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Kill Cammer: Securities Litigation Without Junk Science

J. B. Heaton

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KILL CAMMER: SECURITIES LITIGATION WITHOUT JUNK SCIENCE

J.B. HEATON*

ABSTRACT

Securities litigation is a hotbed of junk science concerning market efficiency. This Article explains why and suggests a way out. In its 1988 decision in Basic v. Levinson, the Supreme Court endorsed the fraud on the market presumption for securities traded in an efficient market. Faced with the task of determining market efficiency, courts throughout the nation embraced the ad hoc speculations of a first-mover district court that proclaimed, in Cammer v. Bloom, how to allege (and presumably prove) facts that would do just that. The Cammer court's analysis did not rely on financial economics for its notions, but instead regurgitated the assertions of a single plaintiff's expert affidavit—from a securities law professor, not a financial economist—and a securities law treatise equally uninformed by the relevant field. The result has been thirty years of junk science in securities adjudication. This Article traces the development of the fraud on the market theory from its pre-efficient-markets-hypothesis roots through a brief “gilding the lily” phase where an appeal to social science results on market efficiency was only an ancillary, bolstering argument for already-sufficient precedent for the fraud on the market presumption, to the requirement that litigants plead and prove efficiency using indicia with no support in financial economics. The way out of this embarrassing state of affairs is to return to the roots of fraud on the market in the non-technical notion of “a free and open public market” that inquires only whether the market for the security at issue is open to active buyers and sellers and is not subject to substantial seller lockups or

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bans on short selling. It is reasonable to presume that prices in such free and open public markets can be distorted by fraud, a presumption that is then rebuttable by establishing (1) that the alleged fraud in fact had no price impact; (2) that there are substantial limits on the ability of active investors to buy and sell in the market, such that the market is not a "free and open public" one; or (3) that the plaintiff would have made their purchase or sale at the affected price even knowing of the falsity of the alleged misrepresentation. This formulation is consistent with all controlling Supreme Court opinions.

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INTRODUCTION

Federal securities litigation¹ is a hotbed of junk science about market efficiency. It was not always so. It need not be the case going forward.

Securities litigation's fraud on the market presumption "says that all traders who purchase stock in an efficient market are presumed to have relied on the accuracy of a company's public statements."² Junk science entered securities litigation when courts applying the fraud on the market presumption embraced the ad hoc speculations of a federal district court in *Cammer v. Bloom*.³ The *Cammer* court was the first to set out a list of facts that—it asserted—would indicate an efficient market for the security at issue.⁴ Key facts to allege were:

1. large trading volume;⁵
2. a significant number of reports by securities analysts;⁶

¹ This Article focuses on securities litigation under Section 10(b) of the Securities Exchange Act of 1934, 15 U.S.C. § 78j(b) (2018), and the Securities and Exchange Commission's Rule 10b-5, 17 C.F.R. § 240.10b-5 (2018).

² *Wal-Mart Stores, Inc. v. Dukes*, 564 U.S. 338, 351 n.6 (2011). Professors Hu and Morley state the rationale for the presumption well:

This is why federal securities law has developed the so-called "fraud on the market" doctrine: even if an investor is not aware of a piece of information, she may nevertheless be said to have relied on it, because the information will inevitably influence the price at which an investor can buy or sell.

Henry T. C. Hu & John D. Morley, *A Regulatory Framework for Exchange-Traded Funds*, 91 S. CAL. L. REV. 839, 908 (2018). The fraud on the market theory has long been criticized by some securities scholars. *See generally, e.g.*, William W. Bratton & Michael L. Wachter, *The Political Economy of Fraud on the Market*, 160 U. Penn. L. Rev. 69 (2011) (arguing that fraud on the market class actions lack academic support). However, the fraud on the market theory has generally stood the test of time. *See* James Cameron Spindler, *We Have a Consensus on Fraud on the Market—and It's Wrong*, 7 HARV. BUS. L. REV. 67, 69–73 (2017) (evaluating and rejecting critiques). This is likely because there is no other effective way to provide deterrence against corporate fraud in modern securities markets. *Cf.* Antonio E. Bernardo et al., *A Theory of Legal Presumptions*, 16 J.L. ECON. & ORG. 1, 26, 39 (2000) (arguing that legal presumptions balance the social costs of redistributive litigation with the need for deterrence).

³ 711 F. Supp. 1264, 1276 (D.N.J. 1989).

⁴ *Id.* at 1286.

⁵ *Id.*

⁶ *Id.*

3. the presence of market-makers and arbitrageurs in the security;⁷
4. eligibility of the issuer to file an S-3 registration statement;⁸ and
5. a history of immediate stock⁹ price movements in response to unexpected corporate events and financial releases.¹⁰

Since these so-called “*Cammer* factors” came into play, another federal district court added three more factors—(1) the capitalization of the company; (2) the bid-ask spread of the stock; and (3) the percentage of stock not held by insiders.¹¹ Alas, none of these factors had—or have today—*any* support in the vast body of research on efficient markets as methods of distinguishing efficient from inefficient prices.¹² When they get us to the right

⁷ *Id.* at 1286–87.

⁸ *Id.* at 1287.

⁹ Much litigation, and much discussion of the fraud on the market presumption, focuses on stocks rather than other securities. The best evidence strongly suggests, however, that the markets for bonds and options are at least equally efficient. *See, e.g.*, Michael Hartzmark et al., *Fraud on the Market: Analysis of the Efficiency of the Corporate Bond Market*, 2011 COLUM. BUS. L. REV. 654, 656 (2011) (analyzing bond market efficiency and criticizing the decision of the court in *In re Am. Int'l Group, Inc. Sec. Litig. (AIG)*, 265 F.R.D. 157, 161 (S.D.N.Y. 2010) (finding the bond market inefficient for one of the world's largest companies)); Edith S. Hotchkiss & Tavy Ronen, *The Informational Efficiency of the Corporate Bond Market: An Intraday Analysis*, 15 REV. FIN. STUD. 1325, 1352 (2002) (finding bonds as efficiently priced as their same-company stocks).

¹⁰ *Cammer*, 711 F. Supp. at 1287.

¹¹ *Krogman v. Sterritt*, 202 F.R.D. 467, 474 (N.D. Tex. 2001).

¹² Financial economists have argued before that at least some of the *Cammer* factors are unconnected to financial economic research, but this prior work has not traced the doctrinal introduction of the factors, examined each systematically against the financial economic evidence, or proposed that they should all be abandoned. *See* Brad M. Barber et al., *The Fraud-on-the-Market Theory and the Indicators of Common Stocks' Efficiency*, 19 J. CORP. L. 285, 290 (1994) (“The various market efficiency criteria applied so far by courts are ad hoc. We know of no systematic body of evidence showing that these or any other criteria distinguish between efficient and inefficient stocks. Nor are we aware of evidence supporting specific cutoff values of these criteria.”) I pointed this out with Alon Brav in Alon Brav & J.B. Heaton, *Market Indeterminacy*, 28 J. CORP. L. 517, 535 (2003) (“The use of efficient markets theory in many reported cases is inexpert at best, erratic at worst. This inconsistent nature of

answer it is usually just because the *Cammer* factors are proxies for being a big, publicly traded company and such companies are almost always traded in an efficient market.¹³ When they fail, it is because they give courts too much flexibility to find inefficiency where it almost surely does not exist.¹⁴

The *Cammer* court lifted its factors willy-nilly from an expert affidavit of a securities law professor (not a financial economist)

efficient markets evidence in reported cases is perhaps unsurprising since the ‘science’ supporting an ability to distinguish efficient and inefficient markets for litigation purposes is highly suspect.”). A number of legal commentators have recognized the lack of connection between the *Cammer* factors and financial economics. *See also* James D. Cox, *Fraud on the Market After Amgen*, 9 DUKE J. CONST. L. & PUB. POL’Y 1, 15 (2013):

[T]here is nothing in the EMH holding that investors react differently in trading publicly traded stocks that are within the *Cammer* factors than how they react when trading in publicly traded shares of stocks in smaller capitalization issuers that do not meet all the *Cammer* factors.

Allen Ferrell & Andrew Roper, *Price Impact, Materiality, and Halliburton II*, 93 WASH. U. L. REV. 553, 558 (2015) (“The finance literature does not support viewing the first four *Cammer* factors as formulated and applied as constituting a reliable test for establishing semi-strong form market efficiency as they are commonly invoked prior to class certification. The fifth *Cammer* factor (a cause-and-effect relationship between public news and changes in stock price) can provide a more reliable indication of market efficiency when properly evaluated. However, courts’ understanding of what constitutes a reliable indication can vary substantially between cases and between courts.”); Mukesh Bajaj et al., *Assessing Market Efficiency for Reliance on the Fraud-On-The-Market Doctrine After Wal-Mart and Amgen*, THE LAW AND ECONOMICS OF CLASS ACTIONS 161, 183 (James Langenfeld ed., 2014) (criticizing the *Cammer* factors); Lucian A. Bebchuk & Allen Ferrell, *Rethinking Basic*, 69 BUS. L. 671, 675 (2014) (arguing for the elimination of “the current exclusive focus on the *Cammer* factors”). One commentator has argued “that the *Cammer* factors are profoundly flawed” but asserts without evidence that they “are likely biased to finding a higher degree of efficiency than actually exists.” Joseph A. Grundfest, *Damages and Reliance Under Section 10(b) of the Exchange Act*, 69 BUS. L. 307, 378 (2014). Professor Grundfest is wrong; the *Cammer* factors are almost surely biased *against* finding efficiency where it exists, a fact best evidenced by cases finding inefficiency for securities that almost any (disinterested) financial economist would characterize as efficient.

¹³ *See* David Tabak, *Testing Securities Market Efficiency With Cammer Factors*, LAW360 (Feb. 5, 2019, 2:45 PM), <https://www-law360-com.proxy.wm.edu/articles/1125546/testing-securities-market-efficiency-with-cammer-factors> [<https://perma.cc/3HZ7-AZ2W>].

¹⁴ Brad M. Barber et al., *The Fraud-on-the-Market Theory and the Indicators of Common Stocks’ Efficiency*, 19 J. CORP. L. 285, 290 (1994).

submitted by the plaintiff,¹⁵ supplemented with citations to the speculations of two other securities lawyers (one a professor,¹⁶ one a practitioner,¹⁷ neither a financial economist) in a securities treatise.¹⁸ None of these factors were anchored in the social science of efficient markets research.¹⁹ Nevertheless, the *Cammer* factors quickly became a mainstay of class-action securities fraud litigation. The lure of lucrative expert witness testimony led trained financial economists who surely knew better—and sometimes admitted they did²⁰—to apply them in court. Reported opinions are filled with painstaking analyses of these factors,²¹

¹⁵ *Cammer*, 711 F. Supp. 1264, 1287 (D.N.J. 1989) (“While the Amended Complaint does not contain most of the foregoing types of allegations, the Poser Affidavit does.”). The expert was Norman Poser, then professor of law at Brooklyn Law School. Paul A. Ferrillo et al., *The “Less Than” Efficient Capital Markets Hypothesis: Requiring More Proof from Plaintiffs in Fraud-on-the-Market Cases*, 78 ST. JOHN’S L. REV. 81, 129 n.115 (2004) (citing Aff. of Norman Poser, *Cammer v. Bloom*, 711 F. Supp. 1264 (D.N.J. 1989)).

¹⁶ Alan R. Bromberg was professor of law at Southern Methodist University School of Law. *\$2 Million Gift From Wife of Late SMU Professor Alan Bromberg*, SMU (Dec. 18, 2015), <https://www.smu.edu/News/2015/alan-r-bromberg-gift-18-dec2015> [<https://perma.cc/3DUZ-3BG8>].

¹⁷ Lewis D. Lowenfels practiced securities law in New York City. *Lewis D. Lowenfels Esq.*, L. OFF. LEWIS D. LOWENFELS, <http://www.tolinslowenfels.com/LLD.html> [<https://perma.cc/YVR7-V9JK>].

¹⁸ *Cammer*, 711 F. Supp. at 1286 (citing Bromberg & Lowenfels, 4 Securities Fraud and Commodities Fraud, § 8.6 (Aug. 1988)).

¹⁹ See *infra* Section I.B.

²⁰ *Willis v. Big Lots, Inc.*, No. 2:12-CV-604, 2017 WL 1074048, at *3 (S.D. Ohio Mar. 17, 2017) (“Defendants, through their expert Dr. Paul Gompers (‘Dr. Gompers’), contest the usefulness of the *Cammer* factors for determining market efficiency, asserting that accepted academic literature does not find the first four *Cammer* factors relevant to a determination of market efficiency.”); Ferrell & Roper, *supra* note 12, at 558 (“Courts have adopted a number of factors, most prominently the well-known *Cammer* and *Krogman* factors, to assess the efficiency of the market for a security for class certification purposes. These court-adopted factors can often effectively prevent defendants from successfully challenging market efficiency for class certification purposes even though these court-adopted factors have not been shown to provide a reliable test of market efficiency using commonly accepted econometric methods in the literature.”).

²¹ Very recent examples including the following: *Angley v. UTI Worldwide Inc.*, 311 F. Supp. 3d 1117, 1120–27 (C.D. Cal. 2018); *In re Banc of California Sec. Litig.*, 326 F.R.D. 640, 648–50 (C.D. Cal. 2018), leave to appeal denied sub nom; *Garcia v. Banc of California, Inc.*, No. 18-80068, 2018 WL 4474393 (9th Cir. Sept. 19, 2018); *City of Cape Coral Mun. Firefighters’ Ret. Plan v.*

none of which explain anything about the question at hand: was the market for this security efficient in the sense required by the fraud on the market presumption?

What is especially strange about this state of affairs—and also indicative of the way out—is that such detailed inquiry into the nature of a securities market was unnecessary. The earliest fraud on the market cases²² did not invoke the efficient markets

Emergent Biosolutions, Inc., HQ, 322 F. Supp. 3d 676, 687–90 (D. Md. 2018); *Wilson v. LSB Indus., Inc.*, No. 15CIV7614RAGWG, 2018 WL 3913115, at *9–*16 (S.D.N.Y. Aug. 13, 2018); *Menaldi v. Och-Ziff Capital Mgmt. Grp. LLC*, 328 F.R.D. 86, 96 (S.D.N.Y. 2018). The result of this focus on the *Cammer* factors is a large part of litigation for class certification. See Kevin S. Haeberle & M. Todd Henderson, *A New Market-Based Approach to Securities Law*, 85 U. CHI. L. REV. 1313, 1355 (2018):

The result is a kind of dystopian judicial proceeding in which the plaintiffs’ lawyers and defense lawyers argue their entire case at a point in the litigation when little is known, focusing on things like market efficiency, and real issues about the appropriate scope of the litigation to serve its compensation and deterrence ends are largely ignored.

Tara E. Levens, *Too Fast, Too Frequent? High-Frequency Trading and Securities Class Actions*, 82 U. CHI. L. REV. 1511, 1521 (2015):

In determining market efficiency, most courts rely on the factors laid out in *Cammer*: the average weekly trading volume, the number of analysts following the stock, the number of market makers and arbitrageurs, the issuing company’s eligibility to file a Form S-3 registration statement, and the cause-and-effect relationship between corporate events or financial releases and the stock price. Courts disagree about whether all of these factors must be satisfied, which are the most important, which should be the most heavily weighted, and what the appropriate thresholds are for satisfying each factor.

²² The term “fraud on the market” first appears in a reported case, the 1969 opinion of the United States District Court for the Southern District of New York, *Herbst v. Able*, 47 F.R.D. 11, 16 (S.D.N.Y. 1969), amended, 49 F.R.D. 286 (S.D.N.Y. 1970). See Andrew C. Baker, *Single-Firm Event Studies, Securities Fraud, and Financial Crisis: Problems of Inference*, 68 STAN. L. REV. 1207, 1216 (2016) (citing *Herbst v. Able*, 47 F.R.D. 11, 16 (S.D.N.Y. 1969); *Blackie v. Barrack*, 524 F.2d 891, 906 (9th Cir. 1975)) (“The FOTM theory was first adopted by the District Court for the Southern District of New York in 1969 and by the Ninth Circuit Court of Appeals in 1975.”). The term is credited to Abe Pomerantz’s firm then known as Pomerantz, Levy, Haudek & Block, which represented the *Herbst* plaintiffs. See Marc I. Gross, *The Road Map for Class Certification Post-Halliburton II*, 46 LOY. U. CHI. L.J. 485 (2015) (“The concept that defendants’ misrepresentations create a ‘fraud on the market’ (‘FOM’) was first coined nearly fifty years ago by Abe Pomerantz, the

hypothesis. Courts instead embraced the fraud on the market presumption on the premise that Congress intended in the Securities Exchange Act of 1934 to provide “a means by which investors may recover against market manipulators in federal court.”²³ One way to manipulate a market was to make material misrepresentations that would cause some traders—but not necessarily the plaintiffs—to transact at different prices than they would have transacted without the material misrepresentation. A manipulator’s misrepresentations comprised two deceptions: one contained in the untrue representation and one in the form of the artificial price the misrepresentation caused.²⁴ Because of the “causal nexus’ between the alleged misstatements and an inflated price[,]”²⁵ a plaintiff was “misled ... as to the fair market value of the stock”²⁶ and protected by securities law unless he would have traded anyway even knowing of the false representation.²⁷ In these cases,

pioneer of shareholder rights litigation, in *Herbst v. Able*.”) The *Herbst* decision was especially well-suited to a presumption that investors relied on an artificially created price because the case involved the conversion of debt into common stock. The conversion became more attractive at the allegedly inflated price. Interestingly, the number of Rule 10b-5 class action filings increased substantially in 1970. See Paul G. Mahoney, *The Development of Securities Law in the United States*, 47 J. ACCT. RES. 325, 334 (2009) (presenting evidence on the increase in Rule 10b-5 filings). Whether this can be explained by the *Herbst* decision remains for future study.

²³ *In re Memorex Sec. Cases*, 61 F.R.D. 88, 99 (N.D. Cal. 1973). Of course, what exactly Congress intended in Section 10(b) of the Securities Exchange Act of 1934 has long been discussed and contested. See, e.g., Steven Thel, *The Original Conception of Section 10(b) of the Securities Exchange Act*, 42 STAN. L. REV. 385, 385 (1990) (analyzing Congressional intent with respect to Section 10(b)).

