars, courts, and legislatures reassessed market share liability, a doctrine that had calcified during the previous generation.

A. *Proportional Share Liability for Nonfungible Products*

In 2004, Allen Rostron published an article¹⁰³ that, even after only two years, can convincingly be characterized as influential, if for no other reason than its impact on the Wisconsin Supreme Court.¹⁰⁴ The court relied upon Rostron's analytical framework in its seminal decision in *Thomas v. Mallett*, which extended Wisconsin's variant of market share liability, known as "risk contribution theory," to litigation against lead pigment manufacturers.¹⁰⁵ Rostron criticized courts for "turn[ing] fungibility into an instrument that can bar use of market share liability in virtually any case."¹⁰⁶ In its place, he proposed an alternative he labeled "proportional share liability."¹⁰⁷ Under proportional share liability, courts might begin with market share liability but then use "other available information to make a reasonable allocation of liability that fairly reflects each defendant's contribution to the risk and likelihood of having caused the harm."¹⁰⁸ In the lead paint context, for example, courts could use data showing the relative proportions of lead in each manufacturer's paint to adjust their market share calculations to accurately reflect the risk each manufacturer posed.¹⁰⁹ Lead content thus becomes the multiplier in a weighted average formula.

1. *Rostron's Analysis of Fungibility*

What is most pertinent for our purposes is Rostron's untangling of the varying ways in which courts have understood "fungibility" in the past. He categorizes three such interpretations: (1) functional interchangeability, (2) physical

fungible based on compositional similarity).

101. See, e.g., *Setliff v. E.I. DuPont de Nemours & Co.*, 38 Cal. Rptr. 2d 763, 769-70 (Ct. App. 1995) (dismissing plaintiff's action against the manufacturers of industrial adhesives and solvents because plaintiff did not identify a fungible agent common to all of the products); *Bly v. Tri-Continental Indus., Inc.*, 663 A.2d 1232, 1244 (D.C. 1995) (declining to apply market share liability to benzene gasoline because the "record reveals that the formula can vary for the numerous sources of gasoline products"); *Skipworth*, 690 A.2d at 173 (finding the variations of the amount and type of lead pigment in the lead paints undermined the plaintiff's market share liability claim).

102. See *supra* note 61.

103. Rostron, *supra* note 17, at 151.

104. *Thomas v. Mallett*, 701 N.W.2d 523 *passim* (Wis. 2005).

105. *Id.* at 567.

106. Rostron, *supra* note 17, at 153.

107. *Id.* at 154.

108. *Id.*

109. See *infra* notes 114-22 and accompanying text (discussing Rostron's theoretical applications of proportionate liability to nonfungible products).

indistinguishability, and (3) uniformity of risk.¹¹⁰ Rostron traces functional interchangeability directly to the explicit language of *Sindell v. Abbott Laboratories*,¹¹¹ which described DES as a “drug interchangeable with other brands of the same product.”¹¹² Rostron’s second understanding of fungibility, physical indistinguishability, results from the identical or similar physical characteristics of the products of various manufacturers, which make it difficult or impossible for consumers or courts to tell them apart.¹¹³

As Rostron correctly suggests, these first two definitions of fungibility are actually second-order factors that determine whether “a product may pose unusually severe identification problems.”¹¹⁴ In other words, a purposive restatement of a single requirement for market share liability combining both functional interchangeability and physical indistinguishability would be whether it is impossible, as a practical matter, for a victim to trace the product causing his harm back to its specific manufacturer.

Rostron regards the third definition of fungibility, uniformity of risk, as the key to “traditional” market share liability, in contrast with his more flexible proportional share liability.¹¹⁵ After all, apportioning liability among the manufacturers according to their unadjusted market shares is fair only if each product poses a uniform risk of harm.¹¹⁶

2. *Rostron and Judicial Competency*

The draft *Restatement (Third) of Torts* analyzes a theory it calls “risk-adjusted market-share liability,”¹¹⁷ which envisions something similar to Rostron’s proportional share liability. The *Restatement* concludes that “[w]hile in theory a risk-adjusted market-share liability system might be attractive, the administrative costs imposed even by a pure-market-share system augur against such efforts, and there is virtually no case support for a risk-adjusted market-share theory.”¹¹⁸ Rostron is highly critical of the *Restatement*’s reluctance to embrace risk-adjusted market share liability.¹¹⁹ He uses five examples to illustrate how the differences in risk between non-quantifiable products can be quantified, thus making risk-adjusted market share liability—proportional share liability—feasible.

Rostron first describes how risk-adjusted market share liability can apply to cases involving defective vaccines for diphtheria-pertussis-tetanus (DPT)¹²⁰ because

110. Rostron, *supra* note 17, at 163–67.

111. 607 P.2d 924 (Cal. 1980).

112. *Id.* at 926.

113. *See* Rostron, *supra* note 17, at 164–65 (discussing physical indistinguishability in the DES context).

114. *Id.*

115. *Id.* at 165, 169.

116. *See supra* notes 40–46 and accompanying text.

117. RESTATEMENT (THIRD) OF TORTS § 28(b) cmt. o (Proposed Final Draft No. 1, 2005).

118. *Id.*

119. Rostron, *supra* note 17, at 173.

120. *Id.* at 174–80.

the vaccine manufacturers record the incidence of injuries resulting from their products.¹²¹ A similar risk-adjustment is possible in cases involving asbestos brake pads because the amount of asbestos in each pad can be quantified.¹²² In the handgun context, adjusting for risk is a little trickier, but still possible. The federal government's annual tracing of hundreds of thousands of guns used in crimes provides a basis to allocate liability among gun manufacturers even when the manufacturer of a gun used in a particular crime cannot be traced.¹²³ Rostron's fourth example is orbital space debris, which may collide with operational spacecraft.¹²⁴ United States and Russian space surveillance systems can identify the nations responsible for the largest pieces of debris;¹²⁵ the United States, for example, produced just over 50% of total space debris in 1997.¹²⁶ Thus, a court could apportion damages resulting from unidentified debris based on a nation's share of identifiable debris.¹²⁷ Lastly, in tobacco litigation, market share liability can be risk adjusted because the government uses a uniform standard to measure the amount of tar, nicotine, and carbon monoxide for almost every cigarette brand in the United States.¹²⁸

Each of Rostron's examples, however, begins with meaningful market share data that then can be adjusted to account for varying levels of risks. Most of his examples involve products that were marketed (and in one case, launched) relatively recently: vaccines, handguns, and space debris. However, none of these examples mirror the complexity of determining the appropriate portions of liability for nonfungible products that were produced and distributed decades ago but that have caused latent diseases only recently. Rostron acknowledges the importance of an identifiable time frame:

Plaintiffs seeking to recover on a theory of proportional share liability also will continue to face significant and often insurmountable hurdles if they cannot determine the approximate time that the tortious conduct occurred. Although often overlooked, one of the characteristics that made DES a particularly appealing candidate for market share liability is that it was relatively easy to determine the approximate time of manufacture of the DES that caused each plaintiff's injuries.¹²⁹

121. *Shackil v. Lederle Labs.*, 530 A.2d 1287, 1293–94 (N.J. Super. Ct. App. Div. 1987).

122. *Wheeler v. Raybestos-Manhattan*, 11 Cal. Rptr. 2d 109, 111 (Ct. App. 1992); *see also* Rostron, *supra* note 17, at 181–82 (discussing *Wheeler* court's reasoning).

123. Rostron, *supra* note 17, at 185–86.

124. *Id.* at 200–02.

125. *Id.* at 200. *See generally* Mark J. Sundahl, Note, *Unidentified Orbital Debris: The Case for a Market-Share Liability Regime*, 24 HASTINGS INT'L & COMP. L. REV. 125, 132–33 (2000) (discussing how the United States and Russia have tracked space debris since 1957).

126. *See* Sundahl, *supra* note 125, at 146.

127. *Id.* at 145–46.

128. Rostron, *supra* note 17, at 203–05.

129. *Id.* at 208.

Ironically, given how the Wisconsin Supreme Court later used his analysis in *Thomas v. Mallet*,¹³⁰ Rostron explicitly rejects the application of proportional share liability to cases against lead pigment manufacturers:

The timing of the tortious conduct is much more difficult to determine for some other products and, as a result, proportional share liability is much more difficult to apply. For example, the First Circuit rejected market share liability claims against the makers of lead paint pigments in *Santiago v. Sherwin Williams Co.* on the ground that plaintiff could not identify the time of the tortious conduct with sufficient specificity to allow a reasonable allocation of liability to be made. . . .

Recognizing that proportional share liability can be applied to nonfungible products using information other than just market share data would not necessarily help plaintiffs unable to determine the timing of tortious conduct. For example, a willingness to adjust market share data upward and downward to account for variations in the lead content of different types of paint will not change the fact that a plaintiff does not know the time of the paint's manufacture and sale and therefore cannot identify the approximate year or even decade from which to draw the market share data in the first place.¹³¹

B. Risk Contribution Theory and Childhood Lead Poisoning

The Wisconsin Supreme Court's opinion in *Thomas v. Mallett*¹³² broke new ground in 2005 when it applied a variant of market share liability, which it called "risk contribution theory," in essentially the same factual context that was present in *Skipworth*.¹³³ The *Thomas* court allowed a victim of childhood lead poisoning to proceed to trial against lead pigment manufacturers, even though the victim could not identify the specific manufacturers that caused the harm.¹³⁴ *Thomas* blazes new ground in tort causation by dramatically expanding the boundaries of market share liability beyond DES cases. *Thomas* also extended the theory, for the first time, to the rapidly emerging and socially important litigation against manufacturers of lead

130. See *supra* Part IV.A.1.

131. Rostron, *supra* note 17, at 209 (footnotes omitted).

132. 701 N.W.2d 523 (Wis. 2005).

133. *Id.* at 567.

134. As would be expected, the *Thomas* court justified its adoption of a market share-like approach on instrumental grounds, primarily loss distribution. It recognized that, compared to the plaintiff, the defendant-manufacturers were "in a better position to absorb the cost of the injury." *Id.* at 558. The court went on to explain that manufacturers "can insure themselves against liability, absorb the damage award, or pass the cost along to the consuming public as a cost of doing business." *Id.* The court also relied on both a loss-minimization rationale, i.e., "deterring knowingly wrongful conduct that causes harm," and corrective justice principles. *Id.* at 558 & n.44.

paint and lead pigment. Two aspects of the court's analysis facilitated the application of a variant of market share liability to the lead paint context.

1. *The Thomas Court Fudges Fungibility*

Explicitly citing to and building upon Rostron's analysis, the *Thomas* court eliminated any requirement of chemical identity among the various manufacturers' products.¹³⁵ Indeed, the Wisconsin Supreme Court expressly held that "chemical identity is not required" to establish the fungibility necessary for the risk contribution theory to apply.¹³⁶

"Fungibility," the *Thomas* court further observed, "is not a term that is capable of being defined with categorical precision."¹³⁷ Consequently, the court required some unspecified combination of Rostron's three previously identified definitions: whether the disputed products were (1) functionally interchangeable,¹³⁸ (2) physically indistinguishable,¹³⁹ or (3) "identically defective."¹⁴⁰ The *Thomas* court failed to note that Rostron ultimately concluded that neither functional interchangeability nor physical indistinguishability is necessary for market share liability.¹⁴¹ The court also did not explain whether a plaintiff invoking risk contribution theory must meet all three definitions or whether the satisfaction of a single interpretation suffices. Nor did the *Thomas* court provide any guidance for how a court should weigh the multiple factors. Ultimately, the court implied that whether a product is fungible is an issue of fact that should be left to a jury.¹⁴²

2. *Risk Contribution: An Even More Impossible Judicial Task*

It is ironic that the Wisconsin Supreme Court extended its risk contribution theory beyond DES cases given its reason for rejecting the "traditional" market share liability pioneered in *Sindell* in favor of its own risk contribution theory, a

135. *Id.* at 560.

136. *Thomas v. Mallett*, 701 N.W. 2d 523, 560 (Wis. 2005).

137. *Id.* at 561; *see also* Rostron, *supra* note 17, at 168 (arguing for an understanding of fungibility depending on "uniformity of risk").

138. For example, according to the *Thomas* court, various chemical compounds of white lead carbonate, though not chemically identical, are functionally interchangeable because they were "lead pigments . . . [that] provided the hiding power of paint." *Thomas*, 701 N.W.2d at 561. The court reached this conclusion despite having noted that a wide variety of functionally interchangeable paint pigments existed that did not contain lead, including "lithopone, titanium dioxide, latex, water-based and alkyd resin." *Id.* at 535 n.13.

139. Physical indistinguishability "is significant because it is . . . a reason why a product may pose identification problems." *Id.* at 560.

140. Here the court opined that the lack of an identical chemical formula does not mean that each manufacturer's product does not pose the same amount of risk as another manufacturer's product. *Id.* at 560-61. The court emphasized that "it is the common denominator . . . that matters." *Id.* at 562.

141. Rostron, *supra* note 17, at 168.

142. *Thomas*, 701 N.W.2d at 560 n.47. In declining to decide whether lead pigment is a fungible product, the court stated, "We do not resolve factual disputes." *Id.*

variant of market share liability. In 1984, in *Collins v. Eli Lilly Co.*,¹⁴³ the Wisconsin Supreme Court declined to adopt market share liability in the DES context because it recognized the difficulty of determining even reasonable approximations of each DES manufacturer's market share:

The primary factor which prevents us from following *Sindell* is the practical difficulty of defining and proving market share. . . . There are several reasons for this: The DES market apparently was quite fluid, with companies entering and leaving the market over the years; some companies no longer exist and some that still exist may not have relevant records; and apparently there are no accurate nationwide records pertaining to the overall production and marketing of DES. We view defining the market and apportioning market share as a near impossible task if it is to be done fairly and accurately in order to approximate the probability that a defendant caused the plaintiff's injuries.¹⁴⁴

Concerned with the practical impossibility of determining market shares in any meaningful way, the court designed its risk contribution theory to determine various manufacturers' respective shares of liability. Under the court's theory, a jury assigns to each manufacturer the percentage of its financial responsibility for the judgment.¹⁴⁵ To arrive at the percentage of responsibility, the jury should consider not only the manufacturer's market share, but also its relative degree of fault and the egregiousness of its conduct:

In assigning a percentage of liability to each defendant, the jury may consider factors which include, but are not limited to, the following: whether the drug company conducted tests on DES for safety and efficacy in use for pregnancies; to what degree the company took a role in gaining FDA approval of DES for use in pregnancies; whether the company had a small or large market share in the relevant area; whether the company took the lead or merely followed the lead of others in producing or marketing DES; whether the company issued warnings about the dangers of DES; whether the company produced or marketed DES after it knew or should have known of the possible hazards DES presented to the public; and whether the company took any affirmative steps to reduce the risk of injury to the public.¹⁴⁶

143. 342 N.W.2d 37 (Wis. 1984) (adopting risk contribution theory in Wisconsin for the first time in an action against DES manufacturers).

144. *Id.* at 48.

145. *Id.* at 53.

146. *Id.*

The Wisconsin Supreme Court's risk contribution theory is unlikely to resolve what the court accurately identified as the inability of the judicial process to determine each manufacturer's share of liability with a meaningful degree of accuracy. For the same reasons described in *Skipworth v. Lead Industries Association*,¹⁴⁷ a risk contribution analysis is far more daunting in the lead pigment and lead paint context than in DES cases such as *Collins*. Under a risk contribution analysis, the respective manufacturers' market shares, which the *Collins* court acknowledged were impossible to determine accurately, remain one of the factors used to calculate liability.¹⁴⁸ To determine each defendant's market share in a lead pigment case such as *Thomas*, the jury must consider interdependent factors including, but not limited to, the timing of the various manufacturers' entry, exit, and sometimes re-entry into the relevant market; what percentage of the plaintiff's exposure to lead pigment occurred at each of the houses in which he lived; which years each of those houses were painted and each manufacturer's share of the market during that time period; and the possibility that lead pigments produced by various manufacturers were absorbed into the victim's body at different rates (a fact disputed between the parties). Once the jury determines the market share for each manufacturer, the jury must weigh these determinations alongside factors bearing on the level of egregiousness of each manufacturer's conduct; its knowledge of the product's dangers or its negligence in this regard; whether it tested its product for safety; and whether it "took the lead or merely followed others in producing or marketing" the product.¹⁴⁹ It is difficult to see how combining "apples and oranges"—the percentage of market share *and* the level of egregiousness of each defendant's conduct—in any way makes the jury's calculation more manageable.

In sum, both by detaching the notion of fungibility from chemical identity and including the consideration of factors that go to the level of egregiousness of the defendants' conduct, the Wisconsin Supreme Court has made its variant of market share liability less feasible, not more realistic. What the court has perhaps accomplished, however, is to make it virtually impossible for an appellate court, the legislature, the press, or commentators to say that any particular jury's determination of the respective shares of liability was clearly wrong under the multi-factor test of risk contribution theory.

V. THE UNDER- AND OVER-INCLUSIVENESS OF THE *THOMAS* DEFINITIONS

In his article, Rostron used a tripartite nomenclature to catalog previous judicial definitions of fungibility¹⁵⁰ and argued that fungibility is not coextensive with chemical identity.¹⁵¹ The *Thomas* court then adopted both Rostron's nomenclature

147. 690 A.2d 169, 172–73 (Pa. 1997) (describing the problems of an expansive time period and differing levels of lead).

148. *Collins*, 342 N.W.2d at 48–49, 53.

149. *Id.* at 53.

150. Rostron, *supra* note 17, at 163–67; *see supra* Part IV.A.1 (addressing Rostron's three categories of how courts have interpreted fungibility).

151. Rostron, *supra* note 17, at 168.

and his argument that chemical identity was not required for market share liability.¹⁵² The *Thomas* court then applied each of the three understandings of fungibility that Rostron derived from past judicial opinions,¹⁵³ but without acknowledging Rostron's conclusion that only one of the three understandings was "crucial for market share liability."¹⁵⁴

In this Part, we consider virtually all the previous market share liability cases not involving DES to discover how other courts have understood fungibility. As both Rostron and the Wisconsin Supreme Court observed, courts have understood fungibility to be a requirement for market share liability and have interpreted this requirement in one of three ways.¹⁵⁵ However, our analysis also reveals that any one of the *Thomas* definitions, or any combination of these understandings, is under-inclusive, over-inclusive, or both under- and over-inclusive, of the ideal universe of market share liability cases in light of the original policies that justified the creation of the doctrine. How a court defines fungibility is often outcome determinative. A survey of products that have been held fungible by some courts but not by others leads a cynical mind to suspect that judges apply the definition that produces their desired result. A less sinister explanation is that any definition of fungibility is indeterminate, and clever lawyering can exploit the malleability of any or all of these definitions.

The limitations of the *Thomas* definitions are the subject of this Part; Section A evaluates each individually, and Section B considers how they interact. In Part VI, we suggest an alternative formulation for when market share liability should apply, one that goes beyond mere cases involving chemical identity but remains true to the theory's underlying policy justifications.

A. *The Limitations of the Thomas Definitions*

1. *Functional Interchangeability*

The first *Thomas* definition of fungibility, functional interchangeability, is heavily context dependent.¹⁵⁶ The *Thomas* court explained the notion of context-dependence by way of example: "[F]or signaling New Year's Eve, a blast from an auto horn and one from a saxophone may be equivalent as noise, but few would want to dance to the former."¹⁵⁷ As this demonstrates, one probably could imagine some context to make any two objects functionally interchangeable. Fortunately, it seems that no court has been willing to fabricate an absurd context solely to hold dissimilar products fungible. Courts have, however, defined fungibility in a

152. *Thomas v. Mallett*, 701 N.W.2d 523, 559–61 (Wis. 2005).

153. *Id.* at 560–61.

154. Rostron, *supra* note 17, at 168.

155. *Thomas*, 701 N.W.2d at 561 (addressing Rostron's three categories of fungibility and concluding that "fungibility, therefore, is not a term that is capable of being defined with categorical precision").