²⁴ In essence, the early cases recognized what later scholars have recognized as well: that misrepresentations can distort price—or not—whether or not the markets themselves are perfect in the economists’ sense. See, e.g., Bebchuk & Ferrell, *supra* note 12, at 671 (arguing for the unimportance of market efficiency in determining fraudulent price distortion).

²⁵ *In re Memorex Sec. Cases*, 61 F.R.D. at 100.

²⁶ *Rifkin v. Crow*, 574 F.2d 256, 263 (5th Cir. 1978).

²⁷ *Blackie*, 524 F.2d 891, 907 (9th Cir. 1975).

Requiring direct proof from each purchaser that he relied on a particular representation when purchasing would defeat recovery by those whose reliance was indirect, despite the fact that the causal chain is broken only if the purchaser would have purchased the stock even had he known of the misrepresentation. We decline to leave such open market purchasers unprotected.

all that was required was that the market for the security at issue be “free and open.”²⁸ Appealing to efficient markets theory for support was gilding the lily. Quickly, however, the supportive social science that was meant as icing on the cake became all that mattered.

But here is the cold, hard reality: the *Cammer* factors and the three others added later—even the oft-praised fifth *Cammer* factor (a history of immediate stock price movements in response to unexpected corporate events and financial releases)²⁹—cannot determine whether the market for a security at issue in securities fraud litigation trades in an efficient market. If tested efficiency is necessary for use of the fraud on the market presumption—and it is not clear it should be³⁰—then there is only one test that

The statute and rule are designed to foster an expectation that securities markets are free from fraud an expectation on which purchasers should be able to rely.

Id.

²⁸ Crane Co. v. Westinghouse Air Brake Co., 419 F.2d 787, 793 (2d Cir. 1969).

²⁹ Courts and commentators often assert that the fifth *Cammer* factor is most important or most related to market efficiency. Simpson v. Specialty Retail Concepts, 823 F. Supp. 353, 355 n.6 (M.D.N.C. 1993) (“The fifth *Cammer* factor is perhaps the most important one.”); Bradford Cornell, *Market Efficiency and Securities Litigation: Implications of the Appellate Decision in Thane*, 6 VA. L. & BUS. REV. 237, 245 n.22 (2011) (“The fifth *Cammer* factor, the reaction of the stock price to unexpected news events, is a direct measure of efficiency.”); Bradford Cornell & John Haut, *How Efficient Is Sufficient: Applying the Concept of Market Efficiency in Litigation*, 74 BUS. L. 417, 421 (2019) (“Only one of the *Cammer* and *Krogman* criteria speaks to a direct assessment of efficiency that is amenable to scientific quantification—the speed with which security prices respond to information, in other words informational efficiency.”) This might be correct if applied as stated, but the analysis in fact turns on whether price reactions are “statistically significant,” a requirement that renders the examination of price reactions unreliable for determining efficiency.

³⁰ The case for the unimportance of market efficiency for the policies behind the fraud on the market presumption is set out in Jonathan R. Macey, Geoffrey P. Miller, Mark L. Mitchell & Jeffrey M. Netter, *Lessons from Financial Economics: Materiality, Reliance, and Extending the Reach of Basic v. Levinson*, 77 VA. L. REV. 1017, 1018 (1991) (“We suggest that the focus of the Supreme Court’s holding in *Basic* is misplaced: what determines whether investors were justified in relying on the integrity of the market price is not the efficiency of the relevant market but rather whether a misstatement distorted the price of the affected security.”).

has significant probative value and is generally accepted: a security-specific test (potentially made up of several possible subtests) for actionable (trading-relevant) return predictability in the security.³¹ It is a test that is consistent with a statement of the United States Court of Appeals for the First Circuit “that market price responds so quickly to new information that ordinary investors cannot make trading profits on the basis of such information.”³² This is a test on which most financial economists agree.³³

What is *not* reliable are the tests currently used, the most deceptive of which is the so-called *Cammer* “fifth factor”: examining the history of price reactions or non-reactions to news for statistical significance.³⁴ The errors in the interpretation of this sort of evidence ought to be the subject of an introductory college statistics class, but instead these interpretive errors shape the outcome of multimillion- (and multibillion-) dollar litigation.³⁵ News need not cause a statistically significant price reaction, because statistical significance is simply a measure of the *relative size* of the price impact; the actual efficient-market impact may be smaller than that measure. Conversely, the existence of a statistically significant price impact does not imply the need for some observable news event, since efficient prices can move for reasons that are unobservable. Pretending otherwise is nothing short of a fraud on the court.³⁶

Perhaps the greatest embarrassment of the junk science in securities litigation is the mutual complicity of plaintiffs and defendants in continuing it. Rather than stand firm and challenge the lack of foundational reliability behind the *Cammer* factors, plaintiffs have pursued them with vigor. It was a set of plaintiffs, after all, who first offered the affidavit in support of those factors.³⁷ Defendants at first cherry picked unmet factors and

³¹ See *In re Poly Medica Corp. Sec. Litig.*, 432 F.3d 1, 19 (1st Cir. 2005).

³² *Id.*

³³ *Id.*

³⁴ Daniel Bettencourt & Steven Feinstein, *What a Solar Eclipse Has to Do with Market Efficiency*, LAW 360, 1, 2–3 (Nov. 17, 2017).

³⁵ *Id.*

³⁶ A note to the courts: if you are judging whether a market is efficient by looking for statistically significant price reactions, you are doing it wrong. See, e.g., *Hatamian v. Advanced Micro Devices, Inc.*, No. 14-CV-00226 YGR, 2016 WL 1042502, at *7 (N.D. Cal. Mar. 16, 2016) (“[L]ack of a statistically significant price increase does not necessarily equate to lack of price impact.”).

³⁷ See Ferrillo et al., *supra* note 15, at 106.

argued that the market was inefficient if not all the factors were present. Ultimately, however, the defendants and their paid experts seized on the most nonsensical (and most exploitable) factor—the *Cammer* fifth factor—and argued that absence of statistically significant price moves indicated inefficiency, never admitting that this interpretation was illogical and intellectually dishonest.³⁸ Since plaintiffs at times benefitted from this factor when statistical significance *was* present, a strange equilibrium of agreement to apply junk science emerged.³⁹

Part I traces the use of the efficient markets hypothesis in fraud on the market cases from a means of bolstering existing precedent for the reliability of a “free and open public market[]” to the assumption that efficiency was a necessary prerequisite to the presumption.⁴⁰ While the United States Supreme Court in *Basic v. Levinson*⁴¹ did not state explicitly that efficiency in the sense the term is used in financial economics was necessary for the application of the fraud on the market presumption, the implicit suggestion remained⁴² and some language in later cases from the Court is consistent with such a requirement.⁴³ Combined with

³⁸ See, e.g., *Krogman v. Sterritt*, 202 F.R.D. 467, 477 (N.D. Tex. 2001).

³⁹ As a lawyer and financial economist, my own domain-specific knowledge is limited, but one must wonder in what other parts of litigation such an equilibrium has emerged.

⁴⁰ See *infra* Part I.

⁴¹ 485 U.S. 224 (1988).

⁴² This view is summed up well by *In re Sahlen & Assocs., Inc. Sec. Litig.*, 773 F. Supp. 342, 356 (S.D. Fla. 1991).

While the Supreme Court in *Basic* did not explicitly approve the Sixth Circuit’s requirement that ‘a plaintiff must allege and prove ... that the shares were traded on an efficient market,’ ... courts have interpreted the Court’s discussion of the lower court opinion as implicitly approving of this requirement. See, e.g., *Freeman v. Laventhol & Horwath*, 915 F.2d 193, 197–98 (6th Cir. 1990); *Greenberg v. Boettcher & Co.*, 755 F. Supp. 776, 781 (N.D. Ill. 1991); *Cammer v. Bloom*, 711 F.Supp. 1264, 1285 n.34 (D.N.J. 1989); *Stinson v. Van Valley Development Corp.*, 714 F. Supp. 132, 135 (E.D. Pa. 1989), *aff’d*, 897 F.2d 524 (3d Cir. 1990).

Id. at 356 n.18 (citations omitted).

⁴³ See, e.g., *Erica P. John Fund, Inc. v. Halliburton Co.*, 563 U.S. 804, 811 (2011) (quoting *Basic Inc. v. Levinson*, 484 U.S. 224 (1988)) (“It is undisputed that securities fraud plaintiffs must prove certain things in order to invoke

the momentum of existing fraud on the market case law before *Basic*, efficiency in the sense of financial economics became a required allegation in fraud on the market cases.⁴⁴ *Cammer* was the first case post-*Basic* to offer a structured list of allegations that might be sufficient, and courts adopted that list with little thought or analysis, encouraged, perhaps, by the embrace of the factors by the expert witnesses who came before them.⁴⁵

Part II explains why the *Cammer* factors are junk science. Put simply, none of the *Cammer* factors (nor the additional factors added since) help establish whether the market for a security at issue is efficient in the sense of financial economics. The Article first explains how financial economists actually test for market efficiency. It is not by way of anything resembling the *Cammer* factors. The Article then explains why the *Cammer* factors and the additional factors are not useful for determining this sort of efficiency of the market for a security at issue in securities fraud litigation.

Part III argues for securities litigation without junk science through a return to the common sense approach of the earliest fraud on the market cases: if a security trades in a free and open public market, then it is, in the sense of controlling Supreme Court precedent, “efficient” and plaintiffs should be able to invoke the (rebuttable) fraud on the market presumption. The *Cammer* factors remain unhelpful in making this determination. What is important to the determination of a “free and open public market” is the ability of active investors—investors other than passive funds that will buy or sell according to index inclusion or the like—to buy and sell in the market. This includes the determination whether there are substantial restrictions on participation like substantial lockups of potential sellers or bans on short

Basic’s rebuttable presumption of reliance. It is common ground, for example, that plaintiffs must demonstrate that the alleged misrepresentations were publicly known (else how would the market take them into account?), that the stock traded in an efficient market, and that the relevant transaction took place ‘between the time the misrepresentations were made and the time the truth was revealed.’”).

⁴⁴ See, e.g., *Cammer v. Bloom*, 711 F. Supp. 1261, 1281 (D.N.J. 1989).

⁴⁵ See, e.g., *Kelley v. Mid-Am. Racing Stables, Inc.*, 139 F.R.D. 405, 409 (W.D. Okla. 1990).

selling. This approach is hardly anachronistic. Public markets that are free and open are necessarily subject to the profit-seeking of speculators, or so-called arbitrageurs.⁴⁶ An enormous amount of capital chases profit opportunities in the smallest of crevices, from life insurance policy acquisition to litigation funding to gold and silver coins to, of course, securities.⁴⁷ The idea that a public market for a security is not subject to the scrutiny and trading of speculators is usually facially implausible absent evidence of substantial limits on their trading.⁴⁸ I propose that plaintiffs be allowed to allege the existence of such free and open public markets and defendants be allowed two possible showings at the class certification stage to rebut the availability of the fraud on the market presumption. First, as exists now, an opportunity to show no price impact, though this must be done without the use of junk science single-firm event studies.⁴⁹ Second, an opportunity

⁴⁶ Arthur E. Foulkes, *Speculators important in free markets*, TRIBUNE STAR (June 20, 2008), https://www.tribstar.com/news/business_news/arthur-foulkes-speculators-important-in-free-markets/article_709e0232-d741-5525-a746-83c0d1545992.html [<https://perma.cc/LNH3-HNE8>].

⁴⁷ Cary Martin, *Private Investment Companies in the Wake of the Financial Crisis: Rethinking the Effectiveness of the Sophisticated Investor Exemption*, 37 DEL. J. CORP. L. 49, 49 (2012).

⁴⁸ *Id.* at 87.

⁴⁹ See Alon Brav & J.B. Heaton, *Event Studies in Securities Litigation: Low Power, Confounding Effects, and Bias*, 93 WASH. U. L. REV. 583 (2015) (discussing the unreliability of single-firm event studies). This work has become influential in the courts, leading the most astute courts to reject the need for event studies in securities litigation. See *In re EZCORP, Inc. Sec. Litig.*, No. 19-90006, 2019 WL 1428008 (5th Cir. Mar. 25, 2019); *In re Petrobras Sec.*, 862 F.3d 250, 278 (2d Cir. 2017) (citing Brav & Heaton, *supra*, at 584–608) (“Event studies offer the seductive promise of hard numbers and dispassionate truth, but methodological constraints limit their utility in the context of single-firm analyses.”); *Rooney v. EZCORP, Inc.*, 330 F.R.D. 439, 450 (W.D. Tex. 2019) (citing Brav & Heaton, *supra*, at 602) (“A statistically significant price adjustment following a corrective disclosure is evidence the original misrepresentation did, in fact, affect the stock price. The converse, however, is not true—the absence of a statistically significant price adjustment does not show the stock price was unaffected by the misrepresentation.”); *Pirnik v. Fiat Chrysler Automobiles, N.V.*, 327 F.R.D. 38, 46 (S.D.N.Y. 2018) (quoting Brav & Heaton, *supra*, at 593) (“With respect to the latter point, however, it is Defendants’ burden to show, by a preponderance of the evidence, the absence of price impact, and they cannot meet that burden by pointing to a handful of dates and suggesting, without further explanation, that one should have seen price impact on those dates but did not. As for the former, ‘statistical significance

to show that the market is, in fact, not a free and open public market in the sense that there are substantial limitations on buyers and sellers that do not allow their free interaction. At the merits stage, defendants should also, of course, be able to show that any particular plaintiff would have made their purchase or sale at the affected price even knowing of the falsity of the alleged misrepresentation. This formulation is consistent with all controlling Supreme Court opinions. It is implementable today.

I. EFFICIENT MARKETS AND THE ROAD TO *CAMMER*

A. *Fraud on the Market, B.C.—Before Cammer*

Early fraud on the market cases⁵⁰ made a modest demand of securities markets: that market prices be “validly set”⁵¹ in the

is simply describing a set of returns that would be unusual to observe if there was no price impact.”); *Carpenters Pension Tr. Fund of St. Louis v. Barclays PLC*, 310 F.R.D. 69, 85 (S.D.N.Y. 2015) (Brav & Heaton, *supra*, at 584) (“In academic research, event studies are almost exclusively conducted with large samples of securities from a number of different firms. When the event study is used in a litigation to examine a single firm, the chances of finding statistically significant results decrease dramatically.”).

⁵⁰ There were almost two decades of fraud on the market litigation before the Supreme Court’s decision in *Basic*, something even the best of students often miss:

Before *Basic*, securities-fraud plaintiffs suing as a class could usually establish the “reliance” element only by showing that each class member was aware of and traded a security based on a specific falsehood. This requirement thwarted most attempts to bring 10b-5 class actions, because individual issues of reliance almost always eclipsed class-wide issues, preventing the action from moving forward under Federal Rule of Civil Procedure 23(b)(3). The Court’s 4–2 decision in *Basic*, however, upended the existing individual-reliance regime and modified the private 10b-5 action to allow securities-fraud class actions to proceed.

See Note, *Congress, the Supreme Court, and the Rise of Securities-Fraud Class Actions*, 132 HARV. L. REV. 1067, 1069 (2019) (citations omitted). This is flat wrong. Even some securities scholars gloss over the overwhelming adoption of fraud on the market in the lower courts prior to *Basic*:

The complexity of the reliance issue became more apparent, however, when the Court returned to the issue fifteen years later. The logic of *Affiliated Ute*’s presumption of reliance did not cover affirmative misstatements, so the obstacle that reliance creates for class certification remained in those cases. The Court

absence of manipulation. Courts had long accepted the reliability of securities market pricing in other contexts, most notably shareholder appraisal cases.⁵² In a 1948 decision of New York's Appellate Division involving the appraisal of shares of R.H. Macy & Co., the court observed "that market value is the controlling consideration where there is a free and open market and the volume of transactions and conditions make the market a fair reflection of the judgment of the buying and selling public."⁵³ The idea was only that the market price reflected the thinking of a variety of investors about a variety of matters.⁵⁴ As another New York opinion put it in 1952: "The bases for optimism and pessimism on the part of investors, and their reactions thereto, cause some to buy and others to sell. That is what creates a market, and the

in *Basic Inc. v. Levinson*, urged on by the SEC, and with Justice Blackmun again writing for the majority, effectively completed the dismantling of the reliance requirement by adopting the 'fraud-on-the-market' presumption of reliance.

A.C. Pritchard, *Halliburton II: A Loser's History*, 10 DUKE J. CONST. L. & PUB. POL'Y 27, 33 (2015). Professor Fisch, among others, has pointed out this ongoing misunderstanding:

Many commentators cite *Basic* as the foundation of modern securities fraud litigation. *Basic* did not reflect, however, a doctrinal shift. From the earliest cases addressing the implied private right of action under section 10(b) of the Securities Exchange Act and SEC Rule 10b-5, the lower courts recognized that it was impractical to impose a reliance requirement in federal securities fraud litigation. Commentators similarly questioned the theoretical premise for requiring proof of reliance.

Jill E. Fisch, *The Trouble with Basic: Price Distortion After Halliburton*, 90 WASH. U. L. REV. 895, 900 (2013) (citations omitted).

⁵¹ *Blackie v. Barrack*, 524 F.2d 891, 907-08 (9th Cir. 1975) stating the purchaser:

relies generally on the supposition that the market price is validly set and that no unsuspected manipulation has artificially inflated the price, and thus indirectly on the truth of the representations underlying the stock price whether he is aware of it or not, the price he pays reflects material misrepresentations.

The *Blackie* court considered it "common sense that a stock purchaser does not ordinarily seek to purchase a loss in the form of artificially inflated stock." *Id.* at 908.

⁵² See Application of Marcus, 273 A.D. 725, 727 (N.Y. App. Div. 1948).

⁵³ *Id.*

⁵⁴ *Id.*

market measures the value where, as here, it is free and open.”⁵⁵ Bayless Manning would write in 1962 of shareholder appraisal actions that “courts have virtually refused to go beyond an inquiry as to the market price on the date determined to be relevant.”⁵⁶

When the matter at hand became securities fraud under the Exchange Act instead of state law share appraisals⁵⁷ and

⁵⁵ Application of Deutschmann, 281 A.D. 14, 22 (N.Y. App. Div. 1952). Interestingly, it took some time for financial economists to begin serious study of such disagreement in financial markets. Early work on the topic includes: George M. Constantinides, *Intertemporal Asset Pricing with Heterogeneous Consumers and without Demand Aggregation*, 55 J. BUS. 253 (1982); Milton Harris & Artur Raviv, *Differences of Opinion Make a Horse Race*, REV. FIN. STUD. 473 (1993); Mark Rubinstein, *An Aggregation Theorem for Securities Markets*, 1 J. FIN. ECON. 225 (1974); Hal R. Varian, *Divergence of Opinion in Complete Markets: A Note*, 40 J. FIN. 309 (1985). Much recent research focuses on disagreement and its effects in financial markets. *See generally, e.g.*, Adem Atmaz & Suleyman Basak, *Belief Dispersion in the Stock Market*, 73 J. FIN. 1225 (2018) (modeling belief dispersion and its impact on returns, volatility, and volume); Bruce I. Carlin, Francis A. Longstaff & Kyle Matoba, *Disagreement and Asset Prices*, 114 J. FIN. ECON. 226 (2014) (studying the effect of differences of opinion on asset prices). Almost 25 years ago, Professor Stout argued for the importance of heterogeneous expectations in the legal understanding of securities markets. Lynn A. Stout, *Are Stock Markets Costly Casinos? Disagreement, Market Failure, and Securities Regulation*, 81 VA. L. REV. 611, 615–17 (1995).

⁵⁶ Bayless Manning, *The Shareholder’s Appraisal Remedy: An Essay for Frank Coker*, 72 YALE L.J. 223, 232 (1962).

⁵⁷ Interestingly, share appraisals today often reject market pricing in favor of a battle of experts with input from sitting judges as well, especially in Delaware where the use of market evidence has become nothing less than erratic. *See, e.g.*, Verition Partners Master Fund Ltd. v. Aruba Networks, Inc., 210 A.3d 128, 140 (Del. 2019) (reversing lower court’s use of the unaffected pre-merger market price in favor of discounted cash flow valuation-based appraisal); Dell, Inc. v. Magnetar Glob. Event Driven Master Fund Ltd., 177 A.3d 1, 24 (Del. 2017) (“Further, the Court of Chancery’s analysis ignored the efficient market hypothesis long endorsed by this Court. It teaches that the price produced by an efficient market is generally a more reliable assessment of fair value than the view of a single analyst, especially an expert witness who caters her valuation to the litigation imperatives of a well-heeled client.”); DFC Glob. Corp. v. Muirfield Value Partners, L.P., 172 A.3d 346, 369–70 (Del. 2017) (“Market prices are typically viewed superior to other valuation techniques because, unlike, e.g., a single person’s discounted cash flow model, the market price should distill the collective judgment of the many based on all the publicly available information about a given company and the value of its shares.”); *In re Appraisal of Solera Holdings, Inc.*, No. CV 12080-CB, 2018 WL 3625644, at *34 (Del. Ch. July 30, 2018), judgment entered (Del. Ch.

courts sought a way to allow securities fraud plaintiffs to avail themselves of the class action procedure,⁵⁸ all that was required for fraud on the market theory was a recognition that traders setting prices of securities at issue could be influenced by misinformation and, as a result, transact at prices reflecting the misinformation.⁵⁹ An early court used the term “[t]he artificially inflated market price theory”⁶⁰ instead of “fraud on the market

2018) (rejecting pre-merger announcement closing price as the best evidence of fair value of shares).

⁵⁸ The earliest cases allowing class actions did not consider the fraud on the market presumption but instead contemplated the possibility that the trial court could order individual trials on reliance. *See, e.g.*, *Green v. Wolf Corp.*, 406 F.2d 291, 301 (2d Cir. 1968) (citation omitted) (“We see no sound reason why the trial court, if it determines individual reliance is an essential element of the proof, cannot order separate trials on that particular issue, as on the question of damages, if necessary. The effective administration of 23(b)(3) will often require the use of the ‘sensible device’ of split trials.”).

⁵⁹ *See, e.g.*, *Carpenter v. Hall*, 311 F. Supp. 1099, 1111 (S.D. Tex. 1970) (characterizing fraud on the market as “a variety of ways and over a span of time the defendants concurred in wrongfully causing the market price of Westec stock on the American Stock Exchange to be higher than it would have been without such tortious conduct”). Commentators have traced judicial openness to the fraud on the market presumption to the decision of the United States Supreme Court in *Affiliated Ute Citizens of Utah v. United States*, 406 U.S. 128 (1972). *See Note, The Reliance Requirement in Private Actions Under Sec Rule 10b-5*, 88 HARV. L. REV. 584, 592–93 (1975) (“Although *Affiliated Ute* emphasized the nondisclosure aspects of that case, the case of a plaintiff damaged by the effect of a deception on the open market may also justify a presumption of reliance once the materiality of the deceptive practice is established. When a deception allegedly caused damage by means of its impersonal effect on a securities market, proof of causation requires showing that the deception affected the market and that damage to the plaintiff resulted.”). The *Affiliated Ute* decision was quite different, however. There, the Supreme Court held that reliance was unnecessary in an omissions case if the facts would have been material to an investor. *Affiliated Ute Citizens of Utah*, 406 U.S. at 153–54.

Under the circumstances of this case, involving primarily a failure to disclose, positive proof of reliance is not a prerequisite to recovery. All that is necessary is that the facts withheld be material in the sense that a reasonable investor might have considered them important in the making of this decision.

Id.

⁶⁰ *In re U.S. Fin. Sec. Litig.*, 64 F.R.D. 443, 451 (S.D. Cal. 1974):

The artificially inflated market price theory makes it unnecessary to prove that each investor relied on the same misrepresentation. It is sufficient to show that there were different misrepresentations which were a part of a common scheme to

theory,” the former term better describing the nature of the cases by focusing on the incorrect price rather than anthropomorphizing the “market” as something capable of being defrauded like a person.⁶¹ The price impact on a free and open public market—which then was embedded in the price at which plaintiffs traded—is thus more akin to manipulation than fraud.⁶²

manipulate the price of the stock. The facts of the instant case fit this theory. It may develop that there is some variance between misrepresentations, but the misrepresentations taken as a whole appear part of an uninterrupted manipulation of the price over the alleged class period.

Id. See also *Werfel v. Kramarsky*, 61 F.R.D. 674, 681 (S.D.N.Y. 1974) (citing *Cohen v. Franchard Corp.*, 478 F.2d 115, 124 (2d Cir. 1973)) (“Moreover, we doubt that proof of actual reliance, as in a common law action for deceit, is necessary in a 10b-5 action for damages. Rather, what plaintiff must show is causation.”); *Reeder v. Mastercraft Elecs. Corp.*, 363 F. Supp. 574, 581 (S.D.N.Y. 1973) (citing Note, *Reliance Under Rule 10b-5: Is the “Reasonable Investor” Reasonable?*, 72 COL. L. REV. 562, 576 (1972)) (“Demonstrating reliance in open market situations such as here should not be necessary. Plaintiffs should be required only to demonstrate a material misstatement by defendants.”).

⁶¹ *In re U.S. Fin. Sec. Litig.*, 64 F.R.D. at 451.

⁶² See, e.g., Barbara Black, *The Strange Case of Fraud on the Market: A Label in Search of a Theory*, 52 ALB. L. REV. 923, 950 (1988) (“Fraud on the market, in some cases, is used as a synonym for market manipulation. The statement that a trader is entitled to rely on the integrity of the market is the equivalent of saying that a trader may suffer injury when the market or price for a stock is tampered with. Accordingly, he may have a claim against dealers that created an artificial price and an artificial market.”); Norman S. Poser, *Stock Market Manipulation and Corporate Control Transactions*, 40 U. MIAMI L. REV. 671, 716–17 (1986) (“It may be seen that the ‘fraud on the market’ theory is the first cousin, or possibly an even closer relative, of manipulation. Under both concepts, the causal line between the plaintiff’s harm and the defendant’s wrongdoing is not actual reliance on the defendant’s deceptive acts, but damage to the free market.”); see also *U.S. Commodity Futures Trading Comm’n v. S. Tr. Metals, Inc.*, 894 F.3d 1313, 1334 (11th Cir. 2018), cert. denied sub nom. *S. Tr. Metals, Inc. v. Commodity Futures Trading Comm’n*, 139 S. Ct. 1464 (2019) (“Teasing out the effect of market conditions in fraud-on-the-market cases is essential because the fraud alleged involves a manipulation of stock price.”). As a legal matter, however, market manipulation cases involve fraudulent transactions rather than misrepresentations. See *Cellular S. Inc. v. Merrill, Lynch, Pierce, Fenner & Smith, Inc.*, 516 F. App’x 30, 33 (2d Cir. 2013) (citation omitted) (“A complaint that raises a market manipulation claim must allege ... manipulative acts The gravamen of manipulation is deception of investors into believing that prices at which they purchase and sell securities are determined by the natural interplay of supply and demand, not rigged by manipulators.”). Securities fraud, as a concept, generates a number of other difficult-to-pin-down issues as well. For an analysis of many of these issues,

The efficient markets hypothesis did not find its way into reported fraud on the market litigation until 1980.⁶³ Just before, in a 1979 case arising under the Williams Act, the United States Court of Appeals for the Second Circuit, in *Seaboard World Airlines, Inc. v. Tiger International, Inc.*,⁶⁴ cited earlier case law for the proposition that the stock market prices of a New York Stock Exchange–traded stock were usually the best reflection of the factors that influenced valuation.⁶⁵ The court invoked the efficient markets hypothesis as *further* support for the reliability of such prices:

Underlying such an approach is the “efficient market theory,” which, briefly stated, is that in a free and actively traded market, absent compelling reasons to believe otherwise, the market price is held to take account of asset value as well as the other economic, political, and financial factors that determine “value.”⁶⁶

A year later came the first reported opinion *linking* the fraud on the market theory with the efficient markets hypothesis.⁶⁷ In a 1980 opinion from the Northern District of Texas, *In re LTV Securities Litigation*,⁶⁸ the district court invoked the efficient markets hypothesis to *support* the fraud on the market theory.⁶⁹ Fraud on the market—already the subject of more than a decade

see Samuel W. Buell, *What is Securities Fraud?*, 61 DUKE L.J. 511, 514–15 (2011) (analyzing the nature of securities fraud).

⁶³ See *In re LTV Sec. Litig.*, 88 F.R.D. 134, 144 (N.D. Tex. 1980). See also Robert B. Thompson, *Securities Regulation 2.0: An Essay in Honor of Don Langevoort*, 107 GEO. L.J. 795, 798 (2019) (“The efficient market theory that financial economists began developing in the mid-twentieth century made its way into securities law discussions by the early 1980s.”).

⁶⁴ 600 F.2d 355, 361 (2d Cir. 1979).

⁶⁵ *Id.* (citing *Mills v. Elec. Auto-Lite Co.*, 552 F.2d 1239, 1246–47 (7th Cir. 1977), *cert. denied*, 434 U.S. 922 (1977)).

⁶⁶ *Seaboard World Airlines, Inc. v. Tiger Int’l, Inc.*, 600 F.2d 355, 361–62 (2d Cir. 1979) (citations omitted). Cases taking the opposite view were rare. See, e.g., *Jones v. Nat’l Distillers & Chem. Corp.*, 484 F. Supp. 679, 683 (S.D.N.Y. 1979) (demonstrating where the United States District Court for the Southern District of New York largely rejected Seaboard’s embrace of stock market prices by allowing a mere expert affidavit from a Chartered Financial Analyst to create a fact issue as to whether the market value of the shares at issue—traded on the Pacific Stock Exchange—were reliable).

⁶⁷ See *In re LTV Sec. Litig.*, 88 F.R.D. 134, 144 (N.D. Tex. 1980).

⁶⁸ *Id.* The *LTV* decision would heavily influence the United States Supreme Court in *Basic Inc. v. Levinson*, 485 U.S. 224, 244 (1988).

⁶⁹ *Id.*

of judicial approval—was reasonable as an empirical matter because “economists have now amassed sufficient empirical data to justify a present belief that widely followed securities of larger corporations are ‘efficiently’ priced: the market price of stocks reflects all available public information—and hence necessarily, any material misrepresentations as well.”⁷⁰

This point is key: both of these courts—the *Seaboard* and *LTV* courts—invoked the efficient markets hypothesis to *add weight* to existing, sufficient precedent for accepting the reliability of securities prices in free and open public markets.⁷¹ Theirs was an appeal to the authority of a new social science of market efficiency to add heft to an already adequate argument.⁷² Securities market prices were reliable not only because common sense and the day-to-day reliance of investors on such prices suggested as much, but because researchers in an increasingly prominent social science said so.⁷³ Moreover, those academic researchers were disinterested, with no stake in the securities jurisprudence or the cases at hand.⁷⁴

Almost immediately, however, efficiency became more than an ancillary argument in favor of the reliability of securities prices. Soon, what started as an argument bolstering the reliability of securities market pricing effectively raised the bar on just how

⁷⁰ *Id.* at 144 (citing finance textbooks and a popular investment book).

⁷¹ Cf. Henry T. C. Hu, *Corporate Distress, Credit Default Swaps, and Defaults: Information and Traditional, Contingent, and Empty Creditors*, 13 BROOK. J. CORP. FIN. & COM. L. 5, 9 (2018) (“In the 1970s, the efficient market hypothesis (EMH) provided a social science foundation for the disclosure philosophy.”).

⁷² Efficient markets results entered legal commentary slowly at first. The first discussions of efficient market theory in law reviews appears to be Stephen Harvey E. Bines, *Modern Portfolio Theory and Investment Management Law: Refinement of Legal Doctrine*, 76 COLUM. L. REV. 721, 776 (1976) (“The obvious question raised by the efficient markets hypothesis is how legal doctrine should respond.”); B. Cohen, *The Suitability Rule and Economic Theory*, 80 YALE L.J. 1604, 1614 (1971) (analyzing suitability requirements in light of financial theory, including efficient markets theory); Walter Werner, *Adventure in Social Control of Finance: The National Market System for Securities*, 75 COLUM. L. REV. 1233, 1274 (1975) (“The term ‘efficient markets’ is generally employed by economists today to mean markets in which prices respond quickly to new information.”).

⁷³ See, e.g., Cohen, *supra* note 72, at 1614.

⁷⁴ *Id.*

reliable that market pricing must be: it must be *efficient*.⁷⁵ By 1982, one district court would claim: “Critical to the fraud-on-the-market theory is the assumption that market prices respond to information disseminated (or not disseminated).⁷⁶ This is sometimes referred to as an efficient market.”⁷⁷ Another would claim, citing the LTV decision, that the fraud-on-the-market theory “derives from the concept of an efficient market, which concept is gaining judicial acceptance.”⁷⁸ Both were misreadings of prior cases.

The fraud on the market theory had not required market efficiency in the sense that financial economists used the term, and it was certainly wrong as a historical matter that the presumption derived from that theory; the earliest cases were independent of the social science. What was accurate was to say, as Professor Langevoort did in 1985, that “[o]ver the past decade, the courts have *implicitly recognized* the efficient market hypothesis by adopting the ‘fraud on the market’ theory.”⁷⁹ The idea of a free and open public market is different than the idea of an efficient market.⁸⁰ The idea of a free and open market is, as said in the R.H. Macy & Co. appraisal decision, that “the volume of transactions and conditions make the market a fair reflection of the judgment of the buying and selling public.”⁸¹ This is far less demanding than market efficiency as financial economists use the term, where prices reflect the correct implications for security pricing of a particular subset of information.⁸² This subtlety was lost on the courts.

⁷⁵ As Professor Langevoort puts it well, “Efficiency-as-justification subtly becomes efficiency-as-prerequisite, an instance of the economic mode of discourse restricting, rather than expanding, the cognitive process of law-formulation.” Donald C. Langevoort, *Theories, Assumptions, and Securities Regulation: Market Efficiency Revisited*, 140 U. PA. L. REV. 851, 900–01 (1992).

⁷⁶ *Fausett v. Am. Res. Mgmt. Corp.*, 542 F. Supp. 1234, 1238 (D. Utah 1982) (citing 3 A. BROMBERG, *SECURITIES LAW* § 8.6 (1981)) (emphasis added).

⁷⁷ *Id.*

⁷⁸ *McNichols v. Loeb Rhoades & Co.*, 97 F.R.D. 331, 337 (N.D. Ill. 1982) (citing *In re LTV Sec. Litig.*, 88 F.R.D. 134 (N.D. Tex. 1980)) (emphasis added).

⁷⁹ Donald C. Langevoort, *Information Technology and the Structure of Securities Regulation*, 98 HARV. L. REV. 747, 779 n.137 (1985) (emphasis added).

⁸⁰ See *infra* text accompanying notes 81–82.

⁸¹ Application of Marcus, 273 A.D. 725, 727 (App. Div. 1948).

⁸² See generally Jim Chappelow, *Market Efficiency*, INVESTOPEDIA (Sept. 29, 2019), <https://www.investopedia.com/terms/m/marketefficiency.asp> [<https://perma.cc/6B75-ANJQ>].

As a result, in just about three years the fraud on the market theory was said to be “grounded on the assumption that the market price reflects all known material information.”⁸³ A 1984 opinion in the Southern District of New York held “that the ‘fraud-on-the-market’ theory will *only apply* where the market concerned is an efficient one.”⁸⁴ This shift in premise from a “free and open” market to an “efficient market” was advanced in part due to the surprising influence of a 1982 Harvard student Note.⁸⁵

⁸³ T.J. Raney & Sons, Inc. v. Fort Cobb, Oklahoma Irr. Fuel Auth., 717 F.2d 1330, 1332 (10th Cir. 1983) (emphasis added). See also Rosenberg v. Digilog Inc., 648 F. Supp. 40, 43 (E.D. Pa. 1985) (citation omitted) (“The central assumption of the theory is that the market price of a stock reflects all representations made by defendant with respect to that stock.”); Gibb v. Delta Drilling Co., 104 F.R.D. 59, 66 (N.D. Tex. 1984) (citation omitted) (“The theory assumes that market price reflects all known material information.”) Grossman v. Waste Mgmt., Inc., 589 F. Supp. 395, 403 (N.D. Ill. 1984) (citation omitted) (“The fraud on the market theory, as applied to a developed securities market, assumes that the market price of stock reflects all available public information, including material misrepresentations.”).