156. *Id.* at 560.

157. *Id.* (quoting *Hamilton v. Accu-Tek*, 32 F. Supp. 2d 47, 51 (E.D.N.Y. 1998)).

functional interchangeability sense to downplay the fact that the disputed products do not pose a uniform risk. Put differently, functional interchangeability is over-inclusive when it groups manufacturers of defective products with manufacturers of nondefective products or groups manufacturers of products that pose widely varied levels of risk.

For example, *Ray v. Cutter Laboratories*¹⁵⁸ involved Factor VIII, a blood protein that promotes clotting.¹⁵⁹ Hemophiliacs take Factor VIII externally during bleeding episodes because their own bodies lack sufficient quantities.¹⁶⁰ In *Ray*, the plaintiff hemophiliacs allegedly contracted the Acquired Immune Deficiency Syndrome (AIDS) from an unidentifiable batch of Factor VIII, and they sued the manufacturers of the product under market share liability.¹⁶¹ The *Ray* court held that Factor VIII could be found to be fungible at trial, but the court first conceded that there were fundamental differences between DES and Factor VIII.¹⁶² Unlike DES, which was made from a generic formula,¹⁶³ the composition of each batch of Factor VIII depended on the pool of donors whose blood was included in that batch.¹⁶⁴ More importantly, while DES was uniformly defective,¹⁶⁵ some batches of Factor VIII were infected while others were not.¹⁶⁶ This distinction alone should have been dispositive because market share liability is predicated upon the uniform risk posed by products.¹⁶⁷ The *Ray* court nevertheless held that Factor VIII might be fungible because “one manufacturer’s Factor VIII product may essentially be used interchangeably with another manufacturer’s product.”¹⁶⁸

158. 754 F. Supp. 193 (M.D. Fla. 1991).

159. See *Smith v. Cutter Biological, Inc.*, 823 P.2d 717, 721 (Haw. 1991).

160. *Id.*

161. *Ray*, 754 F. Supp. at 195.

162. *Id.* at 195–96.

163. E.g., *Sindell v. Abbott Labs.*, 607 P.2d 924, 936 (Cal. 1980) (finding that all DES was manufactured from an identical formula).

164. *Ray*, 754 F. Supp. at 196.

165. See *Sindell*, 607 P.2d at 936.

166. *Ray*, 754 F. Supp. at 196.

167. See *supra* notes 40–46 and accompanying text (addressing how the products must pose the same quantum of risk for market share liability to fairly apportion liability based on the degree to which each manufacturer contributed to the total risk of harm).

168. *Ray*, 754 F. Supp. at 196. Indeed, the *Ray* court found persuasive that Florida does not specify any unique characteristics when it conducts bid invitations for “Antihemophilic Factor Concentrates.” *Id.* In *George v. Housing Authority of New Orleans*, the plaintiff also used a functional interchangeability argument. 906 So. 2d 1282, 1287 (La. Ct. App. 2005). In *George*, an apartment caught fire causing its residents (a mother and her three children) to evacuate. *Id.* at 1284. Regrettably, one child died from fire-related complications and another was severely burned. *Id.* The mother subsequently filed several suits, including one against smoke alarm manufacturers because her smoke alarm did not go off. *Id.* Addressing the market share liability claim, the *George* court defined fungibility as “commercially interchangeable with other property of the same kind” (i.e., functional interchangeability). *Id.* at 1287 n.1. The court then held that smoke alarms were not fungible because “different smoke alarms by different manufacturers have different qualities.” *Id.* at 1287. The court did not explain what those different qualities were or how they precluded one smoke alarm from being functionally interchangeable with another. The *George* court could not convincingly deny the application of market share liability because it adopted an over-inclusive definition of fungibility.

2. *Physical Indistinguishability*

Physical indistinguishability is the second *Thomas* definition of fungibility.¹⁶⁹ It is important because physically indistinguishable goods are difficult to trace back to their original manufacturers.¹⁷⁰ Physical indistinguishability can be under- or over-inclusive depending on the degree to which the definition requires that products must be indistinguishable from one another. For instance, the *Thomas* court held that lead pigments are not physically indistinguishable because differences between them were “available only on the microscopic scale.”¹⁷¹ Lead pigment, for example, came in three distinct chemical formulas.¹⁷² The *Thomas* definition of physical indistinguishability is arguably over-inclusive because it would consider water and diluted hydrofluoric acid, a colorless, tasteless poison, to be fungible. On the other hand, requiring physical indistinguishability on the microscopic scale is equivalent to demanding chemical identity, something the *Thomas* court refused to do because it would render fungibility under-inclusive.¹⁷³

Physical indistinguishability is under-inclusive for another reason: considerations other than physical appearance may link a defective product to its manufacturer. In *Russo v. Material Handling Specialties Co.*,¹⁷⁴ the court considered factors other than physical indistinguishability in determining whether a product was traceable to its original manufacturer.¹⁷⁵ In that case, a flight attendant was struck in the groin by an unsecured beverage cart.¹⁷⁶ As a result, he had to undergo removal of his right testicle and sympathetic nerve blocks.¹⁷⁷ The flight attendant sued the several manufacturers who supplied the beverage carts to the airline.¹⁷⁸ Because he was unable to identify the manufacturer of the cart that injured him, he relied on market share liability.¹⁷⁹ The *Russo* court imposed market share liability because the carts were uniformly defective and could not be traced back to their original manufacturers.¹⁸⁰ The carts were built from a generic design, and individual manufacturers did not place any model or serial number on their products.¹⁸¹ For all intents and purposes, the carts were physically indistinguishable. Moreover, the court noted that the airline did not have a tracking system to identify the manufacturer of a particular cart, which might have allowed the plaintiff to trace the physically indistinguishable carts back to their original manufacturers.¹⁸² The

169. *Thomas v. Mallet*, 701 N.W.2d 523, 560 (Wis. 2005).

170. *Id.* at 560 (citing *Rostron*, *supra* note 17, at 165).

171. *Id.* at 561.

172. *Id.* at 559 & n.45.

173. *Id.* at 559–60.

174. No. 9101209, 1995 WL 1146853 (Mass. Super. Ct. Aug. 29, 1995).

175. *Id.* 1995 WL 1146853, at *5.

176. *Id.* 1995 WL 1146853, at *1.

177. *Id.* 1995 WL 1146853, at *5.

178. *Id.* 1995 WL 1146853, at *1.

179. *Id.* 1995 WL 1146853, at *3.

180. *Id.* 1995 WL 1146853, at *6–7.

181. *Id.* 1995 WL 1146853, at *3.

182. *Id.* 1995 WL 1146853, at *5.

Russo court correctly recognized that considerations other than physical appearance, such as pattern of use, may link a defective product to its manufacturer.

The federal district court for the Southern District of New York applied similar reasoning in *In re Methyl Tertiary Butyl Ether ("MTBE") Products Liability Litigation*.¹⁸³ In that case, well owners brought a class action against petroleum manufacturers for allegedly polluting their groundwater with MTBE.¹⁸⁴ MTBE is a highly soluble gasoline additive that contaminates water faster and more pervasively than other gasoline components.¹⁸⁵ MTBE also is recognized by the government as a possible human carcinogen. "Every year over nine million gallons of gasoline with MTBE escape into the environment during transportation, storage, sale, or use in the United States."¹⁸⁶ The *In re MTBE* court addressed many issues, including whether market share liability could be invoked by well owners from states that recognized the theory.¹⁸⁷ The court held that the well owners sufficiently alleged MTBE was fungible, given its chemical nature and how it was sold, to survive dismissal under New York, California, and Florida law.¹⁸⁸ The court noted that the plaintiffs alleged MTBE lacked a "chemical signature" unique to a particular manufacturer.¹⁸⁹ Moreover, the plaintiffs further alleged that because MTBE is more water-soluble than other gasoline components, wells contaminated with MTBE showed little or no traces of other additives that could identify the manufacturer responsible for the contamination.¹⁹⁰ Additionally, the plaintiffs alleged petroleum manufacturers traded MTBE amongst each other, making identification even more indeterminable.¹⁹¹ The court's finding that plaintiffs' allegations sufficed to survive dismissal raises two important points. First, although different manufacturers' MTBE may be physically indistinguishable from one another, other gasoline components may help identify a specific manufacturer. Second, the petroleum manufacturers' practice of trading MTBE, which had no bearing on physical indistinguishability, contributed to the identification problem. The *In re MTBE* court implicitly recognized that fungibility in the physical indistinguishability sense is under-inclusive, leading it to examine other factors to determine whether a specific manufacturer could be linked to the contamination of particular wells.

183. 175 F. Supp. 2d 593 (S.D.N.Y. 2001).

184. *Id.* at 598–99.

185. *Id.* at 599.

186. *Id.*

187. *Id.* at 619–20 (citations omitted). The plaintiff class consisted of citizens of California, Florida, Illinois, and New York; only Illinois had declined to adopt market share liability. *Id.* at 620–23.

188. *See id.* at 621–22.

189. *Id.* at 621.

190. *See id.* at 599, 621.

191. *Id.* at 621.

3. *Uniformity of Risk*

Under the third *Thomas* definition of fungibility, a product is fungible if one manufacturer's product poses the same risk of harm as another's.¹⁹² Fungibility in the uniformity-of-risk sense, standing alone, is more over-inclusive than the other definitions because dissimilar products may pose a uniform risk of harm. Consider the following two cases. In *McGuinness v. Wakefern Corp.*,¹⁹³ several members of a family developed salmonella type "D" food poisoning after eating home-cooked lasagna.¹⁹⁴ The lasagna was made from eggs, noodles, mozzarella cheese, ricotta cheese, and pasta sauce, so the family sued the manufacturer of each ingredient under market share liability.¹⁹⁵ The theory presumably applied because the family did not know which ingredient was contaminated with the salmonella bacteria, so the chance of any particular ingredient causing the food poisoning was identical. An analogy may be helpful: in Russian roulette, only the gun chamber with the bullet poses a risk of harm; the other five are harmless. Not knowing which one has the bullet, however, makes each pull of the trigger pose the same risk of harm.