⁸⁴ Reingold v. Deloitte Haskins & Sells, 599 F. Supp. 1241, 1264 (S.D.N.Y. 1984) (emphasis added). The cases cited here and immediately above show the error in Professor Korsmo’s claim that “[t]he FOTM doctrine, in pre-Basic judicial practice, plainly relied on the uncontroversial notion that stock prices reflect and respond to information in some fashion. Early decisions, however, rarely made mention of the ECMH and did not claim that the FOTM presumption would be appropriate only if markets were infallible.” Charles R. Korsmo, *Market Efficiency and Fraud on the Market: The Danger of Halliburton*, 18 LEWIS & CLARK L. REV. 827, 837 (2014). He goes on to say, “I was able to find only a single district court opinion, *In re LTV Sec. Litig.*, 88 F.R.D. 134, 142–45 (N.D. Tex. 1980), discussing the ECMH in the context of the FOTM doctrine, pre-Basic.” *Id.* at 837 n.56. There were, in fact, many more cases following *LTV*.

⁸⁵ Note, *The Fraud-on-the-Market Theory*, 95 HARV. L. REV. 1143, 1143 (1982). An equally insightful note was Michael A. Lynn, *Fraud on the Market: An Emerging Theory of Recovery Under Sec Rule 10b-5*, 50 GEO. WASH. L. REV. 627 (1982) which was cited in *Basic Inc. v. Levinson*, 485 U.S. 224, 247 n.26 (1988). Other law review commentary to address the fraud on the market theory to that date did not mention market efficiency or the efficient markets concept. See Marc I. Steinberg, *The Propriety and Scope of Cumulative Remedies Under the Federal Securities Laws*, 67 CORNELL L. REV. 557 (1982) (demonstrating no mention of efficient markets in discussion of fraud on the market). The themes first developed in the Harvard Note were further developed later in Barbara Black, *Fraud on the Market: A Criticism of Dispensing with Reliance Requirements in Certain Open Market Transactions*, 62 N.C. L. REV. 435 (1984). Professor Black’s article took a stronger stand that market efficiency should be a prerequisite to the availability of the fraud on the market presumption and her article was cited by Justice White’s concurrence in part and dissent in part in *Basic. Id.* at 439; *Basic*, 485 U.S. at 254.

In *Levinson v. Basic Inc.*,⁸⁶ the 1986 opinion of the United States Court of Appeals for the Sixth Circuit that would so famously be taken up two years later by the Supreme Court, the court relied heavily on the Note's characterization of the early case law in discussing the fraud-on-the-market theory.⁸⁷ The court then turned to the Note's view that "[t]he efficient-market hypothesis is the most persuasive rationale for adopting the fraud-on-the-market theory"⁸⁸ into an asserted third element necessary to invoke the theory, requiring "that the stock was traded on an efficient market[.]"⁸⁹

Courts began to suggest they would require plaintiffs to prove not that a particular market was just free and open but that it was "efficient,"⁹⁰ and most commentators accepted without question the premise that the fraud on the market theory rested on the efficient markets hypothesis, not just free and open public markets.⁹¹ When the Supreme Court handed down *Basic*

⁸⁶ *Levinson v. Basic Inc.*, 786 F.2d 741 (6th Cir. 1986), *vacated*, 485 U.S. 224 (1988).

⁸⁷ *Basic*, 485 U.S. at 247 n.26.

⁸⁸ Note, *The Fraud-on-the-Market Theory*, *supra* note 85, at 1161.

⁸⁹ *Levinson v. Basic Inc.*, 786 F.2d 741, 750 (6th Cir. 1986), *vacated*, 485 U.S. 224 (1988):

In order to invoke the presumption of reliance based upon the fraud on the market theory, a plaintiff must allege and prove five elements. A plaintiff must demonstrate (1) that the defendants made public misrepresentations, ... (2) that the misrepresentations were material, (3) that the stock was traded on an efficient market, ... (4) that the misrepresentations would induce a reasonable, relying investor to misjudge the value of the stock, ... and (5) that the plaintiff traded in the stock between the time the misrepresentations were made and the time the truth was revealed.

Id. (citations omitted). The court cited to precedent for each of the enumerated elements, with the exception of the new third element, which the Court cited to the Harvard student Note. *Id.* (citing Note, *The Fraud-on-the-Market Theory*, *supra* note 85, at 1161).

⁹⁰ *A & J Deutscher Family Fund v. Bullard*, No. CV-85-1850-PAR, 1987 WL 16951, at *2 (C.D. Cal. Mar. 25, 1987) (citation omitted) ("Whether plaintiffs can show fraud-on-the-market—or put another way, whether the market in this stock is efficient—is itself a common question.").

⁹¹ See, e.g., Donald Eric Remensperger, *Causation in Fraud-on-the-Market Actions—Investors' Insurance in the Second Circuit?*; Panziner v. Wolf, 49 BROOK. L. REV. 1291, 1311 (1983) ("The Efficient Capital Market Hypothesis (ECMH) provides the foundation for market fraud actions."); Russell Robinson, *Fraud-on-the-Market Theory and Thinly-Traded Securities Under Rule 10b-5:*

in 1988, the Court's opinion retained some of the modesty of the fraud on the market decisions that, like *LTV*, appealed to the authority of the social science to support an arguably less onerous requirement than efficiency in the sense meant in financial economics.⁹² But the Court said nothing to suggest that less-than-efficiency would do, and, as set out above, the case on appeal had inserted the required element of efficiency.⁹³ The efficiency

How Does a Court Decide If a Stock Market Is Efficient?, 25 WAKE FOREST L. REV. 223, 251 (1990) ("But a showing of efficiency is important. Without such a showing, the fraud-on-the-market theory loses its validity as a substitute for reliance. Courts, therefore, must inquire into the nature of the security's efficiency. This means the courts must ask questions about the process of information regarding the security."); Mark A. Sargent, *State Disclosure Regulation and the Allocation of Regulatory Responsibilities*, 46 MD. L. REV. 1027, 1063, n. 158 (1987) ("The Efficient Capital Market Hypothesis has been used as a basis for criticism and reformulation of legal policy in several areas. For example, it furnishes a key premise for the fraud on the market theory, under which the necessity to demonstrate reliance in rule 10b-5 actions (17 C.F.R. § 240.10b-5 (1986)) is eliminated."); Peter H. Wemple, *Rule 10b-5 Securities Fraud: Regulating the Application of the Fraud-on-the-Market Theory of Liability*, 18 J. MARSHALL L. REV. 733, 746 (1985) ("To protect an individual investor against fraud on efficient markets, the fraud-on-the-market theory does not require proof of actual reliance. Such a requirement would actually impede the purpose of securities laws to encourage market integrity.").

⁹² *Basic Inc. v. Levinson*, 485 U.S. 224, 246–47 (1988):

The presumption is also supported by common sense and probability. Recent empirical studies have tended to confirm Congress; premise that the market price of shares traded on well-developed markets reflects all publicly available information, and, hence, any material misrepresentations. ... Because most publicly available information is reflected in market price, an investor's reliance on any public material misrepresentations, therefore, may be presumed for purposes of a Rule 10b-5 action.

Id.

⁹³ Cf. Jill E. Fisch, *The Future of Price Distortion in Federal Securities Fraud Litigation*, 10 DUKE J. CONST. L. & PUB. POL'Y 87, 91 (2015) ("*Basic* suggested that its analysis depended critically on market efficiency. This led subsequent courts to devote considerable effort to evaluating the extent to which the particular market in which a security traded was sufficiently efficient to justify the *Basic* presumption."); Ann M. Lipton, *Halliburton and the Dog That Didn't Bark*, 10 DUKE J. CONST. L. & PUB. POL'Y 1, 5 (2015) ("Thus, after *Basic*, courts faced two conundrums: how open and developed must a market be before the fraud on the market doctrine is deemed to apply? And if such an open and developed market exists, how 'public' and easily digestible must the information be before it is

requirement already developed in the lower courts gained more momentum. An efficiency inquiry became a shield for defendants.⁹⁴

B. *Cammer v. Bloom*

After *Basic*, defendants became more aggressive in challenging allegations that the securities at issue traded in an efficient market.⁹⁵ But how could a court determine if plaintiffs had

presumed to have an impact? These are related questions—the more developed the market, the more likely it is that obscure information will influence stock prices—but the fraud on the market doctrine does not allow courts to (explicitly) adopt a sliding scale based on the interaction of market characteristics and statement prominence. As a result, courts answered the questions with, respectively, ‘very,’ and (at least in some cases) ‘minimally.’”

⁹⁴ As a procedural matter, it is plaintiffs’ burden to establish entitlement to the fraud on the market presumption: The *Basic* presumption does not relieve plaintiffs of the burden of proving—before class certification—that this requirement is met. See 17 C.F.R. 240.10b-5. *Basic* instead establishes that a plaintiff satisfies that burden by proving the prerequisites for invoking the presumption—namely, publicity, materiality, market efficiency, and market timing. *Basic*, 485 U.S. at 248–49. “The burden of proving those prerequisites still rests with plaintiffs and (with the exception of materiality) must be satisfied before class certification.” *Halliburton Co. v. Erica P. John Fund, Inc.*, 573 U.S. 258, 276 (2014). Defendants can therefore challenge market efficiency before class certification. In addition, “defendants must be afforded an opportunity before class certification to defeat the presumption through evidence that an alleged misrepresentation did not actually affect the market price of the stock.” *Id.* at 284.

⁹⁵ See, e.g., *Guenther v. Pac. Telecom, Inc.*, 123 F.R.D. 333, 339 (D. Or. 1988) (“Defendants’ argument regarding the existence of an efficient market raises two issues: (1) Whether the determination of an efficient market is a proper issue to be resolved on a class certification motion; and (2) if it is, whether plaintiffs have alleged facts sufficient to support a finding of an efficient market.”); *Garfinkel v. Memory Metals, Inc.*, 695 F. Supp. 1397, 1403 (D. Conn. 1988) (“The defendants contend that the plaintiffs should be precluded from utilizing that theory’s presumption of reliance because of the plaintiffs’ failure to prove an essential element of that theory—an ‘efficient’ market for Memory Metals stock.”); *Ockerman v. May Zima & Co.*, No. 3-85-1190, 1988 WL 146617, at *3 (M.D. Tenn. Sept. 23, 1988) (“Defendants argue that plaintiff cannot establish an ‘efficient’ market for first issue bonds because the bond’s price does not reflect all available public information about the economy, financial markets, and the specific company involved.”); *In re Tech. Equities Fed. Sec. Litig.*, No. C-86-20157(A) WAI, 1988 WL 147607, at *6 (N.D. Cal. Oct. 3, 1988) (“Defendants argue that the principle of ‘fraud on the market’ cannot be applied with respect to reliance unless there exists an

adequately alleged an efficient market? In 1989, a district judge sitting in the United States District Court for the District of New Jersey took up the challenge.⁹⁶ *Cammer v. Bloom* presented the question whether securities alleged to have traded in the NASDAQ over-the-counter market traded in an efficient market.⁹⁷ The auditor defendant argued “that only stocks trading on either the New York or American stock exchanges should be eligible for fraud on the market treatment.”⁹⁸ Observing that the auditor defendant sought “to have important distinctions drawn based upon subtle differences between the trading atmospheres at the national exchanges and the over-the-counter market[,]”⁹⁹ the court properly recognized “no reasoned precedent for such distinctions.”¹⁰⁰

The court then sets off on a narrative frolic—free of citation to research from the social sciences—of ad hoc suggestions for alleging an efficient market.¹⁰¹ Relying on a plaintiffs’ expert affidavit offered to help salvage the eighteenth draft of an amended complaint,¹⁰² as well as a securities treatise,¹⁰³ the court

open, well developed and efficient market. They maintain that no such market existed for Technical Equities securities.”); *Harman v. LyphoMed, Inc.*, 122 F.R.D. 522, 525 (N.D. Ill. 1988) (“Defendants try to distinguish *Basic*. They note that LyphoMed stock is traded over the counter, and that the fraud on the market theory does not apply to such securities.”).

⁹⁶ *Cammer v. Bloom*, 711 F. Supp. 1264, 1264–65 (D.N.J. 1989).

⁹⁷ *Id.*

⁹⁸ *Id.* at 1280.

⁹⁹ *Id.* at 1283.

¹⁰⁰ *Id.*

¹⁰¹ *Id.* at 1284–85.

¹⁰² *Id.* at 1278.

While the Amended Complaint—which is the product of twenty-nine capable law firms collaborating on essentially the eighteenth draft—is void of facts which would support the invocation of the fraud on the market theory, plaintiffs have belatedly submitted the Poser Affidavit and numerous other submissions which, they argue, amply demonstrate the efficiency of the market.

Id.

¹⁰³ Wendy Gerwick Couture, *Professor Alan R. Bromberg and the Scholarly Role of the Treatise*, 68 SMU L. REV. 703, 710 (2015).

In April 1989, Judge Alfred James Lechner, Jr., in the United States District Court for the District of New Jersey, issued

offered its opinion on how to determine if securities at issue traded in an efficient market.¹⁰⁴ Whether or not the securities traded on a national exchange was not determinative.¹⁰⁵ But being qualified to file the SEC's Form S-3 was "an important factor weighing in favor of a finding that a market is efficient."¹⁰⁶ The *Cammer* court claimed that "an average weekly trading volume during the class period in excess of a certain number of shares" could be probative of efficiency.¹⁰⁷ In addition, it "would be persuasive to allege a significant number of securities analysts followed and reported on a company's stock during the class period" since "[t]he existence of such analysts would imply" that the auditor defendant's reports "were closely reviewed by investment professionals, who would in turn make

Cammer v. Bloom, one of the first opinions to complete an in-depth analysis of *Basic's* application, and he cited Professor Bromberg and Mr. Lowenfels' treatise nine times, quoting from it extensively. First, he adopted their definition of market efficiency. Second, he agreed with them that market efficiency must be determined on an individualized basis. Third, he identified a series of factors (the so-called *Cammer* factors) that courts should consider when analyzing whether the market for a particular security was efficient Judge Lechner relied on Professor Bromberg and Mr. Lowenfels' guidance in crafting four of these five factors.

Id.

¹⁰⁴ *Cammer*, 711 F. Supp. at 1281.

¹⁰⁵ *Id.*

It would be illogical to apply a presumption of reliance merely because a security is traded within a certain 'whole market', without considering the trading characteristics of the individual stock itself. Some well-followed stocks, such as Apple Computer and MCI Telecommunications, have chosen to trade in the over-the-counter market rather than on a national exchange. On the other hand, some companies listed on national stock exchanges are relatively unknown and trade there only because they met the eligibility requirements. While the location of where a stock trades might be relevant, it is not dispositive of whether the 'current price reflects all available information.'

Id.

¹⁰⁶ *Id.* at 1285.

¹⁰⁷ *Id.* at 1286.

buy/sell recommendations to client investors.”¹⁰⁸ Having “numerous market makers”¹⁰⁹ would make efficiency more likely since “[t]he existence of market makers and arbitrageurs would ensure completion of the market mechanism; these individuals would react swiftly to company news and reported financial results by buying or selling stock and driving it to a changed price level.”¹¹⁰ Finally, the court stated:

it would be helpful to a plaintiff seeking to allege an efficient market to allege empirical facts showing a cause and effect relationship between unexpected corporate events or financial releases and an immediate response in the stock price. This, after all, is the essence of an efficient market and the foundation for the fraud on the market theory.¹¹¹

Professors Gordon and Kornhauser had warned four years before *Cammer* that “the ability to test for market efficiency is subject to question. Virtually none of this doubt, however, has been reflected in the debates about the implications of the efficient market hypothesis for legal decision making.”¹¹² Consistent with their caution, the *Cammer* court expressed no doubt about its proposals for alleging (and presumably proving) market efficiency for securities at issue.¹¹³ With considerable judicial hubris, the *Cammer* court asserted that the answer to the question “Efficient or not?” had answers in data about the type of SEC form an issuer was entitled to use, the amount of weekly volume, the number of securities analysts covering the security, the number of market makers in the stock, and a quantification of price reactions to events to show responsiveness to information.¹¹⁴ None of these represented the view in financial economics.¹¹⁵

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

¹¹⁰ *Id.* at 1286–87.

¹¹¹ *Id.* at 1287.

¹¹² Jeffrey N. Gordon & Lewis A. Kornhauser, *Efficient Markets, Costly Information, and Securities Research*, 60 N.Y.U. L. REV. 761, 765 (1985).

¹¹³ *Cammer*, 711 F. Supp. at 1264–65.

¹¹⁴ *Id.* at 1286–87.

¹¹⁵ See generally Daniel Liberto, *Financial Economics*, Investopedia (Sept. 29, 2019), <https://www.investopedia.com/terms/f/financial-economics.asp> [<https://perma.cc/VF6B-4RLE>].

C. *The Consequences of Cammer*

By virtue of offering an answer, any answer, to a pressing question, *Cammer*, as the first mover, immediately influenced courts throughout the country.¹¹⁶ Courts cited *Cammer* for its plan of “a detailed inquiry into whether the market for the stock is sufficiently active for the pricing mechanism to function and, a priori, capable of being affected by the fraud.”¹¹⁷ Plaintiffs who failed to allege these indicia of efficiency were thrown out by courts citing *Cammer*.¹¹⁸ Within a year, a district judge sitting on the United States District Court for the District of Oklahoma would cite *Cammer* for which “factors might be examined to determine a market’s efficiency.”¹¹⁹ The term stuck. Soon the

¹¹⁶ See *Hayes v. Gross*, 982 F.2d 104, 107 n.1 (3d Cir. 1992) (“We take note of the thorough analysis in *Cammer* ... where the district court, in ruling on a motion for summary judgment under Fed. R. Civ. P. 56, considered whether plaintiffs’ affidavit showed ‘specific fact’ indicating an efficient market.”); *In re Sahlen & Assocs., Inc. Sec. Litig.*, 773 F. Supp. 342, 358 (S.D. Fla. 1991) (“Not only do Plaintiffs specifically state that the market was efficient, but they also set forth several of the indicia of a well-developed, efficient market mentioned in *Cammer*. Accordingly, at least at this juncture in the proceedings, the plaintiffs in *Feld* may proceed on the fraud on the market theory of presumed reliance.”); *Greenberg v. Boettcher & Co.*, 755 F. Supp. 776, 782 (N.D. Ill. 1991) (“In *Cammer* ... the court listed examples of allegations helpful in meeting the efficient market requirement.”); *In re MDC Holdings Sec. Litig.*, 754 F. Supp. 785, 804 (S.D. Cal. 1990) (“In the absence of Ninth Circuit authority, the court finds that the *Cammer* criteria are helpful in determining whether the market is efficient.”); *Stinson v. Van Valley Dev. Corp.*, 719 F. Supp. 362, 363 n.3 (E.D. Pa. 1989) (citing *Cammer*, 711 F. Supp. at 1274–75) (“In *Cammer* ... the court offered the following indicia of market efficiency sufficient to satisfy this threshold: (1) sufficient weekly trading volume, (2) reports and analysis by investment professionals, (3) market makers and arbitragers, (4) eligibility to file S-3 Registration Statement, and (5) historical showing of immediate price response to unexpected events or financial releases.”).

¹¹⁷ *In re Bexar Cty. Health Facility Dev. Corp. Sec. Litig.*, 130 F.R.D. 602, 607 (E.D. Pa. 1990).

¹¹⁸ *Wiley v. Hughes Capital Corp.*, 746 F. Supp. 1264, 1289 (D.N.J. 1990) (citing *Cammer*, 711 F. Supp. at 1286–87) (“In this case, the Plaintiffs have failed to allege or present facts sufficient to raise the inference that Hughes Capital securities were traded on an open and developed market.”).

¹¹⁹ *Kelley v. Mid-Am. Racing Stables, Inc.*, 139 F.R.D. 405, 409 (W.D. Okla. 1990) (emphasis added).

“*Cammer* factors” were the benchmark test for market efficiency.¹²⁰ Defendants argued that a plaintiff must allege all five of the *Cammer* factors,¹²¹ and some courts suggested the same.¹²² One

¹²⁰ *Freeman v. Laventhol & Horwath*, 915 F.2d 193, 199 (6th Cir. 1990) (“The court in *Cammer* identified five factors that would be useful in proving that a security was traded in an efficient market”); *Simpson v. Specialty Retail Concepts*, 823 F. Supp. 353, 354 (M.D.N.C. 1993) (“This court finds the *Cammer* factors instructive and will follow its lead.”).

¹²¹ *See In re Keegan Mgmt. Co. Sec. Litig.*, No. CIV. 91-20084 SW, 1991 WL 253003, at *3 (N.D. Cal. Sept. 10, 1991) (quoting *Cammer*, 711 F. Supp. at 1285–86) (“Defendants argue that plaintiffs’ allegation of an efficient market is deficient because it is not supported by specific allegations of the five types of facts mentioned in *Cammer* However, the *Cammer* court did not hold that the plaintiff must allege all five types of facts in order to establish that the market was open and efficient. The court simply stated that ‘[t]here are several types of facts which, if alleged, might give rise to an inference that [the defendant] traded in an efficient market.’ By listing five types of facts, the court was merely suggesting possible ways of alleging the existence of an open and efficient market. The court did not attempt to delineate the minimum pleading requirements.”).

¹²² *See, e.g., Unger v. Amedisys Inc.*, 401 F.3d 316, 325 (5th Cir. 2005) (citing *Krogman v. Sterritt*, 202 F.R.D. 467, 475 (N.D. Tex. 2001); *Binder v. Gillespie*, 184 F.3d 1059, 1065 (9th Cir. 1999) (quoting *Cammer*, 711 F. Supp. at 1286–87) (“The *Cammer* factors are designed to help make the central determination of efficiency in a particular market. They address five characteristics of the company and its stock: first, whether the stock trades at a high weekly volume; second, whether securities analysts follow and report on the stock; third, whether the stock has market makers and arbitrageurs; fourth, whether the company is eligible to file SEC registration form S-3, as opposed to form S-1 or S-2; and fifth, whether there are ‘empirical facts showing a cause and effect relationship between unexpected corporate events or financial releases and an immediate response in the stock price.’ ... The district court determined that Binder offered evidence only as to the presence of market makers and arbitrageurs. We agree with the district court that this factor alone is insufficient as a matter of law to deem the market for AVBC stock efficient. Accordingly, we affirm the court’s decision to decertify the class through December 1993.”); *In re Surebeam Corp. Sec. Litig.*, No. 03 CV 1721JM(POR), 2005 WL 5036360, at *24 (S.D. Cal. Jan. 3, 2005) (“Because both parties agree that the *Cammer* factors should determine fraud on the market and Plaintiff has not addressed any of the *Cammer* factors, the Complaint does not adequately plead reliance through the fraud-on-the-market theory. Similarly, the Complaint does not set out any factors that would indicate direct reliance on the misstatements, so reliance is inadequately pled.”); *Arena Land & Inv. Co. v. Petty*, 906 F. Supp. 1470, 1481 (D. Utah 1994), *aff’d*, 69 F.3d 547 (10th Cir. 1995) (citation omitted) (“Plaintiffs, without alleging trading volume, plead the pure legal conclusion that Global had an efficient and well developed market for its stock. In support of that conclusion, plaintiffs

court found the fraud on the market theory was “particularly applicable to a large national market such as the NYSE”¹²³ because the *Cammer* factors fit such a market well, a preposterous example of the legal tail wagging the real-world dog; surely we did not need the *Cammer* factors to tell us that the fraud on the market presumption was suited to NYSE stocks.¹²⁴

allege that five of the plaintiffs had this ‘impression’ ‘based on the existence of up to fourteen separate market makers during the class period.’ No allegations suggest that these market makers were actually misled or otherwise misunderstood Global’s situation in any way or otherwise link them with the dates of plaintiffs’ market purchases. No allegations show active trading at any time by the market makers. The volume of the market for Global shares is not alleged. There is no allegation that Global enjoyed the status of being a Form S-3 registrant. Additionally, the allegations of penny market prices, inconsistent financial statements, off market transactions at off market prices, all demonstrate that Global’s market does not meet the requirements set forth in *Basic* Dismissal for failure to state a claim is appropriate where there are inadequate factual allegations to show an efficient, developed market.”); *Alter v. DBLKM, Inc.*, 840 F. Supp. 799, 804 (D. Colo. 1993) (citing *Cammer*, 711 F. Supp. at 1286–87 (“The fraud-on-the-market theory requires showing that the security was traded in large volume during the time period at issue, that a significant number of securities’ analysts followed and reported on the security and that the price changed in relation to public statements or reports about the activities of the issuer.”); *Cammer*, 711 F. Supp. at 1286–87) (“Similarly, the court failed to evaluate the significance of the market-efficiency factors lacking in the instant case. For instance, the number of securities analysts following the stock is an important factor Hence, the fact that no analyst was reporting on Amedisys stock at the time in question should have been weighed against the rather scant utility of, for example, the number of ‘market makers.’ Further, the court did not address the effect on the market efficiency determination of Amedisys’s ineligibility to file an SEC Form S-3 at the time in question (the other factor absent in this case). Because Rule 23 mandates a complete analysis of ‘fraud on the market’ indicators, district courts must address and weigh factors both for and against market efficiency.”).

¹²³ *In re Laidlaw Sec. Litig.*, No. 91-CV-1829, 1992 WL 68341, at *10 n.8 (E.D. Pa. Mar. 31, 1992) (citing *Cammer*, 711 F. Supp. at 1264; *Freeman v. Laventhol & Horwath*, 915 F.2d 193, 199 (6th Cir. 1990)).

¹²⁴ Some decisions of the district courts are nearly impossible to square with the evidence that stock traded in an efficient market. See Charles W. Murdock, Halliburton, *Basic*, and *Fraud on the Market: The Need for A New Paradigm*, 60 VILL. L. REV. 203, 229 (2015) (suggesting “a lack of objectivity and an outcome determinative mentality from the court” in the outcome of *In re Polymedica Corp. Sec. Litig.*, 453 F. Supp. 2d 260 (D. Mass. 2006), a case with strong facts demonstrating efficiency that the court unconvincingly characterized as “weak”).

A decade or so after *Cammer*, the influence of the factors reached a more absurd level, with courts engaged in “angels on the head of a pin” scrutiny of which and how many *Cammer* factors were sufficient:

While it is clear that satisfaction of only one *Cammer* factor is not sufficient as a matter of law to prove the existence of an efficient market, it appears no case has addressed how many *Cammer* factors must be alleged to plead reliance under a fraud-on-the-market theory. Reviewing plaintiffs’ allegations in this case, the court concludes that pleading two of the five factors is not sufficient Plaintiffs have not only failed to plead a majority of the factors, but ... [the issuer] files a Form S-1, not a Form S-3, registration statement. For these reasons, the court finds that plaintiffs have not alleged reliance under a fraud-on-the-market theory with sufficient particularity.¹²⁵

When additional factors were added to the list, the combinations exploded. There were 31 possible combinations of five factors; there were 255 combinations of eight factors. Decisions began to vary erratically.¹²⁶ Defendants focused in on the *Cammer* fifth factor—a history of immediate stock price movements in response to unexpected corporate events and financial releases—because that factor was the junkiest of all, susceptible to the worst of arguments that the market for a security at issue was inefficient.¹²⁷ It was (and remains) an expert witness’s dream. It was also (and remains) hogwash.

¹²⁵ *In re Turbodyne Techs., Inc. Sec. Litig.*, No. CV9900697MMMBQRX, 2000 WL 33961193, at *14 (C.D. Cal. Mar. 15, 2000) (citations omitted). The court noted that “[a]ssuming plaintiffs can plead additional *Cammer* factors, it is not clear that the fact Turbodyne files a Form S-1 precludes a finding that its stock trades in an efficient market.” *Id.* at *14 n.108.

¹²⁶ See Geoffrey Christopher Rapp, *Proving Markets Inefficient: The Variability of Federal Court Decisions on Market Efficiency in Cammer v. Bloom and Its Progeny*, 10 U. MIAMI BUS. L. REV. 303, 305 (2002) (“I suggest that while the courts in question may appear to be sufficiently sophisticated to discern the level of efficiency in a securities market, in fact they are not. The courts embrace a laundry list of factors economists have suggested as indicators of market efficiency, but fail to show an aptitude for considering these factors in a deeper, contextual fashion.”). See also David Tabak, *Counting Cammer Factors—A Review of Case Law*, LAW360 (Aug. 30, 2012), <https://www.law360.com/articles/372672/counting-cammer-factors-a-review-of-case-law> [<https://perma.cc/R2EV-3TER>].

¹²⁷ See, e.g., *In re Sci.-Atlanta, Inc. Sec. Litig.*, 571 F. Supp. 2d 1315, 1339 (N.D. Ga. 2007) (citations omitted) (“In support of that position, Defendants

II. *CAMMER* IS JUNK SCIENCEA. *How Financial Economists Test for Efficiency: (Tradeable) Predictable Returns*

Market efficiency¹²⁸ is one of those concepts that is in one sense easy to understand while remaining rather technical.

rely on the affidavit of their expert, Dr. Cox, who conducted an ‘event study’ which analyzed the effect of 20 allegedly fraudulent statements identified in the Complaint on the market price of SA stock. According to Dr. Cox, the results of his event study did not show statistically significant positive stock price movement in response to these allegedly fraudulent statements. Based on these results, he opines that ‘[t]he Complaint’s efficiency claim is inconsistent with its allegations of material false and misleading statements.’”); *O’Neil v. Appel*, 165 F.R.D. 479, 503 (W.D. Mich. 1996) (“[Plaintiff’s expert] attempted to show instances of a fall in the price of [the] stock in response to the dissemination of adverse information. [Defendant’s expert] demonstrated, however, that within days thereafter, the price rose almost to its original level, without any dissemination of ‘good news’ that could account for the increase.”). This practice continues. *See, e.g., Monroe Cty. Employees’ Ret. Sys. v. S. Co.*, No. 1:17-CV-00241-WMR, 2019 WL 2482399, at *5 (N.D. Ga. June 12, 2019) (“Plaintiffs note that Dr. Gompers testified that he only considered the fifth *Cammer* factor when evaluating market efficiency. Plaintiffs contend that by refusing to even consider the other factors, Dr. Gompers’ opinion is not only inconsistent with binding legal authority, but also that it is unreliable as it is based on a biased, cherry-picked review of the record that ignores all contrary evidence.”). The strategy still comes close to working with courts who do not understand (as explained further below) that statistical significance is meaningless in determining market efficiency under the fifth *Cammer* factor. *See, e.g., Menaldi v. Och-Ziff Capital Mgmt. Grp. LLC*, 328 F.R.D. 86, 96–97 (S.D.N.Y. 2018) (“[Defendant] Och-Ziff argues that [plaintiff’s expert] Dr. Nye’s data failed to show that the stock price actually reacted to news events. Whereas only 5% of a random sampling of days is expected to produce statistically significant price movement, Dr. Nye found statistically significant price movement in the days following eight of the seventeen news events—or 47.1%. Och-Ziff argues that this is too low a percentage. This is perhaps Och-Ziff’s strongest argument. While Nye’s event study still shows a significant cause-and-effect relationship between news events and price movement, this objection nevertheless weakens the Nye Report’s persuasive force.”) (citations omitted); *City of Cape Coral Mun. Firefighters’ Ret. Plan v. Emergent Biosolutions, Inc., HQ*, 322 F. Supp. 3d 676, 687 (D. Md. 2018) (“Defendants only challenge Lead Plaintiffs’ conclusion that the fifth, empirical *Cammer* factor cuts in favor of market efficiency in this case.”).

¹²⁸ This Article is concerned with informational efficiency: the idea that prices fully reflect a given subset of information. On its own, this says nothing

Lawyers without formal training in its theoretical underpinnings and its relation to the rest of financial economics have consistently struggled as a result. It is not true, for example, that “[a]n efficient capital market is one in which the current price of a security is the best estimate of what the price of that security will be in the future”¹²⁹ because, among other reasons, future prices can be efficient but be expected to increase by the return required in equilibrium.¹³⁰ It is true that “[s]ecurities that trade in efficient markets have rapid price adjustments to new information[,]”¹³¹ one way to shorthand the theory. But even this is

about the “allocational efficiency” of the stock market, that is, whether the stock market does a good job of drawing capital into socially optimal pursuits. The assumption that market efficiency is an important social goal is due partly to the assumption that efficient prices facilitate allocative efficiency. See Marcel Kahan, *Securities Laws and the Social Costs of “Inaccurate” Stock Prices*, 41 DUKE L.J. 977, 980 (1992) (analyzing allocative mistakes, among other social costs of inefficient prices); Lynn A. Stout, *The Unimportance of Being Efficient: An Economic Analysis of Stock Market Pricing and Securities Regulation*, 87 MICH. L. REV. 613, 616 (1988) (noting one assumption “necessary to the view that improving market efficiency is an important goal of securities regulation ... is that accurate stock prices are desirable because stock market prices influence the production, distribution, and consumption of goods and services in the economy.”). Importantly, that which improves informational efficiency can lead to poor allocative efficiency, see Yesha Yadav, *How Algorithmic Trading Undermines Efficiency in Capital Markets*, 68 VAND. L. REV. 1607, 1670 (2015), and presumably vice versa. Professor Yadav makes a strong argument for potential allocative inefficiencies of high-frequency trading even as most research suggests (and Professor Yadav acknowledges) that high-frequency trading improves informational efficiency. See, e.g., Jonathan Brogaard, Terrence Hendershott, & Ryan Riordan, *High-Frequency Trading and Price Discovery*, 27 REV. FIN. STUD. 2267, 2303–04 (2014) (demonstrating that the trading patterns of high-frequency traders are suggestive of informationally efficient trading).

¹²⁹ Jonathan R. Macey & Geoffrey P. Miller, *Good Finance, Bad Economics: An Analysis of the Fraud-on-the-Market Theory*, 42 STAN. L. REV. 1059, 1076 (1990) (citing Daniel R. Fischel, *Use of Modern Finance Theory in Securities Fraud Cases Involving Actively Traded Securities*, 38 BUS. LAW. 1, 4 n.9 (1982)). Neither Macey, Miller, nor Fischel are trained financial economists.

¹³⁰ See Eugene F. Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25 J. FIN. 383, 384 (1970) (describing next period’s price in terms of an equilibrium expected return model).

¹³¹ Randall S. Thomas & James F. Cotter, *Measuring Securities Market Efficiency in the Regulatory Setting*, LAW & CONTEMP. PROBS. 105, 106 (2000). The rest of the quote is inaccurate, however: “... whereas those in inefficient

an “if A, then B” logic that must be used with care: *if* a security trades in an efficient market, *then* it has a rapid price adjustment to new information. It is, of course, a basic logical fallacy to argue from there that “if B, then A,” that is, if a security has a rapid price adjustment to new information, then it trades in an efficient market. The adjustment could be rapid but very wrong.

The best starting place for understanding the efficient markets hypothesis remains Professor Fama’s 1970 review article,¹³² where he observes that “[a]ll empirical research on the theory of efficient markets has been concerned with whether prices ‘fully reflect’ particular subsets of available information.”¹³³ Both parts of this concern are important to understand.¹³⁴ “Fully reflect” means that the information under study cannot be used to earn superior risk-adjusted returns.¹³⁵ “Particular subsets” is important as well.¹³⁶ A test must specify the information that is hypothesized to be fully reflected in the price.¹³⁷ One can certainly hypothesize that the prior history of prices is fully reflected

markets do not.” Prices could, of course, react quickly but highly inaccurately when news is released.