The *McGuinness* court ultimately chose not to impose market share liability because the manufacturers made "dissimilar products."¹⁹⁶ The court did not define fungibility or explain how the lasagna ingredients were dissimilar probably because the products were obviously neither functionally interchangeable nor physically indistinguishable.¹⁹⁷ Additionally, the ingredients were not proven to be uniformly defective; the plaintiffs did not show that every ingredient had salmonella. What they did show, ironically, was that each ingredient could have posed a uniform risk of harm.

Like the *McGuinness* family, the plaintiff in *Setliff v. E.I. Du Pont de Nemours & Co.*¹⁹⁸ sought to define fungibility in a uniformity of risk sense.¹⁹⁹ In that case, the employee of a paint store alleged that he sustained vital organ damage and nerve damage causing psychological injuries due to prolonged exposure to paint and solvent fumes.²⁰⁰ The employee sued some forty manufacturers of paint, solvents, strippers, and glue under market share liability,²⁰¹ alleging that "the products possessed 'common toxic chemical ingredients.'"²⁰² The *Setliff* court did not apply market share liability because even the employee conceded that it was not clear that there was a "'fungible' agent common to all the products."²⁰³ Again, the

192. *Thomas v. Mallet*, 701 N.W.2d 523, 560–61 (Wis. 2005).

193. 608 A.2d 447 (N.J. Super. Ct. 1991).

194. *Id.* at 448.

195. *Id.*

196. *Id.* at 449.

197. Indeed, the plaintiffs traced each ingredient back to its original manufacturer. *Id.* at 448.

198. 38 Cal. Rptr. 2d 763 (Ct. App. 1995).

199. *Id.* at 765.

200. *Id.*

201. *Id.* at 765.

202. *Id.* at 769.

203. *Id.* at 769–70.

employee reasonably argued that fumes from one or all of the paints and solvents could have caused his injury; therefore, each posed the same quantum of risk.

Even when used to analyze similar products, defining fungibility in the uniformity of risk sense tends to be over-inclusive because it may group manufacturers of defective products with manufacturers of nondefective products. *Ray v. Cutter Laboratories*,²⁰⁴ for example, involved batches of Factor VIII infected with AIDS. The *Ray* court recognized that some batches of Factor VIII were defective while others were not.²⁰⁵ One would assume, therefore, that Factor VIII was not fungible in the uniformity of risk sense because defective batches posed a risk of harm while nondefective batches did not. The *Ray* court, however, reasoned differently. Defective batches of Factor VIII were infected with AIDS because at that time, there was no formal process to screen blood donors for the disease.²⁰⁶ Thus, the probability that any given batch was infected with AIDS was the same (the Russian roulette rationale).

The *Ray* court's uniformity of risk definition of fungibility is over-inclusive because a manufacturer of a nondefective product may be held liable for the injuries caused by the manufacturer of a defective product. This result exceeds the scope of market share liability in *Sindell* because there, the DES manufacturers were held liable to the extent they either caused injury-in-fact or contributed to the risk of harm. Under *Ray*, a manufacturer that *neither* caused injury-in-fact *nor* contributed to the risk of harm could be held liable.²⁰⁷

Fungibility in the uniformity of risk sense may be under- or over-inclusive in another respect. Courts sometimes determine fungibility based on the variance in toxicity levels between products. Products with significantly varying toxicity levels do not pose a uniform risk of harm and hence, are not fungible. Products with toxicity levels that vary within a limited range pose a *relatively* uniform risk of harm and hence are fungible. The *Thomas* court provided the most reasoned explanation for the distinction: “[W]hether a product poses a uniform risk can depend on the choice of the unit for which risk is measured.”²⁰⁸ For example, “[w]hile each milligram of DES presented the same amount of risk, each DES pill did not, because the pills came in different dosages.”²⁰⁹ The *Thomas* court further explained that while “products may contain different concentrations of the hazardous substance, there is leeway to conclude that strict chemical uniformity does not render all substances fungible.”²¹⁰ Lead paint pigment is fungible in the uniformity of risk sense presumably because the lead concentration levels of the

204. 754 F. Supp. 193 (M.D. Fla. 1991).

205. *Id.* at 196.

206. *Id.*

207. *See id.* at 195–96.

208. *Thomas*, 701 N.W.2d 523, 561 (Wis. 2005) (quoting Rostron, *supra* note 17, at 166).

209. *Id.* (quoting Rostron, *supra* note 17, at 166).

210. *Id.* (citing Rostron, *supra* note 17, at 166–67).

different pigments varied within a limited range.²¹¹ The *Thomas* court did not, however, quantify what level of variance is dispositive of fungibility. Thus, fungibility in the uniformity of risk sense can be under-inclusive if a court requires, say, zero variance (i.e., chemical identity) or over-inclusive if a court only requires a common toxin.²¹² The latter scenario is what the *Thomas* dissent accused the majority of doing.²¹³

Different courts have found different levels of variance dispositive of fungibility. One court, for instance, held that a difference in the amount of a toxic ingredient contained in a product of between 0% and 5% precluded a finding of fungibility, while another court ruled that a difference of 20% was indicative of fungibility. In *Bly v. Tri-Continental Industries, Inc.*,²¹⁴ two auto mechanics died of leukemia, allegedly resulting from long-term exposure to gasoline containing benzene.²¹⁵ Their estates subsequently sued several gasoline manufacturers and suppliers, claiming the defendants were liable under market share liability.²¹⁶ The District of Columbia Court of Appeals held that the facts in *Bly* did not justify the adoption of market share liability.²¹⁷ The court reasoned that gasoline containing benzene was not fungible because it was not produced according to a single formula, and the benzene content of different manufacturers varied between 0% and 5%.²¹⁸

In *Wheeler v. Raybestos-Manhattan*,²¹⁹ the court held that asbestos brake pads were fungible enough to establish “the prima facie elements of a case for market share liability.”²²⁰ To do so, the court defined fungibility in a functional interchangeability sense, but also evaluated both physical indistinguishability and the uniformity of risk.²²¹ The court conceded that “from the standpoint of an auto mechanic,” the brake pads were not functionally interchangeable because different automobiles needed brake pads of varying shapes and sizes.²²² For that same reason, the court also recognized that the brake pads were not physically indistinguishable.²²³ The *Wheeler* court nevertheless concluded that the brake pads may be fungible because they all contained a single type of asbestos fiber,

211. *Contra id.* at 584 (Wilcox, J., dissenting) (arguing that lead paints and pigments were not identical due to the lack of uniform manufacturing formula, which resulted in “different levels of toxicity”).

212. *E.g., id.* at 562 (majority opinion) (finding white lead carbonates fungible because the lead “was the common denominator in the various white lead carbonate formulas”).

213. *Id.* at 585 (Wilcox, J., dissenting).

214. 663 A.2d 1232 (D.C. 1995).

215. *Id.* at 1234.

216. *Id.* at 1236–37.

217. *Id.* at 1245.

218. *Id.* at 1244 & n.9.

219. 11 Cal. Rptr. 2d 109 (Ct. App. 1992).

220. *Id.* at 113 (mentioning *Sindell v. Abbott Labs.*, 607 P.2d 294, 936 (Cal. 1980)).

221. *Id.* at 111 (“Webster’s defines fungible as ‘[o]f such a kind or nature that one specimen or part may be used in place of another specimen or equal part in the satisfaction of an obligation’ or ‘[i]nterchangeable.’”) (quoting WEBSTER’S NEW COLLEGIATE DICTIONARY 338 (7th ed. 1969)).

222. *Id.*

223. *Id.*

chrysotile.²²⁴ Moreover, the amount of chrysotile in the brake pads varied within a limited range of 40% to 60% of each pad's weight."²²⁵ The court determined this range demonstrated that "the risk of harm posed by the products of each manufacturer is more nearly equivalent."²²⁶ In short, the brake pads posed a relatively uniform risk of harm because the asbestos levels differed by only 20%. The *Wheeler* court's reasoning that a toxicity difference of 20% evinces fungibility is inconsistent with the *Bly* court's reasoning that a 5% difference precludes fungibility.²²⁷ Of course, benzene may be so much more toxic than asbestos that a 5% difference in the amount of toxicity of the former poses significantly greater risks than a 20% difference in the amount of toxicity of the latter. That said, the results of *Bly* and *Wheeler* appear inconsistent.

In short, long before *Rostron* first used the terms functional interchangeability, physical indistinguishability, and uniformity of risk, and before the Wisconsin Supreme Court ratified this nomenclature, courts functionally had used the three concepts in deciding whether to apply market share liability. The *Thomas* court was unclear about whether market share liability was justified by the presence of a single definition, whether all three definitions were required, or whether market share analysis depended upon a multi-factor balancing test.

Our analysis has shown that the use of any single definition, either in isolation from other definitions or as the overwhelmingly predominant definition, yields results that are incongruent with the policies underlying market share liability. Yet requiring that all three definitions be met is practically equivalent to demanding chemical identity. Most products that simultaneously are functionally interchangeable, physically indistinguishable, and uniformly risky are chemically identical. The next Section considers the viability and desirability of the intermediate approach, that is, using each of the three definitions as factors in a multi-factor balancing test.

B. *The Inconsistency of Multi-Factor Balancing Tests*

The *Thomas* court recognized the limitations in each of its three definitions of fungibility.²²⁸ Indeed, the court presumably offered three definitions, rather than just one, to mitigate the subjectivity of any single definition.²²⁹ This use of three definitions assumes that the interaction between the definitions minimizes the potential subjectivity inherent in any single factor, arguably because the under-

224. *Id.*

225. *Id.* at 109.

226. *Id.* at 111-12.

227. Compare *Bly v. Tri-Continental Indus., Inc.*, 663 A.2d 1232, 1244 n.9 (D.C. 1995) (concluding a difference of 5% in the amount of benzene the products contained precluded finding the products fungible), with *Wheeler*, 11 Cal. Rptr. 2d at 111 (concluding a difference of 20% in the amount of asbestos the products contained did not preclude finding the products fungible).

228. *Thomas v. Mallet*, 701 N.W.2d 523, 561-62 (Wis. 2005).

229. See *id.* at 561 ("Fungibility, therefore, is not a term that is capable of being defined with categorical precision.").

inclusiveness of one definition will compensate for the over-inclusiveness of another. However, several definitions of a single term, much like a multi-factor test, may equally be subject to inconsistent judicial treatment reflecting judicial bias.²³⁰ Courts may, for instance, give one definition more weight than another to arrive at a predetermined outcome. Room for play in the joints of a multi-factor test for fungibility can be seen when two courts assess the fungibility of the same product and reach opposite conclusions. A side-by-side comparison of these differing rationales reveals that the courts' conclusions depended on the definition of fungibility used or the significance placed on one definition over another. A brief examination of the fungibility of handguns, lead pigment, and Factor VIII is illustrative.

1. *Handguns*

In *Hamilton v. Accu-Tek*,²³¹ handgun victims sued handgun manufacturers for negligent marketing and distributing of firearms in a manner that made handguns more easily accessible to careless youths and violent criminals.²³² Judge Jack Weinstein held the manufacturers liable under market share liability because he found the theory was meant to address the societal harms posed by products like handguns.²³³ He observed that it is nearly impossible for a victim to identify the manufacturer of the handgun that caused the injury because most "crime guns" are never recovered.²³⁴ A ballistics analysis of recovered shell casings may eliminate possible manufacturers, but usually cannot identify a specific one.²³⁵ Judge Weinstein further reasoned that principles of loss distribution and loss minimization counsel for application of market share liability.²³⁶ He concluded that handguns were fungible in a functional interchangeability sense.²³⁷ Judge Weinstein noted, "From the point of view of criminals using them, there are no relevant differences between handguns."²³⁸ Indeed, "[t]he fungibility of handguns . . . is even clearer when viewed from the vantage point of shooting victims."²³⁹

230. See Carlos E. González, *The Logic of Legal Conflict: The Perplexing Combination of Formalism and Anti-Formalism in Adjudication of Conflicting Legal Norms*, 80 OR. L. REV. 447, 576 (2001) ("Courts can always manipulate the weight assigned to one or two factors in a balancing test . . . in order to avoid or select a problematic or desired substantive outcome."); Herma Hill Kay, *Chief Justice Traynor and Choice of Law Theory*, 35 HASTINGS L.J. 747, 795 (1984) ("[M]ulti-factor rules . . . lend themselves to manipulation and to the incorporation of contradictory approaches.").

231. 62 F. Supp. 2d 802 (E.D.N.Y. 1999), *vacated*, *Hamilton v. Beretta U.S.A. Corp.*, 126 F. Supp. 2d 882 (2nd Cir. 2001).

232. *Id.* at 808.

233. See *id.* at 841–43.

234. *Id.* at 843.

235. *Id.*

236. *Id.* at 843–44.

237. See *id.* at 844.

238. *Id.*

239. *Id.*

The New York Court of Appeals, on a certified question, disagreed with Judge Weinstein and held that handgun victims could not assert market share liability.²⁴⁰ To do so, the New York court first distinguished DES from handguns.²⁴¹ The court observed that DES was an “identical, generically marketed product,” while handguns were not.²⁴² The court emphasized “it [was] often possible to identify the caliber and manufacturer of the handgun that caused injury to a particular plaintiff.”²⁴³ The court also rejected the argument that the manufacturers’ marketing and distribution practices proximately caused the societal harm.²⁴⁴ After all, the plaintiffs never asserted that the handgun manufacturers’ marketing and distribution practices were uniform.²⁴⁵ This lack of uniformity was crucial because “[e]ach manufacturer engaged in different marketing activities that allegedly contributed to the illegal handgun market in different ways and to different extents.”²⁴⁶ In this situation, therefore, “a manufacturer’s share of the national market does not necessarily correspond to the amount of risk created by its alleged tortious conduct.”²⁴⁷

These two decisions, based on the same facts, demonstrate that different definitions of fungibility may produce different outcomes. To show that handguns were fungible, Judge Weinstein framed functional interchangeability in the broadest possible context: all criminals use handguns for the same purpose.²⁴⁸ In contrast, the New York Court of Appeals evaluated the functionality of handguns in a narrower context: handguns are not fungible because they are not identical; different handguns have different features.²⁴⁹ Regarding traceability, Judge Weinstein reasoned that it is impracticable to link an injured victim to a specific handgun manufacturer.²⁵⁰ The court of appeals, however, reasoned that it is not impossible to identify the manufacturer of the handgun that caused a particular injury.²⁵¹ Observe the subtle difference between impracticability and impossibility. The court of appeals noted that it is possible to link a particular injury to a specific manufacturer if both the gun and bullet are recovered.²⁵² But as Judge Weinstein

240. *Hamilton v. Beretta U.S.A. Corp.*, 750 N.E.2d 1055 (N.Y. 2001).

241. *Id.* at 1067 (citing *Hymowitz v. Eli Lilly Co.* 539 N.E.2d 1069 (N.Y. 1989)).

242. *Id.*

243. *Id.* (footnote omitted).

244. *Id.*; see also *Hamilton v. Accu-Tek*, 62 F. Supp. 2d at 808 (noting that the plaintiffs sought to recover in negligence based on “the manufacturers’ indiscriminate marketing and distribution practices”).

245. *Beretta*, 750 N.E.2d at 1067.

246. *Id.*

247. *Id.*

248. *Accu-Tek*, 62 F. Supp. 2d at 844.

249. *Beretta*, 750 N.E.2d at 1067; see also *George v. Housing Auth. of New Orleans*, 906 So. 2d 1282, 1287 (La. Ct. App. 2005) (“Since different smoke alarms by different manufacturers have different qualities, they cannot be deemed fungible.”); *supra* Part V.A.2 (discussing the *Thomas* definition of fungible as requiring the products be physical indistinguishable).

250. *Accu-Tek*, 62 F. Supp. 2d at 843.

251. *Beretta*, 750 N.E.2d at 1067.

252. *Accu-Tek*, 62 F. Supp. 2d at 845.

keenly observed, crime guns rarely are recovered.²⁵³ The court of appeals used an impossibility standard of traceability to conclude that handguns are not fungible, while Judge Weinstein used an impracticability standard to conclude that they are fungible. Regarding the uniformity of risk, Judge Weinstein asserted that each individual handgun poses the same quantum of risk because they are used for the same purpose.²⁵⁴ The court of appeals reasoned that the lack of uniform marketing practices differentiates each manufacturer's contribution to the total risk of harm.²⁵⁵ Judge Weinstein used the inherent nature of handguns to determine the quantum of risk, while the court of appeals examined how handguns are marketed and distributed.

2. Lead Pigment

As detailed above, the *Thomas* court held that lead pigment is fungible.²⁵⁶ To do so, the *Thomas* court first noted that lead pigments, and indeed any pigments used in paint, are functionally interchangeable because they are one of two necessary components of paint.²⁵⁷ The *Thomas* court determined lead paint pigments are physically indistinguishable because they can only be differentiated on the microscopic scale.²⁵⁸ Regarding the uniformity of risk, the court determined lead paint pigments pose the same quantum of risk because they contain a common toxic element, lead, the concentration of which varies within a limited range.²⁵⁹

In contrast, a New York court in *Brenner v. American Cyanamid Co.*²⁶⁰ held that lead pigment was not fungible. The court did not consider fungibility in the functional interchangeability sense, but it did find that lead pigments are not physically indistinguishable because different manufacturers used different types of pigments.²⁶¹ Unlike *Thomas*, the court in *Brenner* differentiated the pigments on the microscopic level.²⁶² Regarding the uniformity of risk, the *Brenner* court observed that the amount of lead pigment in different manufacturers' paints varied from 10% to 50%, and therefore "the finished product that was used by consumers here, i.e., lead-based paint, was not fungible."²⁶³ The court in *Brenner* concluded

253. *Id.* at 843.

254. *Id.* at 844.

255. *Beretta*, 750 N.E.2d at 1067.

256. *See supra* Part IV.B (discussing how the *Thomas* court extended market share liability into the context of lead paint).

257. *Thomas v. Mallet*, 701 N.W.2d 523, 561 (Wis. 2005) (noting that paint requires a pigment and a vehicle).

258. *Id.*

259. *Id.* at 562.

260. 699 N.Y.S.2d 848 (App. Div. 1999).

261. *Id.* at 853.

262. *Compare id.* (finding lead paint was not fungible because different types of paint had varying levels of toxicity based on manufacturers using different amounts and types of lead pigments), *with Thomas*, 701 N.W.2d at 561 (finding lead pigment and lead paint fungible because all of those products contain white lead carbonates); *see also In re MTBE Prods. Liab. Litig.*, 175 F. Supp. 2d 593, 621 (S.D.N.Y. 2001) (examining the "chemical signature" of MTBE to determine fungibility).

263. *Brenner*, 699 N.Y.S.2d at 853.

that the different manufacturers' lead pigments did not pose a uniform risk of harm.²⁶⁴ Similarly, in *Skipworth*,²⁶⁵ the Pennsylvania Supreme Court found that the different chemical formulations of lead pigment resulted in different risks to children because some lead pigment was more easily internalized by the body than other chemical formulations.²⁶⁶

3. Factor VIII

In *Ray v. Cutter Laboratories*,²⁶⁷ the court held that Factor VIII may be fungible.²⁶⁸ Under a functional interchangeability analysis, the court reasoned that all Factor VIII serves the same purpose regardless of the different donors and methods used to make each batch.²⁶⁹ The court also considered the uniformity of risk factor and noted that while only some batches of Factor VIII were infected with AIDS, there was an equal probability that any given batch was infected because none of the manufacturers screened for AIDS.²⁷⁰

In contrast, in *Doe v. Cutter Biological*,²⁷¹ the court held that Factor VIII was not fungible.²⁷² The court observed, under an analysis of physical indistinguishability, that each manufacturer's product "is clearly distinguishable by brand name, package color, lot number, and number of units of Factor VIII per vial."²⁷³ Indeed, the *Doe* court added, "it would have been possible—had plaintiff kept such records—to identify the [specific manufacturer]."²⁷⁴ The court also reasoned that Factor VIII did not pose a uniform risk of harm because only some batches were infected with the HIV virus.²⁷⁵

The *Ray* court used a functional interchangeability argument while the *Doe* court did not, but the *Doe* court used a traceability argument while the *Ray* court did not. This difference may be because functional interchangeability, contextualized broadly, tends to be over-inclusive; while physical indistinguishability, under an impossibility standard, tends to be under-inclusive. Both courts used fungibility in the uniformity-of-risk sense in different ways. The *Ray* court looked at the entire supply of Factor VIII and correctly determined that each batch had the same chance of being contaminated with the HIV virus as any other batch. The *Doe* court compared the contaminated batches with the

264. *Id.* Recall, this lack of a uniform risk of harm also was the thrust of Justice Wilcox's dissenting opinion in *Thomas v. Mallet*, 701 N.W.2d at 584 (Wilcox, J., dissenting).