¹³² Fama, *supra* note 130, at 383. As of 2006, this was the 20th most-cited article in all of economics since 1970. E. Han Kim, Adair Morse & Luigi Zingales, *What Has Mattered to Economics Since 1970*, 20 J. ECON. PERSPECTIVES 189, 193 (2006).

¹³³ Fama, *supra* note 130, at 388. Of course, prices will likely reflect only the information that is worth acquiring on the margin. See Eugene F. Fama, *Efficient Capital Markets: II*, 46 J. FIN. 1575, 1575 (1991) (citing Michael C. Jensen, *Some Anomalous Evidence Regarding Market Efficiency*, 6 J. FIN. ECON. 95 (1978)) (“A weaker and economically more sensible version of the efficiency hypothesis says that prices reflect information to the point where the marginal benefits of acting on information (the profits to be made) do not exceed the marginal costs.”).

¹³⁴ See Fama, *supra* note 130, at 388.

¹³⁵ See *id.* at 388, 413–14. It is important to note that the question is almost always whether the information can be used to generate superior returns, not whether the price is fundamentally “correct.” Because the existence of superior returns requires positing some model of how returns are generated, however, there is a link to models of market equilibrium that are, in essence, models of how assets should be priced if the assumptions of the model hold.

¹³⁶ A formal and precise exposition of this concept is Mark Latham, *Informational Efficiency and Information Subsets*, 41 J. FIN. 39, 39–41 (1986) (presenting a formalization of Fama’s notion of efficiency with respect to subsets of information).

¹³⁷ See *id.* at 39.

in the price (called “weak-form efficiency”),¹³⁸ that all publicly available information is reflected in the price (called “semi-strong form efficiency”),¹³⁹ or that all information—private as well—is reflected in price (called “strong-form efficiency”).¹⁴⁰ But in all cases, the *testing* of that hypothesis requires the identification of the subset of information that is assumed under the hypothesis to be available to the market.¹⁴¹ This has long been a source of considerable difficulty in practice.¹⁴²

Nevertheless, there is one test that nearly all financial economists agree on,¹⁴³ even if its application in specific situations can be controversial.¹⁴⁴ That is a test for the short-run *tradeable*

¹³⁸ *Id.* at 39–41.

¹³⁹ *Id.*

¹⁴⁰ *Id.*

¹⁴¹ *See id.* at 40.

¹⁴² *See* Daniel Friedman, Glenn W. Harrison & Jon W. Salmon, *The Informational Efficiency of Experimental Asset Markets*, 92 J. POL. ECON. 349, 350 (1984) (“A fundamental difficulty in devising any test of such general efficient market hypotheses, however, is the specification of the relevant public and private information sets of traders. Without a consensus as to reasonable empirical specifications, tests of the hypotheses remain minimal or controversial.”).

¹⁴³ There are many tests of market efficiency where financial economists do not even agree that the test is capable of distinguishing efficient from inefficient prices. *See generally* Robert J. Shiller, *Do Stock Prices Move Too Much to be Justified by Subsequent Changes in Dividends?*, 71 AM. ECON. REV. 421, 433–34 (1981). The best known of these are tests of whether stocks are too volatile to be consistent with ex post cash flows (dividends) to stocks. *See generally id.* Such tests are directed more at whether prices reflect a particular view of fundamental value than the reaction of prices to information. *See id.* (arguing that the variance of stock prices is inconsistent with the present value model of future dividends); Stephen F. LeRoy & Richard D. Porter, *The Present-Value Relation: Tests Based on Implied Variance Bounds*, 49 ECONOMETRICA 555, 559 (1981) (similar); Stephen F. LeRoy, *Efficiency and the Variability of Asset Prices*, 74 AM. ECON. REV. 183, 184–85 (1984) (arguing against the interpretation of market inefficiency); Terry A. Marsh & Robert C. Merton, *Dividend Variability and Variance Bounds Tests for the Rationality of Stock Market Prices*, 76 AM. ECON. REV. 483, 483–84 (1986) (criticizing the reliability of variance-bounds tests of market efficiency); Robert J. Shiller, *The Use of Volatility Measures in Assessing Market Efficiency*, 36 J. FIN. 291–92 (1981) (defending use of volatility measures to judge market efficiency).

¹⁴⁴ *See, e.g.,* John M. Griffin, Patrick J. Kelly & Federico Nardari, *Do Market Efficiency Measures Yield Correct Inferences? A Comparison of Developed and Emerging Markets*, 23 REV. FIN. STUD. 3225, 3226 (2010).

(that is, potentially profitable, after trading costs) predictability of stock returns, whether the predictor is some feature of the time-series of past prices or some non-price information like an earnings announcement.¹⁴⁵ The presence of such predictable returns would suggest that traders could earn superior risk-adjusted returns by investing in the securities under test.¹⁴⁶ Indeed, the theory of market efficiency has its roots in the empirical fact that early researchers determined that stock price changes for individual stocks were essentially unpredictable, and therefore, untradeable in a consistently profitable way.¹⁴⁷ In his groundbreaking article, *The Behavior of Stock-Market Prices*,¹⁴⁸ Eugene F. Fama presented the strongest evidence to that date that the past history of an individual stock's returns was not useful in predicting stock returns.¹⁴⁹ He characterized his results as "*consistent with the existence of an 'efficient' market for securities, that is, a market where, given the available information, actual prices at every*

¹⁴⁵ See, e.g., *id.* (testing efficiency "in terms of a) a practical notion of efficiency: the returns to trading strategies based on past returns and earnings announcements; and b) the deviations prices exhibit from the random walk paradigm.").

¹⁴⁶ See Stephen F. LeRoy, *Efficient Capital Markets and Martingales*, 27 J. ECON. LIT. 1583, 1583–84 (1989) ("It is only differences in information—information that is not 'fully reflected' in prices—that confer comparative advantage, and that therefore can form the basis for profitable trading rules.").

¹⁴⁷ See Fama, *supra* note 130, at 383 ("Though we proceed from theory to empirical work, to keep the proper historical perspective we should note that to a large extent the empirical work in this area preceded the development of the theory."). The unpredictability of prices appears first to have been set out by Louis Bachelier, *The Theory of Speculation* (A. James Boness, trans.), in THE RANDOM CHARACTER OF STOCK PRICES (Paul H. Cootner, ed.). Fama's work also benefited from the insights of Maurice G. Kendall, *The Analysis of Economic Time-Series, Part I: Prices*, 116 J. ROYAL STAT. SOC'Y 11 (1953) (presenting empirical evidence of a random walk in indices of stock prices); and M.F.M. Osborne, *Brownian Motion in the Stock Market*, 7 OPERATIONS RES. 145 (1959) (documenting random walks in individual stocks); Holbrook Working, *The Investigation of Economic Expectations*, 39 AM. ECON. REV. 150, 159–60 (1949) (setting out reasons why changes in futures prices should be "completely unpredictable").

¹⁴⁸ Eugene F. Fama, *The Behavior of Stock-Market Prices*, 38 J. BUS. 34 (1965).

¹⁴⁹ Professor Fama studied the 30 stocks that comprised the Dow Jones Industrial Average. *Id.* at 45. See also Eugene F. Fama & Marshall E. Blume, *Filter Rules and Stock-Market Trading*, 39 J. BUS. 226, 240 (1966) (concluding "that our results add further to the evidence that for practical purposes the random-walk model is an adequate description of price behavior.").

point in time represent very good estimates of intrinsic values.”¹⁵⁰ Such weak-form efficiency is virtually never rejected in any free and open public market. By comparison to the *Cammer* factors discussed below, the examination of returns for predictability is mostly a matter of applying accepted methodology correctly and accounting for measurement error and transactions costs (so as not to suggest tradeable predictability where it does not exist).¹⁵¹

Empirical results on the lack of tradeable short-run predictable returns are consistent with—and help explain—findings on the inability of professionals to beat the market.¹⁵² The first well-known study of the ability of professionals to find mispriced securities was by Alfred Cowles, published in 1933 in *Econometrica*.¹⁵³ Cowles found that “the most successful records are little, if any, better than what might be expected to result from pure chance.”¹⁵⁴ Additional tests began in earnest in the mid-1960s. For example, Professor William F. Sharpe (who would go on to share the Nobel Prize in Economics for the development of the Capital Asset Pricing Model) published his paper, *Mutual Fund Performance*,¹⁵⁵ in 1966, finding support for “the view that the capital market is highly efficient and that good [mutual fund]

¹⁵⁰ Fama, *supra* note 148, at 90 (emphasis in original).

¹⁵¹ See, e.g., Hendrik Bessembinder & Kalok Chan, *Market Efficiency and the Returns to Technical Analysis*, 27 FIN. MGMT. 5 (1998) (documenting measurement error and lack of robustness to trading costs of simple technical trading rules). Given the wide acceptance of weak-form efficiency as the most basic requirement of market efficiency, it is ironic that one court that considered the *Cammer* factors refused to consider evidence of a random walk, presumably because the expert and/or the counsel did a very poor job of explaining the analysis. *McNamara v. Bre-X Minerals, Ltd.*, No. 5:97-CV-159, 2002 WL 32076175, at *5 (E.D. Tex. Sept. 30, 2002) (“[The expert] asserts that the ‘relationship between market efficiency and the random walk character of price changes is well-recognized in the economics and finance literature’ and ‘has testable implications.’ [citation to affidavit]. However, Plaintiffs have provided no specific instances where the relationship is recognized.”).

¹⁵² See Alfred Cowles, *Can Stock Market Forecasters Forecast?*, 1 ECONOMETRICA 309, 324 (1933); William F. Sharpe, *Mutual Fund Performance*, 39 J. BUS. 119, 138 (1966) (illustrating that professionals evaluate risk and diversity rather than trying to beat the market).

¹⁵³ Cowles, *supra* note 152, at 309.

¹⁵⁴ *Id.* at 324.

¹⁵⁵ Sharpe, *supra* note 152, at 119.

managers concentrate on evaluating risk and providing diversification, spending little effort (and money) on the search for incorrectly priced securities.”¹⁵⁶ In his 1968 study,¹⁵⁷ Professor Michael C. Jensen found similar evidence.¹⁵⁸ Subsequent decades have witnessed the mounting of evidence against the ability of active investors to beat the apparently efficient securities markets. Passive index funds continue to beat active equity managers.¹⁵⁹ This inability of professional money managers to beat passive benchmarks is, for many, highly persuasive evidence of market efficiency.¹⁶⁰

¹⁵⁶ *Id.* at 138.

¹⁵⁷ Michael C. Jensen, *The Performance of Mutual Funds in the Period 1945–1964*, 23 J. FIN. 389 (1968).

¹⁵⁸ *Id.* at 415.

¹⁵⁹ Daisy Maxey & Chris Dieterich, *Indexes Beat Stock Pickers Even Over 15 Years*, WALL ST. J. (Apr. 13, 2017), <https://www.wsj.com/articles/indexes-beat-stock-pickers-even-over-15-years-1492039859> [<https://perma.cc/QX47-476Z>]; Chris Newlands & Madison Marriage, *99% of Actively Managed US Equity Funds Underperform*, FIN. TIMES (Oct. 23, 2016), <https://www.ft.com/content/e139d940-977d-11e6-a1dc-bdf38d484582> [<https://perma.cc/3VFU-6EDL>]. Accumulated evidence of underperformance by active managers has generated a massive shift to passive investing. *See, e.g.*, Kate Beioley, *US active funds suffer record \$143bn “exodus” in December*, FIN. TIMES (Jan. 17, 2019), <https://www.ft.com/content/4b863bbe-1a7a-11e9-9e64-d150b3105d21>; Corrie Driebusch, *Investors Pulling More Money From Actively Managed U.S. Stock Funds*, WALL ST. J. (Jan. 13, 2016), <https://www.wsj.com/articles/investors-pulling-more-money-from-actively-managed-u-s-stock-funds-1452702638> [<https://perma.cc/76D5-7VAX>]; Chris Flood, *Vanguard Retains Title as World’s Fastest-Growing Asset Manager*, FIN. TIMES (Jan. 4, 2018), <https://www.ft.com/content/753e1afe-f149-11e7-ac08-07c3086a2625> [<https://perma.cc/W4D2-HMWL>]; Attracta Mooney, *Passive Funds Grew 4.5 Times Faster Than Active in 2016*, FIN. TIMES (Feb. 12, 2017), <https://www.ft.com/content/c4f6ee56-e48c-11e6-9645-c9357a75844a> [<https://perma.cc/C9QB-R5J9>].

¹⁶⁰ *See, e.g.*, Eugene F. Fama, *Two Pillars of Asset Pricing*, 104 AM. ECON. REV. 1467, 1482 (2014) (“However one judges market efficiency, it has motivated a massive body of empirical work that has enhanced our understanding of markets, and, like it or not, professional money managers have to address its challenges.”); Stanley J. Kon & Frank C. Jen, *The Investment Performance of Mutual Funds: An Empirical Investigation of Timing, Selectivity, and Market Efficiency*, 52 J. BUS. 263, 263 (1979) (observing that Jensen’s mutual fund studies “have been cited as support for the strong form of the Efficient Markets Hypothesis (EMH); that is, whether any investor has monopolistic access to any information relevant for price formation”).

While market efficiency remains the subject of ongoing research in financial economics,¹⁶¹ it is crucial to acknowledge that financial economists virtually never test, as litigants do, whether the pricing of a *single* stock is efficient.¹⁶² The reason is more or less the same as the reasons Alon Brav and I gave for the glaring difference between single-firm event studies in securities litigation and the multi-firm event studies used in academic research¹⁶³: single-firm tests have extremely low statistical power and the ability to predict single-firm returns is very poor.¹⁶⁴ For this reason, financial economists look for evidence of inefficiency by studying many firms, usually in portfolios, to increase the statistical power of their tests.¹⁶⁵ Second, and relatedly, by using more powerful tests on portfolios of many firms, evidence of inefficiencies such as this that are (arguably) found can have

¹⁶¹ See, e.g., Shmuel Baruch, Marios Panayides & Kumar Venkataraman, *Informed Trading and Price Discovery Before Corporate Events*, 125 J. FIN. ECON. 561, 561–62 (2017) (presenting evidence on the incorporation of information); Jonathan Brogaard, Allen Carrion, Thibaut Moyaert, Ryan Riordan, Andriy Shkilko & Konstantin Sokolov, *High Frequency Trading and Extreme Price Movements*, J. FIN. ECON. 253, 253–54 (2018) (studying the effect of high-frequency traders around extreme price movements); Markus Brunnermeier, *Information Leakage and Market Efficiency*, 18 REV. FIN. STUD. 417, 417 (2005) (studying the use of leaked information by an informed trader); Jennifer Conrad, Sunil Wahal & Jin Xiang, *High-Frequency Quoting, Trading and the Efficiency of Prices*, 116 J. FIN. ECON. 271, 271 (2015) (finding that high frequency trading reduces trading costs and drives prices closer to random-walk behavior); Murray Z. Frank & Ali Sanati, *How Does the Stock Market Absorb Shocks?*, 129 J. FIN. ECON. 136, 136 (2018) (examining market responses to positive and negative news); Jeewon Jang & Jangkoo Kang, *Probability of Price Crashes, Rational Speculative Bubbles, and the Cross-Section of Stock Returns*, 132 J. FIN. ECON. 222, 222–23 (2019) (examining the trading of sophisticated investors around times of high probability of extreme negative returns); George J. Jiang & Kevin X. Zhu, *Information Shocks and Short-Term Market Underreaction*, 124 J. FIN. ECON. 43, 43 (2017) (studying price reactions to information shocks); Clara Vega, *Stock Price Reaction to Public and Private Information*, 82 J. FIN. ECON. 103, 103–04 (2006) (studying the market efficiency association of information with the arrival of informed and uninformed traders).

¹⁶² Brav & Heaton, *supra* note 49, at 583.

¹⁶³ *Id.*

¹⁶⁴ See Richard Roll, *R²*, 43 J. FIN. 541, 541 (1988) (demonstrating the lack of predictive ability of regressions to predict individual stock returns).

¹⁶⁵ See *id.*

very small “effect sizes”¹⁶⁶ that may have little real-world significance for an active trader.¹⁶⁷

B. *Cammer Does Something Else*

1. *A Large Weekly Trading Volume*

The first *Cammer* factor is a large trading volume: “First, plaintiffs could have alleged there existed an average weekly trading volume during the class period in excess of a certain number of shares.”¹⁶⁸ According to the *Cammer* court:

[t]he reason the existence of an actively traded market, as evidenced by a large weekly volume of stock trades, suggests there is an efficient market is because it implies significant investor interest in the company. Such interest, in turn, implies a likelihood that many investors are executing trades on the basis of newly available or disseminated corporate information.¹⁶⁹

Of course, there is nothing about “significant investor interest in the company” that implies that trades resulting from such interest are “execut[ed] ... on the basis of newly available or disseminated information[,]” and nothing suggesting that such trading, if it occurs, is trading that fully reflects the information quickly in the stock price.¹⁷⁰

The *Cammer* court cited the Bromberg and Lowenfels treatise, Bromberg & Lowenfels, 4 Securities Fraud and Commodities Fraud, § 8.6 (Aug. 1988), for the proposition that “[t]urnover measured by average weekly trading of two percent or more of the outstanding shares would justify a strong presumption that the market for the security is an efficient one; one

¹⁶⁶ A good source on effect sizes and relation to statistical power is PAUL D. ELLIS, *THE ESSENTIAL GUIDE TO EFFECT SIZES: STATISTICAL POWER, META-ANALYSIS, AND THE INTERPRETATION OF RESEARCH RESULTS* (2010).

¹⁶⁷ See, e.g., Allen B. Atkins & Edward A. Dyl, *Price Reversals, Bid-Ask Spreads, and Market Efficiency*, 25 J. FIN. QUANTITATIVE ANALYSIS 535, 535 (1990) (presenting evidence that possible overreactions after large price changes are not profitable after taking transactions costs into account).

¹⁶⁸ *Cammer v. Bloom*, 711 F. Supp. 1264, 1286 (D.N.J. 1989).