265. *Skipworth v. Lead Indus. Ass'n*, 690 A.2d 169, 173 (Pa. 1997).

266. *See id.* at 173.

267. 754 F. Supp. 193 (M.D. Fla. 1991).

268. *Id.* at 196.

269. *Id.*

270. *Id.*

271. 852 F. Supp. 909 (D. Idaho 1994).

272. *Id.* at 913.

273. *Id.* (quoting *Smith v. Cutter Biological, Inc.*, 823 P.2d 717, 733 (Haw. 1991) (Moon, J., dissenting)).

274. *Id.*

275. *Id.* at 913.

uncontaminated ones and concluded that the former posed greater risks than the latter.

VI. A PURPOSIVE RESTATEMENT OF THE REQUIREMENTS FOR MARKET SHARE LIABILITY

The *Thomas* court's attempt to define fungibility was long overdue, but it should be considered a starting point rather than the apodictic standard governing the proper application of market share liability. One way to improve the *Thomas* definitions would be to align them with the policies behind market share liability. The boundaries within which market share liability can operate should be defined purposively, rather than linguistically, on the basis of an understanding of "fungibility." The use of the term itself should be restricted to whether a product poses a uniform risk as we argue in Section A.

Should market share liability ultimately apply, the plaintiff is relieved from proving the most basic requirement of traditional tort law, cause in fact, which is proving that a specific tortfeasor caused the harm. Therefore, application of market share liability should be limited to situations also satisfying two other requirements. First, it must be impossible, as a practical matter, for the victim to trace his injury to the product of a particular manufacturer, as we discuss in Section B. Though this is not, strictly speaking, a matter of fungibility, two of the *Thomas* court's understandings of fungibility, physical indistinguishability and functional interchangeability, strongly suggest the victim's inability to trace the causal connection back to a specific manufacturer. Second, for market share liability to apply, a court must be able to determine each manufacturer's market share, with at least a reasonable degree of approximation. If courts cannot make such an approximation, the plaintiff should not be allowed to recover under market share liability. Section C describes the court's obligation to decide whether market shares can be determined in a meaningful manner.

Under our proposal, each of the requirements outlined in this Part must be satisfied for market share liability to apply. Unlike the Wisconsin Supreme Court's opinion in *Thomas*, there is no ambiguity in our proposal. Merely satisfying one of the factors is not enough. Nor does this proposal call for a balancing test. Finally, the court, not the jury, determines whether the requirements are satisfied as a matter of law.

A. *Uniform Products Must Pose Risk in a Uniform Manner and to a Uniform Degree*

It is easy to understand why courts have used some variant of a uniformity of risk standard to analyze market share liability cases.²⁷⁶ If products pose a uniform

276. See, e.g., *supra* Part V.A.3 (noting that courts can determine whether a product is fungible by determining whether the products have the same quantum of risk).

risk, then each manufacturer's share of distribution of that product neatly approximates the harm the manufacturer caused.²⁷⁷

The problems that result from such a standard, if it is either employed by itself or not carefully articulated, may be less obvious. As one paradigmatic example, the McGuinness family could not identify which lasagna ingredient was contaminated with salmonella, so they argued that each ingredient posed a uniform risk in the hopes of triggering market share liability.²⁷⁸ The uniformity of risk factor really consists of three separate elements: (1) uniformity of product identity, (2) uniformity of either product defectiveness or the manufacturer's other tortious conduct, and (3) uniformity in degree of risk.

1. *Uniformity of Product Identity*

Under the first element, the disputed products must be, in a common sense manner, identical. Even if multiple ingredients in household cleaning agents may cause harmful health effects, courts should not join in a single action the manufacturers of these different agents.²⁷⁹ Nor should courts apply market share liability against the manufacturers of the lasagna ingredients.²⁸⁰

In reality, the reasons for requiring product identity bear more upon the factors of untraceability and the judicial determination of market shares, discussed in Sections B and C, than they do upon any requirement that products pose equivalent risks. First, as previously discussed,²⁸¹ market share liability is not justified for actions involving manufacturers of traceable products. Products that are not identical are more easily traceable to their manufacturer than are identical products.

Second, and more importantly, it is conceptually meaningless for a court to determine the market shares of products that are not identical. What is the point of determining the respective market shares of the manufacturers of two different products, say cheese and noodles, when the manufacturers of these products are not even in the same market? Finally, because market share liability is a rare exception to the requirement that a plaintiff prove the identity of the tortfeasor that caused the harm, it seems reasonable to restrict the application of the doctrine to situations involving essentially identical products.

277. Rostron also may be correct that even if products do not pose uniform risks, it may be possible, at least theoretically, to adjust each manufacturer's market share to reflect differing degrees of risk. Rostron, *see supra* note 17, at 168–73. However, this additional step adds to the complexity of determining each manufacturer's share and often will exceed the court's competence.

278. *McGuinness v. Wakefern Corp.*, 608 A.2d 447, 448 (N.J. Super. Ct. 1991); *see supra* notes 192–96 and accompanying text.

279. *See Setliff v. E.I. Du Pont de Nemours & Co.*, 38 Cal. Rptr. 2d 763, 768–70 (Ct. App. 1995) (declining to impose market share liability to manufacturers of paints, glues, and solvents).

280. *See McGuinness*, 608 A.2d at 448–49.

281. *See supra* Part V.A.2.

2. *Uniformity of Product Defectiveness or Other Tortious Conduct*

For market share liability to apply, the plaintiff should be required to prove that each manufacturer's product is defective in a uniform way or that each manufacturer's conduct was otherwise tortious in a uniform way. Again, in the lasagna case, it is highly probable that only one of the ingredients was, in fact, contaminated with salmonella; therefore, the application of market share liability would have been inappropriate.²⁸² *Sindell* itself also required the plaintiff prove that each of the manufacturers engaged in tortious conduct.²⁸³ The loss minimization rationale that justifies market share liability²⁸⁴ makes sense only if all of the manufacturers are engaged in tortious conduct, not if only one or some of the possible defendants have acted tortiously.

Not only must each manufacturer's conduct be tortious, the conduct must be tortious in an identical way.²⁸⁵ Consider an action seeking to impose market share liability on handgun manufacturers. Some manufacturers' guns had a design defect because they lacked a trigger safety lock,²⁸⁶ some had a manufacturing defect in the form of a malfunctioning safety lock,²⁸⁷ and some were negligently marketed and distributed.²⁸⁸ These distinct forms of tortious conduct would make meaningless any determination of either the uniformity of risk or the manufacturers' respective shares of the market. Presumably, separate market determinations would need to be made for the market for guns without safety locks, the market for guns with malfunctioning safety locks, and the market for guns negligently distributed.

3. *Uniformity in Degree of Risk*

During its 2006 session, the Maryland General Assembly considered and rejected legislation that would have held manufacturers of lead paint, but not manufacturers of lead pigment contained in the paint, liable under market share

282. See *McGuinness*, 608 A.2d at 448.

283. *Sindell v. Abbott Labs.*, 607 P.2d 924, 936–37 (Cal. 1980).

284. *Id.* at 936.

285. In *Hamilton v. Accu-Tek*, the district court sought to impose market share liability upon handgun manufacturers not because the handguns were defective, but because the manufacturers' negligent marketing and distribution practices made the guns easily accessible to criminals. 62 F. Supp. 2d 802, 844 (E.D.N.Y. 1999), *vacated*, *Hamilton v. Beretta U.S.A. Corp.*, 126 F. Supp. 2d 882 (2d Cir. 2001).

286. *E.g.*, *Sturm, Ruger & Co. v. Bloyd*, 586 S.W.2d 19, 23 (Ky. 1979) (addressing whether the lack of a safety lock on a gun supported the plaintiff's claim alleging negligent design by a gun manufacturer); *Halliday v. Sturm, Ruger & Co.*, 770 A.2d 1072, 1092 (Md. Ct. Spec. App. 2001), *aff'd en banc*, 792 A.2d 1145 (Md. 2002) (holding the plaintiff's claim failed under the doctrine of misuse even if the lack of a child safety lock on the gun was a design defect).

287. *E.g.*, *Rodriguez v. Glock, Inc.*, 28 F. Supp. 2d 1064, 1072 (N.D. Ill. 1998) (assuming a malfunctioning safety lock was a manufacturing defect for summary judgment purposes); *Abrams v. Marlin Firearms Co.*, 838 So. 2d 975, 978 (Miss. 2003) (considering the plaintiff's allegation that the gun's safety lock malfunctioned).

288. *Hamilton*, 62 F. Supp. 2d at 845.

liability.²⁸⁹ Yet it was clear that equal amounts of lead paint do not pose uniform risks. The chemical composition of paint varied widely before 1955; the amount of lead by weight in paint ranged from less than 2% to more than 70%.²⁹⁰ In these circumstances, market share liability is inappropriate because one unit of one product posed a risk 35 times as great as another containing much less lead.²⁹¹ Thus, a requirement that various manufacturers' products pose a uniform level of risk remains a foundational premise for market share liability. In the absence of such a requirement, a manufacturer's share of the market does not reflect its proportionate share of the harm.