¹⁶⁹ *Id.*

¹⁷⁰ *Id.*

percent would justify a substantial presumption.”¹⁷¹ This was utter speculation by the commentators, neither of whom would reasonably be considered an expert in the efficient markets hypothesis. Certainly, there was nothing in the existing literature to justify their assertion.

Volume is neither necessary nor sufficient for efficiency.¹⁷² There is, in fact, a certain irony to the fact that a large volume is the first *Cammer* factor. One of the more intriguing results in rational expectations economics is the “no-trade theorem” of Paul Milgrom and Nancy Stokey.¹⁷³ To put their insight simply, prices in their model adjust with no trade because rational agents immediately recognize the price implications of new information.¹⁷⁴ The evidence on volume in financial economics is often interpreted as evidence of disagreement about price, in the sense that high volume is not expected when traders agree on the implications of new information for price.¹⁷⁵ Volume is also related to liquidity needs—selling for cash rather than information trading.¹⁷⁶ In all cases, price and volume seem to be related in complicated ways,¹⁷⁷ none of which allow volume to be a test for efficiency.

¹⁷¹ *Id.*

¹⁷² *See, e.g., supra* text accompanying notes 81–82.

¹⁷³ Paul Milgrom & Nancy Stokey, *Information, Trade and Common Knowledge*, 26 J. ECON. THEORY 17, 17 (1982).

¹⁷⁴ *Id.* at 17–18.

¹⁷⁵ This disagreement can be rational or irrational. *See, e.g.,* Jonathan M. Karpoff, *A Theory of Trading Volume*, 41 J. FIN. 1069, 1069 (1986) (presenting a theory of volume including agreement, disagreement, and divergent prior expectations); Terrance Odean, *Volume, Volatility, Price, and Profit When All Traders Are Above Average*, 53 J. FIN. 1887, 1887 (1998) (studying the effects of overconfidence on trade, including its tendency to increase volume); Meir Statman, Steven Thorley & Keith Vorkink, *Investor Overconfidence and Trading Volume*, 19 REV. FIN. STUD. 1531, 1531 (2006) (attributing high volume to investor overconfidence about their trading skills); Ho-Mou Wu & Wen-Chung Guo, *Asset Price Volatility and Trading Volume with Rational Beliefs*, 23 J. ECON. THEORY 795, 795 (2004) (studying the relation between volume and belief structures in rational markets).

¹⁷⁶ *See, e.g.,* Joon Chae, *Trading Volume, Information Asymmetry, and Timing Information*, 60 J. FIN. 413, 413 (2005) (“Trading volume is generally characterized as either informed or uninformed (liquidity trading).”).

¹⁷⁷ *See, e.g.,* Jonathan M. Karpoff, *The Relation Between Price Changes and Trading Volume: A Survey*, 22 J. FIN. & QUANTITATIVE ANALYSIS 109, 109

2. A Significant Number of Reports by Securities Analysts

The second *Cammer* factor is the existence of a significant number of reports by securities analysts: “Second, it would be persuasive to allege a significant number of securities analysts followed and reported on a company’s stock during the class period.”¹⁷⁸ Here, the *Cammer* court’s rationale was that

[t]he existence of such analysts would imply, for example, the [auditor reports at issue] were closely reviewed by investment professionals, who would in turn make buy/sell recommendations to client investors. In this way the market price of the stock would be bid up or down to reflect the financial information contained in the [auditor’s] reports, as interpreted by the securities analysts.¹⁷⁹

This assumes a wealth of facts about the behavior of securities analysts and the response of client investors to their “buy/sell recommendations[,]” none of which implies price efficiency.¹⁸⁰ The court cited no source for its speculations here, not even the Bromberg & Lowenfels treatise.¹⁸¹

In fact, the importance of analysts in financial markets is questionable.¹⁸² Analysts are known to provide distorted recommendations.¹⁸³ Only a small minority of analyst recommendation changes seem to matter in markets, and even those depend

(1987); Paula A. Tkac, *A Trading Volume Benchmark: Theory and Evidence*, 34 J. FIN. & QUANTITATIVE ANALYSIS 89, 89 (1999).

¹⁷⁸ *Cammer v. Bloom*, 711 F. Supp. 1264, 1286 (D.N.J. 1989).

¹⁷⁹ *Id.*

¹⁸⁰ *See id.*

¹⁸¹ *Id.*

¹⁸² *See, e.g.*, Narasimhan Jegadeesh, Joonghyuk Kim, Susan D. Krische & Charles M.C. Lee, *Analyzing the Analysts: When Do Recommendations Add Value?*, 59 J. FIN. 1083, 1083 (2004) (providing evidence of both value-destructive and value-added analyst activity); Brett Trueman, *Analyst Forecasts and Herding Behavior*, 7 REV. FIN. STUD. 97, 97 (1994) (finding that analysts stay close to prior earnings estimates and herd toward each other’s estimates); Ivo Welch, *Herding Among Security Analysts*, 58 J. FIN. ECON. 369, 369 (2000) (demonstrating that analysts herd but not in a useful way on good information).

¹⁸³ *See* Ulrike Malmendier & Devin Shanthikumar, *Do Security Analysts Speak in Two Tongues?*, 27 REV. FIN. STUD. 1287, 1287 (2014) (studying strategic distortions by security analysts).

heavily on whether the analyst is a reputational leader, is moving away from the consensus view, and what type of firm is involved.¹⁸⁴ The usefulness of analysts depends on the state of the economy.¹⁸⁵ Analysts with less industry experience before becoming analysts make poorer forecasts than analysts with industry-related prior experience.¹⁸⁶ There is evidence that analysts add little or no value in the twentieth century,¹⁸⁷ and excessive analyst coverage has been associated with overpricing and low returns.¹⁸⁸

This second *Cammer* factor has another flaw, one that it shares with the next two *Cammer* factors as well: it tends to be a proxy for market capitalization.¹⁸⁹ Larger firms have more analysts.¹⁹⁰ While this size-bias may tend to generate correct efficiency determinations in cases involving large firms, it necessarily creates a relative bias against smaller firms that are—if traded on national exchanges exposed to professional traders—also quite likely to be traded in efficient markets.¹⁹¹

¹⁸⁴ See, e.g., Michael B. Clement & Senyo Y. Tse, *Financial Analyst Characteristics and Herding Behavior in Forecasting*, 60 J. FIN. 307, 307 (2005) (distinguishing between the value of analyst forecasts that are “bold” versus “herding” with other analysts); Roger K. Loh & René M. Stulz, *When Are Analyst Recommendation Changes Influential?*, 24 REV. FIN. STUD. 593, 593 (2011) (“We show that only 12% of recommendation changes are influential. Recommendation changes are more likely to be influential if they are from leader, star, previously influential analysts, issued away from consensus, accompanied by earnings forecasts, and issued on growth, small, high institutional ownership, or high forecast dispersion firms.”).

¹⁸⁵ Roger K. Loh & René M. Stulz, *Is Sell-Side Research More Valuable in Bad Times?*, 73 J. FIN. 959, 959 (2018) (presenting evidence that analysts work harder and are relied on more in bad economic times).

¹⁸⁶ Daniel Bradley, Sinan Gokkaya & Xi Liu, *Before an Analyst Becomes an Analyst: Does Industry Experience Matter?*, 72 J. FIN. 751, 751 (2017).

¹⁸⁷ See, e.g., Oya Altinkilic, Robert S. Hansen, & Liyu Ye, *Can Analysts Pick Stocks for the Long Run?*, 119 J. FIN. ECON. 371, 371 (2016) (finding a reduced information role for analysts in the period after 2003); Robert S. Hansen, *What is the Value of Sell-Side Analysts? Evidence from Coverage Changes—A Discussion*, 60 J. ACCT. & ECON. 58, 64 (2015) (discussing evidence that “evidence indicating analysts’ reports are not particularly informative for the average investor”).

¹⁸⁸ John A. Doukas, Chansog (Francis) Kim & Christos Pantzalis, *The Two Faces of Analyst Coverage*, 34 FIN. MGMT. 99, 99 (2005).

¹⁸⁹ O’Neil v. Appel, 165 F.R.D. 479, 503 (W.D. Mich. 1996).

¹⁹⁰ *Id.* at 501.

¹⁹¹ See Richard Roll, *A Possible Explanation of the Small Firm Effect*, 36 J. FIN. 879, 879 (1981).

3. *The Existence of Market-Makers and Arbitrageurs in the Security*

The third *Cammer* factor is the existence of market-makers and arbitrageurs in the security:

Third, it could be alleged the stock had numerous market makers. The existence of market makers and arbitrageurs would ensure completion of the market mechanism; these individuals would react swiftly to company news and reported financial results by buying or selling stock and driving it to a changed price level.¹⁹²

Again, the *Cammer* court cited no source.¹⁹³ And, again, the existence of market makers and arbitrageurs does not imply “swiftly” reacting prices.¹⁹⁴ Perhaps such prices that result from their presence are efficient; perhaps they are not. The market makers must not just be there; they must be good at their job.

Professor Fama’s original work on the efficient markets hypothesis recognized as much, asking how many superior predictors of new information and processors of that information—the arbitrageurs in the *Cammer* framework—would be necessary to ensure that successive price changes were independent?¹⁹⁵ He answered, “It is impossible to give a firm answer ... since the effectiveness of the superior [traders] probably depends more on the extent of their resources than on their number. Perhaps a single, well-informed and well-endowed specialist in each security is sufficient.”¹⁹⁶

¹⁹² *Cammer v. Bloom*, 711 F. Supp. 1264, 1286–87 (D.N.J. 1989). One court, though accepting the factor itself, rejected the speculations of Bromberg and Lowenfels about the number of such market makers necessary for efficiency. See *O’Neil*, 165 F.R.D. at 502 (W.D. Mich. 1996) (citing Bromberg and Lowenfels, § 8.6 at 8.815) (“Bromberg and Lowenfels [sic] suggest a rule of thumb, under which the existence of at least five market makers would be some indicia of efficiency The authors do not cite any case law or economic studies to support their rule of thumb. As noted in the text above, the economic studies clearly do not support the authors’ suggestion. Furthermore, both Dr. Cox and Mr. Kangas testified that the rules of thumb suggested by Bromberg and Lowenfels [sic] have no support in the economic literature. Therefore, I reject their rules of thumb as being unsupported speculation.”).

¹⁹³ *Cammer*, 711 F. Supp. at 1286.

¹⁹⁴ See *O’Neil*, 165 F.R.D. at 501–02.

¹⁹⁵ See *Cammer*, 711 F. Supp. at 1286–87 (D.N.J. 1987); Fama, *supra* note 148, at 40.

¹⁹⁶ Fama, *supra* note 148, at 40.

There is no authority in financial economics for linking market efficiency to a counting of arbitrageurs.¹⁹⁷

Another objection to using, as an indicator of market efficiency, the mere presence of arbitrageurs is a phenomenon known as the “limits to arbitrage”¹⁹⁸—the possibility that mispricing can sometimes be difficult to bet against.¹⁹⁹ The limits to arbitrage argument is powerful, with considerable support.²⁰⁰ It suggests reasons why this *Cammer* factor is unreliable, and also cautions—as discussed further below—against assuming a free and open public market without some look at whether such limits to arbitrage are important for the security at issue.²⁰¹

This factor, as mentioned above, is also likely to be too correlated with market capitalization to add much above it and is therefore relatively biased against small firms that nevertheless trade in efficient markets.²⁰²

¹⁹⁷ The role of arbitrageurs in financial markets is a subject of much study. See, e.g., Suleyman Basak & Benjamin Croitoru, *On the Role of Arbitrageurs in Rational Markets*, 81 J. FIN. ECON. 143, 143 (2006) (providing an example of an article discussing the role of arbitrageurs in financial markets).

¹⁹⁸ The seminal work is Andrei Shleifer & Robert W. Vishny, *The Limits to Arbitrage*, 52 J. FIN. 35, 35 (1997) (presenting a theoretical model where arbitrageurs are limited in their ability to take advantage of mispricing because investors may withdraw funds if the mispricing gets worse before being corrected).

¹⁹⁹ *Id.* at 42.

²⁰⁰ See, e.g., Malcolm Baker & Serkan Savasoglu, *Limited Arbitrage in Mergers and Acquisitions*, 64 J. FIN. ECON. 91, 93–94 (2002) (finding evidence of limited arbitrage in risk arbitrage around mergers and acquisitions); John A. Doukas, Chansog (Francis) Kim & Christos Pantzalis, *Arbitrage Risk and Stock Mispricing*, 45 J. FIN. QUANTITATIVE ANALYSIS 907, 907 (2010) (finding supportive evidence); Mark Mitchell, Todd Pulvino & Erik Stafford, *Limited Arbitrage in Equity Markets*, 57 J. FIN. 551, 551–52 (2002) (identifying apparent mispricing of parent companies relative to their subsidiary, and attributing the survival of the mispricing to the risks of arbitrage); Eli Ofek, Matthew Richardson & Robert F. Whitelaw, *Limited Arbitrage and Short Sales Restrictions: Evidence from the Options Markets*, 74 J. FIN. ECON. 305, 305 (2004) (finding evidence of limits to arbitrage in options markets); Jeffrey Pontiff, *Costly Arbitrage: Evidence from Closed-End Funds*, 111 Q.J. ECON. 1135, 1136 (1996) (documenting limits to arbitrage against high-discount closed-end funds).

²⁰¹ See generally Andrei Shleifer & Robert W. Vishny, *The Limits to Arbitrage*, 52 J. FIN. 35, 35 (1997).

²⁰² See *O’Neil v. Appel*, 165 F.R.D. 479, 503 (W.D. Mich. 1996).

4. The Eligibility of the Company to File an S-3 Registration Statement

The fourth *Cammer* factor is the eligibility of the issuer to file an S-3 registration statement:

Fourth, as discussed, it would be helpful to allege the Company was entitled to file an S-3 Registration Statement in connection with public offerings or, if ineligible, such ineligibility was only because of timing factors rather than because the minimum stock requirements set forth in the instructions to Form S-3 were not met. Again, it is the number of shares traded and value of shares outstanding that involve the facts which imply efficiency.²⁰³

This factor was based on the fact that the Securities and Exchange Commission allowed issuers to use Form S-3 if they, “are widely followed by professional analysts[,]”²⁰⁴ since the Commission believed, “that the market operates efficiently for these companies, i.e., that the disclosure in Exchange Act reports and other communications by the registrant, such as press releases, has already been disseminated and accounted for by the market place.”²⁰⁵

Thus, the Form S-3 factor is redundant of the second factor—the presence of securities analysts—and simply pushes the buck to the Commission: the securities of issuers that can use Form S-3 are probably efficient because the SEC allows Form S-3 for issuers it thinks are trading in efficient markets.²⁰⁶ Of course, the SEC is almost surely correct, but not because they have been conscientious in testing for efficiency every issuer able to file on Form S-3. Finally, as mentioned above, this factor is essentially a proxy for market capitalization, and therefore relatively biased against smaller firms.²⁰⁷

²⁰³ *Cammer v. Bloom*, 711 F. Supp. 1264, 1287 (D.N.J. 1989).

²⁰⁴ *Id.* at 1284 (quoting SEC Securities Act Release No. 6235, 45 Fed. Reg. 63,693 (1980)).

²⁰⁵ *Cammer*, 711 F. Supp. at 1284.

²⁰⁶ *See id.* at 1284–85.

²⁰⁷ *See O’Neil*, 165 F.R.D. at 503.

5. *Movement of the Stock Price Caused by Unexpected Corporate Events or Financial Releases*

The fifth *Cammer* factor is a history of immediate movement of the stock price caused by unexpected corporate events or financial releases:

Finally, it would be helpful to a plaintiff seeking to allege an efficient market to allege empirical facts showing a cause and effect relationship between unexpected corporate events or financial releases and an immediate response in the stock price. This, after all, is the essence of an efficient market and the foundation for the fraud on the market theory.²⁰⁸

There are two elementary errors at play here.²⁰⁹ The first error is that a price need not react to any particular unexpected corporate event or financial release.²¹⁰ As Professor Langevoort has observed, markets may not react because, “the market had figured out the essential truth on its own[,]”²¹¹ or, said differently, the events identified by experts and their staffs in litigation and then compared against the price series for reaction may already have been impacted in the price through an unidentified means of information transmission.²¹² But the real problem comes in defining what it means to react. In practice, the definition, until recently, meant the generation of statistically significant price reactions, that is, identifying events and then concluding that the market is inefficient if the resulting price reaction is not statistically significant.²¹³ This test assumes that prices are not efficient unless price reactions are large enough to be statistically significant.²¹⁴ This reflects a serious misunderstanding of both efficiency and statistics.²¹⁵

²⁰⁸ *Cammer*, 711 F. Supp. at 1287.

²⁰⁹ *See id.*

²¹⁰ *See* Donald C. Langevoort, *Judgment Day for Fraud-on-the-Market: Reflections on Amgen and the Second Coming of Halliburton*, 57 ARIZ. L. REV. 37, 57 (2015).

²¹¹ *Id.* at 54.

²¹² *See id.* at 52.

²¹³ *See id.* at 46–47.

²¹⁴ *See id.*

²¹⁵ Some confusion in the cases appears to trace to the mistaken characterization of statistical significance in an influential article by a law professor

Prices can react efficiently to information even though the price reactions themselves are not so large in size as to approach statistical significance.²¹⁶ Statistical significance is just a measure of the size of a reaction relative to its average and its variability, but nothing says that the corporate event must have a certain size to be efficiently reflected in the security's price, especially since, as just observed, part of the information may already be in the price before the news released identified by the litigant's expert.²¹⁷ Thus, while a statistically significant reaction to a firm-specific news event might be evidence that information was reflected in the price (absent confounding effects), the converse is not true—the failure of the price to react so extremely as to be two standard deviations from average does not establish that the market is inefficient; it may mean only that the correctly sized value impact that occurred was less than 1.96 standard deviations from the mean.²¹⁸

without advanced training in financial economics. See Daniel R. Fischel, *Use of Modern Finance Theory in Securities Fraud Cases Involving Actively Traded Securities*, 38 BUS. LAW. 1, 2 (1982). Fischel incorrectly assumed that returns needed to be statistically significant against an assumed model to be evidence of injury:

By comparing this predicted return with the actual return immediately after disclosure in 1978 of the correct information, a conclusion could be reached about the effect of the alleged failure to disclose the costs of compliance with environmental regulations. If the difference between the actual return and the predicted return is not statistically significant, investors were not injured.