B. Practical Impossibility of Tracing the Victim's Harm to a Specific Manufacturer

The second *Thomas* definition, physical indistinguishability, actually is a secondary factor that serves as a proxy for one of our requirements of market share liability: the impossibility, as a practical matter, of tracing the harm-causing product back to its specific manufacturer. Similarly, the first *Thomas* definition, functional interchangeability, also affects traceability, but it has a far greater impact on the judicial determination of market shares. The impact of functional interchangeability on the judicial determination of market shares is discussed in Section C.

1. Physical Indistinguishability as a Proxy for the Absence of Traceability

Fungibility in the physical indistinguishability sense, as described by the Wisconsin Supreme Court,²⁹² is better understood through the lens of the traceability requirement. Courts should examine the physical indistinguishability of products to determine whether any given product can be traced back to its original manufacturer. As previously described, however, physical indistinguishability is both under- and over-inclusive as a proxy for the traceability

289. See H.B. 1394, 2006 Leg., 421st Sess. (Md. 2006), available at <http://mlis.state.md.us/2006rs/bills/hb/hb1394f.pdf>. This bill received an unfavorable report from the house judiciary committee. MARYLAND LEGISLATIVE INFORMATION, HOUSE BILL 1394 STATUS REPORT, <http://mlis.state.md.us/2006rs/billfile/hb1394.htm>.

290. Compare AM. STANDARD SPECIFICATIONS, *supra* note 66, § 2(a) (indicating the voluntary industry standard adopted in 1955 that limited lead content in paint to no more than 1% of total weight), with BUREAU OF STANDARDS, U.S. DEPT. OF COMMERCE, UNITED STATES GOVERNMENT MASTER SPECIFICATION FOR PAINT, WHITE, AND TINTED PAINTS MADE ON A WHITE BASE, SEMIPASTE, AND READY MIXED (Standard Specification No. 10b), in CIRCULAR OF THE BUREAU OF STANDARDS, No. 89, at 2 (3d ed. 1927) (requiring that white base, semipaste paint purchased by the federal government include between 45% and 70% white lead).

291. *But see* Rostron, *supra* note 17, at 174 (suggesting that one could "adjust market share data to achieve an allocation of liability that reasonably reflects the likelihood of each manufacturer having caused a plaintiff's injury"). Under Rostron's theory, one would first determine the market shares of each paint manufacturer and then adjust the percentages to account for the varying lead concentrations among them. See *supra* notes 110–16, 120–31 and accompanying text.

292. *Thomas v. Mallett*, 701 N.W.2d 523, 560 (Wis. 2005).

of a product.²⁹³ For example, courts can examine factors other than physical indistinguishability to determine the extent of the traceability problem.²⁹⁴ Further, fungibility in the physical indistinguishability sense can be manipulable.²⁹⁵ For instance, Wisconsin has held that lead paint pigment is fungible, while New York has held that it is not, partly because Wisconsin does not require physical indistinguishability on the microscopic scale, while New York does.²⁹⁶ The decision to adopt one standard of physical indistinguishability over another is an inherently subjective judicial enterprise.

2. *Functional Interchangeability as a Traceability Factor*

Recall that another of the *Thomas* definitions of fungibility is functional interchangeability, that is, each manufacturer's product must be functionally interchangeable with the product of another.²⁹⁷ This definition affects both the traceability question and the judicial determination of market shares; the latter is discussed in Section C.

Even if multiple manufacturers' products are physically indistinguishable and pose a uniform risk of harm, market share liability still is not justified unless the products are used for the same or similar purposes. This requirement ensures that disputed products comprise a single, definable market. For example, in *Brenner v. American Cyanamid Co.*, the court found that the plaintiffs had "not narrowed the national market to include only those manufacturers of white lead carbonate that sold the product for interior residential use."²⁹⁸ In other words, the plaintiffs had not limited the market to products that were functionally interchangeable. The *Brenner* court continued, "[i]n addition to interior residential paint, white lead carbonate was used for products such as exterior residential paint and nonresidential paint, uses that are not alleged to be harmful. Plaintiffs have not produced evidence of any single defendant's share of the relevant market for interior residential paint use."²⁹⁹

Functional interchangeability limits the market to include only the manufacturers of products used for a specific purpose. This limitation obviously affects whether the plaintiff can trace the harm-causing product back to its specific manufacturer. If, for example, evidence exists that the products of a specific lead pigment were used exclusively in exterior paints, it cannot be claimed that this specific manufacturer produced pigment used in interior paints.

293. *See supra* Part V.A.2.

294. *See supra* notes 174–90 and accompanying text.

295. *See supra* Part V.A.1.

296. *Compare Thomas*, 701 N.W.2d at 561 (holding lead paint is physically indistinguishable because the various differences in lead pigment "are available only on the microscopic scale"), *with Brenner v. Am. Cyanamid Co.*, 699 N.Y.S.2d 848, 853 (App. Div. 1999) (holding lead paint was not fungible partly because it is physically distinguishable on the microscopic scale). *See also supra* notes 171–73 and accompanying text.

297. *Thomas*, 701 N.W.2d at 560; Rostron, *supra* note 17, at 163–64.

298. 699 N.Y.S.2d at 852.

299. *Id.*

The lack of traceability remains a foundational presumption of market share liability because it justifies the departure from the traditional tort standard that requires plaintiffs prove causation. While fungibility understood as physical indistinguishability most often squares with cases in which the victim cannot trace the product to a specific manufacturer, it is both under- and over-inclusive. Functional interchangeability also affects traceability, but it is only a single factor that may suggest whether it is reasonable to expect the victim to trace her harm to a specific manufacturer. Instead of focusing on functional interchangeability, courts should directly address the question of whether it is feasible for the plaintiff to trace the product that caused her harm to the specific manufacturer that produced it.

3. *Traceability: An Impossibility Standard or an Impracticality Standard?*

The extent to which a product must be untraceable to justify applying market share liability has never been squarely examined in a published opinion. Must it be impossible, or merely impracticable, to trace a product back to its original manufacturer? The court in *In re Dow Corning Corp.*³⁰⁰ suggests an impossibility standard.³⁰¹ That case was a bankruptcy action against a debtor who manufactured defective breast implants.³⁰² The United States sought to recover from the manufacturer medical costs that the government provided victims injured by the manufacturer's breast implants.³⁰³ Among the many theories the United States invoked to support its claim was market share liability.³⁰⁴ The United States used this theory to avoid having to identify each and every victim of the manufacturer's breast implants.³⁰⁵ The court did not impose market share liability because breast implants are not fungible goods.³⁰⁶ Fungibility, the court noted, means that "one defendant manufacturer's product must be indistinguishable from the next manufacturer's product."³⁰⁷ Breast implants were distinguishable because manufacturers used "different designs and compositions."³⁰⁸ Furthermore, the court added, "[t]he mere fact that it may be *difficult* for the plaintiff to establish product identification is insufficient to invoke the market-share theory [M]ere

300. 250 B.R. 298 (Bankr. E.D. Mich. 2000).

301. *See id.* at 363. *But see* *Sindell v. Abbott Labs.*, 607 P.2d 924, 927 (Cal. 1980) (footnote omitted) (noting that one plaintiff was able to identify the manufacturer of the DES her mother took); *Abel v. Eli Lilly & Co.*, 343 N.W.2d 164, 168 (Mich. 1984) (noting that "[s]ome plaintiffs have specifically named the product to which they were exposed *in utero* and its manufacturer.").

302. *In re Dow Corning Corp.*, 250 B.R. at 307.

303. *Id.*

304. *Id.* at 360.

305. *Id.*

306. *Id.* at 363.

307. *Id.* (citing *Sindell v. Abbott Labs.*, 607 P.2d 924, 936 (Cal. 1980); *Bly v. Tri-Continental Indus., Inc.*, 663 A.2d 1232, 1243–45 (D.C. 1995); *Hymowitz v. Eli Lilly & Co.*, 539 N.E.2d 1069, 1075 (N.Y. 1989); 63 AM. JUR. 2d *Products Liability* § 183).

308. *Id.* (citing *In re N.Y. State Silicone Breast Implant Litig.*, 631 N.Y.S. 491, 494 (Sup. Ct. 1995)).

difficulty in producing evidence is not sufficient to excuse a party having to do so.”³⁰⁹

Market share liability is a departure from the traditional starting point in civil litigation where a plaintiff must prove all the elements of the tort to recover. As such, it is reasonable to require a burden beyond mere difficulty of proof to satisfy the traceability requirement and warrant market share liability.³¹⁰ At the same time, the hypothetical ability of the plaintiff to prove the requisite causal connection between a particular victim and a specific manufacturer should not, in all cases, prevent the use of market share liability.

Recall that a few DES daughters were able to identify the specific drug manufacturer whose product their mothers took during pregnancy.³¹¹ For this reason, we believe that a “practical impossibility” standard best preserves the integrity of tort law. Such a standard allows the use of market share liability, if the other requirements are met, in those instances where there is no realistic chance for an injured consumer to identify the manufacturer of the product causing her harm.

The Supreme Court of Texas used a practical impossibility standard in *Gaulding v. Celotex Corp.*³¹² In that case, a husband purchased from a salvage yard an asbestos-laden board that he used to make a cabinet for his wife.³¹³ Though she outlived him, the wife died of mesothelioma, an asbestos-related disease, so her children sued the possible manufacturers of the board under market share liability.³¹⁴ The court recognized that it was practically impossible for the plaintiffs to identify the specific manufacturer of the board.³¹⁵ The court did not, however, impose market share liability because it also was practically impossible to determine market shares as the board could have been made anywhere at any time.³¹⁶ Market share liability would be appropriate, however, in a situation in which it is possible to determine market shares but practically impossible to identify the actual tortfeasor.³¹⁷

309. *Id.* (emphasis added and citations omitted).

310. *See Sindell*, 607 P.2d at 936 (modifying traditional principles of causation in exceptional cases); *Hymowitz*, 539 N.E.2d at 1075 (“modify[ing] the rules of personal injury liability” for the DES situation, which posed “inordinately difficult problems of proof.”) (quoting *Bichler v. Lilly & Co.*, 436 N.E.2d 182, 185 (N.Y. 1982)); *Collins v. Eli Lilly Co.*, 342 N.W.2d 37, 49 (Wis. 1984) (recognizing that the DES situation posed “difficult problems” that warranted the creation of a new theory of causation).

311. *Sindell*, 607 P.2d at 927 (noting that one plaintiff was able to identify the manufacturer of the DES her mother took); *Abel v. Eli Lilly & Co.*, 343 N.W.2d 164, 168 (Mich. 1984) (same).

312. 772 S.W.2d 66, 71 (Tex. 1989).

313. *Id.* at 67.

314. *Id.* at 67, 70.

315. *Id.* at 71.

316. *Id.*

317. Hypothetically, if the product in *Gaulding* had been made by a fixed number of manufacturers whose market shares in Texas mirrored their national market shares, it would have been possible to determine market shares but still practically impossible to identify the actual tortfeasor.

4. *Traceability in Parens Patriae and Other Collective Tort Actions*

Litigation against the indeterminate manufacturers of harm-causing fungible products often is brought by a collective entity, such as the state or municipal government,³¹⁸ a class-action representative,³¹⁹ or hospital or medical insurer, seeking recoument of medical expenses.³²⁰ In these collective actions, particularly *parens patriae* actions brought by state or municipal governments, the untraceability requirement is less important because, by definition, the harm to the state is collective in nature. The government is therefore not expected to submit individualized proof establishing causal connections between the harms experienced by each particular resident and each specific manufacturer and then to tally the results. Instead, the state or municipality relies upon statistical and sampling evidence to prove the harm to the collective entity in the aggregate.

In this context, the untraceability requirement assumes a lesser role in determining whether to apply market share liability. However, the requirement of judicial capacity to accurately determine market shares assumes a greater importance. If courts are allowed to use market share liability as a substitute for the tallying of individually-caused harms, even greater scrutiny of the accuracy of the trial court's determination of market shares is warranted. The lack of ability to trace the causal connection between individual victims and specific manufacturers is not irrelevant. Appellate courts reviewing a trial court's allocation of manufacturers' shares of financial responsibility under a market share analysis should be wary if the government plaintiff and the trial court had the capacity to trace causal connections between individual victims of product-caused harms and specific manufacturers and instead opted to rely upon market share analysis and statistical and sampling data.

C. *Judicial Competence to Determine Market Shares*

With any particular product, several individual factors indicate the feasibility of a court determining market shares. First, can the time interval during which the tortious conduct occurred be limited to a finite and reasonably short time-frame? In the DES cases, the applicable time is only slightly longer than nine months. By contrast, it is unlikely that courts are capable of meaningfully determining market

318. See, e.g., *City of Philadelphia v. Lead Indus. Ass'n*, 994 F.2d 112, 114 (3d Cir. 1993) (noting the city and Philadelphia Housing Authority "brought this action against [the] manufacturers of lead pigment"); *City of Milwaukee v. NL Indus., Inc.*, 691 N.W.2d 888, 890 (Wis. Ct. App. 2004) (indicating the city brought the action against lead paint manufacturers); see also Forelle *supra* note 1, at D7 (reporting the jury verdict awarding the State of Rhode Island damages in a lead paint action).

319. E.g., *In re MTBE Prods. Liab. Litig.*, 175 F. Supp. 2d 593, at 598 (S.D.N.Y. 2001) (consolidating putative class actions brought by well owners against benzene manufacturers); *Sindell v. Abbott Labs.*, 607 P.2d 924, 925 & n.1 (Cal. 1980) (involving class actions brought by daughters of women who took DES); *Lewis v. Lead Industries Ass'n, Inc.*, 793 N.E.2d 869, 871 (Ill. App. Ct. 2003) (involving class actions brought by parents of lead poisoning victims).

320. See *In re Dow Corning Corp.*, 250 B.R. 298, 307, 363 (Bankr. E.D. Mich. 2000) (denying market share liability claim by the U.S. government acting as health insurer of last resort).

shares³²¹ in a situation where a child has been poisoned by lead in a home that was painted multiple times at indeterminate dates between the time that paint containing lead pigment was first commonly available in the 1870s³²² to when the sale of lead paint was outlawed in 1978.³²³

The second factor suggesting the feasibility of meaningfully determining market shares is the length of time that has passed between the time of the product's manufacture or distribution (regardless of the duration of the period in which manufacturers may have produced the products that may have caused plaintiff's harm) and the time of trial.³²⁴ It usually is far easier to determine market shares with a reasonable degree of accuracy for a product sold and distributed in the 1990s than for a product sold and distributed in 1890s, even if the periods for which market shares must be determined are of equivalent length.

The third recurring set of factors influencing the feasibility of the determination of market shares is the number of producers in the relevant market³²⁵ and the fluidity of entry and exit from that market.³²⁶ It is one thing to determine market shares in a context in which there always were three manufacturers of the harm-causing product and all three manufacturers began production and stopped production at roughly the same time. It is far more difficult if there are hundreds of manufacturers and these manufacturers entered the market at different times, exited the market at various times, and often re-entered and re-exited the market.

Finally, *Thomas's* first definition of fungibility, functional interchangeability, may affect the judicial competence to meaningfully calculate market shares, just as it does in determining whether a harm-causing product can be traced back to its

321. See, e.g., *Santiago v. Sherwin Williams Co.*, 3 F.3d 546, 550–51 (5th Cir. 1993) (citing plaintiff's inability to specify the time of the manufacturers' negligence as a reason to deny market share claims); *Jefferson v. Lead Indus. Ass'n*, 930 F. Supp. 241, 247 (E.D. La. 1996), *aff'd*, 106 F.3d 1245 (5th Cir. 1997) (citing plaintiff's inability to allege a time when the lead paint was applied as a reason to deny applying market share liability); *Brenner v. Am. Cyanamid Co.*, 699 N.Y.S.2d 848, 852 (App. Div. 1999) ("Applying market share liability in the context of this case would result in liability disproportionate to the risk created."); Donald G. Gifford, *The Peculiar Challenges Posed by Latent Diseases Resulting from Mass Products*, 64 MD. L. REV. 613, 658–60 (2005) (discussing courts' frequent inability to assess shares of liability of individual manufacturers); *Rostron*, *supra* note 17, at 209–10 (noting that the "inability of determining the timing of tortious conduct will remain an insurmountable obstacle to proportional share liability in some circumstances").

322. *Skipworth v. Lead Indus. Ass'n, Inc.*, 690 A.2d 169, 171 (Pa. 1997).

323. See *supra* note 65.

324. In *Sindell*, DES was manufactured from 1947 to 1971 and the plaintiff sued in 1976. *Sindell v. Abbott Labs.*, 149 Cal. Rptr. 138, 151 (Ct. App. 1978), *rev'd*, 607 P.2d 924 (Cal. 1980); *Sheiner*, *supra* note 5, at 963 n.1. The lead pigment used in *Thomas* was available from 1900 to 1980 in Wisconsin; the suit was filed in 1999. *Thomas v. Mallet*, 701 N.W.2d 523, 530 (Wis. 2005).

325. See, e.g., *Sindell v. Abbott Labs.*, 607 P.2d at 937 (noting that five to six companies controlled 90% of the DES market); *Thomas*, 701 N.W.2d at 570 (Wilcox, J., dissenting) (observing that there were some 200 paint manufacturers in the Milwaukee area between 1910 and 1971).

326. See, e.g., *Skipworth*, 690 A.2d at 173 ("Over the one hundred year period at issue, several of the pigment manufacturers entered and left the lead paint market."); *Thomas*, 701 N.W.2d at 570–71 (Wilcox, J., dissenting) (detailing the times during which the various pigment manufacturers entered and exited the market).

specific manufacturer.³²⁷ If lead pigment, for example, was an ingredient in a variety of products other than interior residential paint, then the appropriate market for determining each manufacturer's market share is not the sales of all lead pigment, but rather only the sales of all lead pigment used for interior paint. It is possible, indeed likely, that some lead pigment manufacturers sold their product as an ingredient in one finished consumer product, while others sold theirs as an ingredient in a second finished product. These markets must be differentiated if the volume of product distribution is to serve as a meaningful proxy for harm caused. This too becomes a complicating factor.

With the addition of the multiple factors outlined above, as well as others not described, the process of determining market shares becomes geometrically more complex because of the interaction of the various factors. With lead pigment or lead paint, the time of possible exposure may be as great as a century, and residences were painted at unknown times and irregular intervals. With lead paint, the number of producers numbered in the hundreds. In the case of lead pigment, the product had multiple uses, many of which posed little or no risk to children. It is difficult to see how proponents of litigation against manufacturers of lead paint or lead pigment can convincingly claim that courts are capable of determining the market shares for these manufacturers with even a reasonable degree of approximation.

VII. CONCLUSION

Childhood lead poisoning is a significant and under-appreciated public health crisis. Funding is required to address the crisis and to eliminate lead paint hazards, and it is understandable that many public officials and judges, intellectual heirs of the 1960s, believe that courts, more than legislatures, are the appropriate institutions to solve this public health crisis.³²⁸ But courts are not legislatures. They do not have the power to tax specific industries or to appropriate funds to remedy a pervasive public health crisis. The authority of any court to transfer money from one party to another is inextricably linked to proof of a required causal connection, however defined, between the injurer's tortious conduct and the victim's injury. Market share liability purports to be an alternative means of proving causation, not a new, extra-constitutional grant of taxation and spending powers to the courts. The requirements of market share liability outlined here are based on judicial competence and feasibility. If market share liability in any given factual context cannot realistically apportion financial responsibilities among manufacturers in a manner that reasonably approximates the harms caused by each manufacturer, then the assessment of damages under market share liability is not an appropriate judicial function.

327. See *supra* Part VI.B.2.

328. See generally John C.P. Goldberg & Benjamin C. Zipursky, *Accidents of the Great Society*, 64 MD. L. REV. 364 (2005) (viewing Guido Calabresi's *The Cost of Accidents*, published in 1970, as both "reflecting the time" and calling for a judicially based "regulatory scheme").

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