Id. at 19. Fischel appears not to have understood the low statistical power of his model and how that renders statistical significance unreliable for determining price impact (injury). See *id.*

²¹⁶ One frequent securities expert witness studies the stocks in the S&P 500, and found that some stocks “respond to earnings announcements in a statistically significant manner only about half of the time, implying that a requirement that a stock respond in a statistically significant manner to news events all or nearly all the time may not be consistent with the data.” Tabak, *supra* note 13. Given the almost unquestionable efficiency of the pricing of this set of stocks—if they are not efficiently priced, none are—this is a near-ideal illustration of the disconnect between a price reaction and whether that reaction is so large as to reach statistical significance.

²¹⁷ See *id.*

²¹⁸ See STEPHEN T. ZILIAK & DEIRDRE N. MCCLOSKEY, *THE CULT OF STATISTICAL SIGNIFICANCE: HOW THE STANDARD ERROR COSTS US JOBS, JUSTICE,*

There are court opinions in nine-figure securities cases that would fail a college freshman's statistics exam on such reasoning, as in the case of *In re American International Group, Inc.*,²¹⁹ a case where the court determined that defendants had rebutted the fraud-on-the-market presumption on certain dates because price moves were statistically significant only at the 10 percent level (size) but not the 5 percent level.²²⁰ It used to be rare but refreshing when courts got it right.²²¹ As courts have become more aware of the games defendants play in such situations, they have begun more frequently rejecting the junk science requirement of statistical significance proffered by defense experts.²²²

AND LIVES, at 1–2, 45, 222 (2008) (providing for a definitive treatment of the widespread misunderstanding of statistical significance and its consequences).

²¹⁹ 265 F.R.D. 157, 187 (S.D.N.Y. 2010), *vacated and remanded*, 689 F.3d 229 (2d Cir. 2012).

²²⁰ The court determined that the lack of a statistically significant price move at the 5% level on March 30 and 31, 2005, demonstrated that the fraud had not impacted the stock price. *Id.* at 185–87. The same court's determinations regarding AIG bonds have been severely criticized as well. *See* Hartzmark et al., *supra* note 9, at 654–55 (criticizing the AIG court, which “found insufficient empirical evidence to hold that the \$1.71 billion in AIG bonds, issued by the world's largest insurance company, traded in open, developed, and efficient markets.”). Courts continue to botch the application of this factor in more recent cases. *See, e.g.*, *Ohio Pub. Employees Ret. Sys. v. Fed. Home Loan Mortg. Corp.*, No. 4:08CV0160, 2018 WL 3861840, at *17 (N.D. Ohio Aug. 14, 2018) (“Upon weighing the evidence, as the Court must, the Court holds that OPERS has failed to establish market efficiency.”) *Federal Home Loan Mortgage Corporation's* market capitalization was in the many billions of dollars. The Court plainly lacked an understanding of the statistical evidence. *Id.* at 11 (“Statistical significance, however, is essential to give meaning to statistical evidence. As courts have recognized, absent statistical significance, correlation is meaningless.”).

²²¹ In one reported case, the judge saw through the fallacious argument that “in an efficient market material news should result in a statistically significant change in [the issuer's] stock price.” *In re Nature's Sunshine Product's Inc.*, 251 F.R.D. 656, 664 (D. Utah 2008) (rejecting defendants' argument that market for stock was not efficient because “of the 93 event days chosen by [plaintiffs' expert], only 23 of those days (or less than 25%) result in a statistically significant change to Nature's stock price”).

²²² *See, e.g.*, *Vizirgianakis v. Aeterna Zentaris, Inc.*, No. 18-2474, 2019 WL 2305491, at *2 (3d Cir. May 30, 2019) (“Aeterna's hired expert, Dr. David Tabak, responded to the declaration of plaintiffs' expert, pointing out that Dr. Werner had not proven—to a 95% confidence level—that the alleged misrepresentations made on August 30, 2011 impacted the price of Aeterna's common stock. The district court found this evidence insufficient to rebut the

The second error is that the existence of a large price reaction does not imply efficiency or the need for news.²²³ Why assume that the large price reaction was accurate?²²⁴ Statistical significance certainly does not imply accuracy.²²⁵ Indeed, a price overreaction will generally achieve a higher level of statistical significance than an accurate price reaction.²²⁶ Early commentators recognized even before *Cammer* that, “[t]he fact that trades affect stock prices, however, is unrelated to the efficient market thesis, as is the fact that traders act upon the available information.”²²⁷

The fact is that while prices in efficient markets react quickly,²²⁸ the fully reflective price reaction may be too small to reach statistical significance.²²⁹ That should not matter, since statistical significance is nothing more than a measure of relative size, and nothing in the law says that only price impacts that big or bigger are actionable.²³⁰ Additionally, the presence of

presumption. It aptly noted that plaintiffs do not have the burden to prove price impact (or lack thereof), so it was not surprising that their expert’s report did no such thing.”).

²²³ See David Romer, *Rational Asset-Price Movements Without News*, 83 AM. ECON. REV. 1112, 1113 (1993) (demonstrating the potential for prices to react because of the trading of other traders rather than news).

²²⁴ See, e.g., Bradford Cornell & James C. Rutten, *Market Efficiency, Crashes, and Securities Litigation*, 81 TUL. L. REV. 443, 454 (2006) (“A stock can be significantly mispriced and still respond promptly to news. For example, a stock that was overpriced by fifty percent could jump ten percent in response to a positive announcement, as many dot-com stocks did, and still be overpriced by fifty percent, if not more.”).

²²⁵ See *id.* at 449.

²²⁶ This is because an overreaction will be larger in magnitude and thus more likely to be significant, since the test statistic is typically a function of the observed price less the average price.

²²⁷ Black, *supra* note 62, at 933.

²²⁸ Price reactions on exchanges have reacted quickly for decades. See, e.g., Catherine S. Woodruff & A.J. Senchack, Jr., *Intradaily Price-Volume Adjustments of NYSE Stocks to Unexpected Earnings*, 43 J. FIN. 467 (1988) (studying speed of adjustment to earnings surprises); Prem C. Jain, *Response of Hourly Stock Prices and Trading Volume to Economic News*, 61 J. BUS. 219 (1988) (studying speed of adjustment to macroeconomic news). This is even more so today.

²²⁹ See Cornell & Rutten, *supra* note 224, at 449.

²³⁰ Thus, assertions that some number of returns must be statistically significant are illogical and not based in any proper reasoning from financial economics. For an example of such an assertion by a defendant, see *Wilson v. LSB Indus., Inc.*, No. 15CIV7614RAGWG, 2018 WL 3913115, at *13 (S.D.N.Y.

statistical significance does not imply accuracy, and therefore, does not imply efficiency.²³¹ Again, as a measure of size—relative to the average and the variability of the return or price—statistical significance is more likely to be found when prices overreact than react correctly.²³²

C. Other Factors

In *Krogman v. Sterritt*,²³³ the District Court for the Northern District of Texas stated that “[e]conomic theory suggests that several other factors may be relevant in determining market efficiency[,]” citing another case that cited two law review articles.²³⁴ It appears, however, that these additional factors were proposed by defendant’s economic expert.²³⁵ Unsurprisingly, these factors are no more reliable than the *Cammer* factors.

1. The Capitalization of the Company

Krogman asserted that “[m]arket capitalization, calculated as the number of shares multiplied by the prevailing share price, may be an indicator of market efficiency because there is a greater incentive for stock purchasers to invest in more highly capitalized corporations.”²³⁶ There is no support in the literature for this assertion.

The “incentive” for investing in a security is often a complex question of risk and return, where both are rationally analyzed with respect to the other assets that the investor owns. There is, in finance theory, nothing to suggest that the security of a highly capitalized corporation is per se more attractive to an investor, and it is easy to come up with counterexamples where that would not be true, such as if the security of the highly capitalized

Aug. 13, 2018) (“Next, defendants assert that the event study failed to establish market efficiency because it found statistically significant residual returns on only two of the three dates it analyzed.”). The court was unpersuaded by this misleading argument. *Id.*

²³¹ See Tabak, *supra* note 13.

²³² See *id.*

²³³ 202 F.R.D. 467 (N.D. Tex. 2001).

²³⁴ *Id.* at 477.

²³⁵ *Id.* at 478.

²³⁶ *Id.*

corporation had a poor risk-return contribution to the investor's current portfolio than the security of a small-capitalization firm. Put more bluntly, any student in an introductory investment class asked to determine whether a security was a good investment for a hypothetical investor would get zero credit for an answer that a particular security was a good investment because the firm that issued it had a high market capitalization.

Larger capitalization firms may be more efficiently priced than smaller firms,²³⁷ but this does not imply that smaller firms are not priced quite efficiently, though in lesser degree than large firms.²³⁸

2. *The Bid-Ask Spread of the Stock*

Krogman also asserted that “[a] large bid-ask spread is indicative of an inefficient market, because it suggests that the stock is too expensive to trade.”²³⁹ There is no evidence for this assertion.

As with the first *Krogman* factor (high capitalization), the rationale given—“the stock is too expensive to trade”—is nonsensical.²⁴⁰ If that were true, there would be no trades for the security at the assumedly large bid-ask spread. But firms with large bid-ask spreads trade, just at the larger spread.²⁴¹ In any event, bid-ask spread does not measure inefficiency.²⁴² Bid-ask spreads are sensitive to information imbalances, and the bid-ask spread compensates in part for the risks of this asymmetry.²⁴³

²³⁷ See, e.g., Josef Lakonishok & Inmoo Lee, *Are Insider Trades Informative?*, 14 REV. FIN. STUD. 79, 82 (2001) (finding that insider trading is more profitable at smaller firms, consistent with the conjecture that larger firms are more efficiently priced).

²³⁸ See Bradford Cornell & John Haut, *How Efficient Is Sufficient: Applying the Concept of Market Efficiency in Litigation*, 74 BUS. LAW. 417, 420–22 (2019) (discussing different degrees of efficiency).

²³⁹ *Krogman v. Sterritt*, 202 F.R.D. 467, 478 (N.D. Tex. 2001).

²⁴⁰ *Id.* at 474.

²⁴¹ *Id.* at 478.

²⁴² *Id.*

²⁴³ See Thomas E. Copeland & Dan Galai, *Information Effects on the Bid-Ask Spread*, 38 J. FIN. 1457, 1457–58, 1465 (1983); Lawrence R. Glosten, *Components of the Bid-Ask Spread and the Statistical Properties of Transactions Prices*, 42 J. FIN. 1293, 1293 (1987) (decomposing the bid-ask spread into a component related to information asymmetry and a component related to monopoly power); Lawrence R. Glosten & Lawrence E. Harris, *Estimating*

There are also reasons why in an efficient market the bid-ask spread will increase as the size of the firm decreases.²⁴⁴ Bid-ask spread also measures liquidity.²⁴⁵ In the large literature that exists on the bid-ask spread,²⁴⁶ researchers do not equate bid-ask spreads with efficiency or characterize stocks with large bid-ask spreads as being “too expensive to trade.”²⁴⁷

3. *The Percentage of Stock Not Held by Insiders*

Finally, *Krogman* quoted the expert’s affidavit in asserting that “[b]ecause insiders may have private information that is not yet reflected in stock prices, the prices of stocks that have greater holdings by insiders are less likely to accurately reflect all available information about the security.”²⁴⁸ There is no evidence to support the conjecture that publicly traded stocks with high insider ownership are inefficiently priced. To the contrary, the market appears to charge a higher cost of equity where informed insider trading may be used to exploit investors.²⁴⁹

the Components of the Bid/Ask Spread, 21 J. FIN. ECON. 123, 131, 140–41 (1988) (demonstrating that a significant amount of the spread is due to information asymmetry; P.C. Venkatesh & R. Chiang, *Information Asymmetry and the Dealer’s Bid-Ask Spread: A Case Study of Earnings and Dividend Announcements*, 41 J. FIN. 1089, 1090 (1986) (studying dealer use of the bid-ask spread in response to possible information asymmetry).

²⁴⁴ See generally Richard Roll, *A Simple Implicit Measure of the Effective Bid-Ask Spread in an Efficient Market*, 39 J. FIN. 1127 (1984). See also J.Y. Choi, Dan Salandro & Kuldeep Shastri, *On the Estimation of the Bid-Ask Spreads: Theory and Evidence*, 23 J. FIN. & QUANTITATIVE ANALYSIS 219 (1988) (confirming Roll’s model in empirical tests).

²⁴⁵ See, e.g., Yakov Amihud & Haim Mendelson, *Asset Pricing and the Bid-Ask Spread*, 17 J. FIN. ECON. 223, 243 (1986) (“And, rather than suggesting an ‘anomaly’ or an indication of market inefficiency, our return-spread relation represents a rational response by an efficient market to the existence of the spread.”); Benjamin M. Blau & Ryan J. Whitby, *The Volatility of Bid-Ask Spreads*, 44 FIN. MGMT. 851, 851, 869 (2015) (examining the relation between bid-ask spreads and returns due to liquidity).

²⁴⁶ In addition to the sources cited above, see also Hans R. Stoll, *Inferring the Components of the Bid-Ask Spread: Theory and Empirical Tests*, 44 J. FIN. 115 (1989).

²⁴⁷ See Amihud & Mendelson, *supra* note 245, at 243.

²⁴⁸ *Krogman v. Sterritt*, 202 F.R.D. 467, 478 (N.D. Tex. 2001).

²⁴⁹ See Utpal Bhattacharya & Hazem Daouk, *The World Price of Insider Trading*, 57 J. FIN. 75, 97 (2002) (finding that the enforcement of insider trading laws reduces the cost of equity).

Of course, all firms have insiders that may have private information not yet reflected in stock prices,²⁵⁰ but there is no reason to believe that firms with greater holdings by insiders have more such information. This factor also illustrates well a serious problem with a list of ad hoc factors: they can tempt a court to view factors one at a time instead of considering the factors in light of one another.²⁵¹ The *Krogman* court asserted that inside ownership could lead to inefficient pricing, but inside ownership is prevalent at some of today's largest market-capitalization companies like Alphabet Inc. (Google) and Facebook.²⁵² The idea that the securities of these companies are not traded in an efficient market (for purposes of the fraud on the market presumption) because of their high percentage insider ownership is absurd and without support in any reliable financial economic studies.

III. A FREE AND OPEN PUBLIC MARKET IS EFFICIENT

How can we do securities litigation without junk science? The best thing after killing *Cammer* would be a return to the early days of the fraud on the market presumption, with a modern check. Those were days that required only a free and open public market.²⁵³ In *Basic*, the Supreme Court quoted the following sentence from an earlier Eleventh Circuit case: "The idea of a free and open public market is built upon the theory that competing judgments of buyers and sellers as to the fair price of a security brings [sic] about a situation where the market price reflects as nearly as possible a just price."²⁵⁴ The idea of a "free and open public market" is, of course, an abstraction like the idea of an "efficient market." But it is a far less demanding abstraction. As the

²⁵⁰ See, e.g., Shijung Cheng, Venky Nagar & Madhav V. Rajan, *Insider Trades and Private Information: The Special Case of Delayed-Disclosure Trades*, 20 REV. FIN. STUD. 1833, 1861 (2007) (finding strong evidence of the informativeness of certain insider trades at S&P 500 firms).

²⁵¹ See *Krogman*, 202 F.R.D. at 474 (enumerating factors courts consider when addressing degree of market efficiency).

²⁵² *Id.* at 478.

²⁵³ *Krogman v. Sterritt*, 202 F.R.D. 467, 475 (N.D. Tex. 2001) (noting the internet rendered *Cammer* factors useless).

²⁵⁴ *Basic Inc. v. Levinson*, 485 U.S. 224, 246 (1988) (quoting *Lipton v. Documentation, Inc.*, 734 F.2d 740, 748 (CA11 1984), *cert. denied*, 469 U.S. 1132 (1985)).

Cammer court recognized, “An open market is one in which anyone, or at least a large number of persons, can buy or sell.”²⁵⁵ For courts that must—even when they deal in theories and abstractions—make decisions about the messy real world, the notion of “a free and open public market” is far better suited to litigation than the financial economists’ ever-evolving theory of efficient markets.²⁵⁶ Appealing to the existence of social science evidence in 1979 and 1980 was unnecessary but understandable for courts relying—as they long had—on securities market prices.²⁵⁷ *Requiring* market efficiency in the exact sense of this theoretical concept was a mistake. It is also clearly not what the Supreme Court intended in *Basic*, where the Court expressly disavowed adopting “any particular theory of how quickly and completely publicly available information is reflected in market price.”²⁵⁸ The fact that the meaning of “efficiency” in fraud on the market jurisprudence was not identical to that of financial economics was again emphasized in the Court’s 2014 *Halliburton* decision, rejecting a

focus[] on the debate among economists about the degree to which the market price of a company’s stock reflects public information about the company—and thus the degree to which an investor can earn an abnormal, above-market return by trading on such information The Court instead based the [Basic] presumption on the fairly modest premise that “market professionals generally consider most publicly announced material statements about companies, thereby affecting stock market prices.” ... Even the foremost critics of the efficient-capital-markets hypothesis acknowledge that public information generally affects stock prices.²⁵⁹

²⁵⁵ *Cammer v. Bloom*, 711 F. Supp. 1264, 1276 n.17 (D.N.J. 1989) (quoting *Bromberg & Lowenfels* § 8.6).

²⁵⁶ *Id.* at 1276.

²⁵⁷ *See Basic*, 485 U.S. at 255.

²⁵⁸ *Id.* at 248 n.28.

²⁵⁹ *Halliburton Co. v. Erica P. John Fund, Inc.*, 573 U.S. 258, 271–72 (2014). It is important to recognize, however, that the Supreme Court only a year before had arguably characterized the fraud on the market presumption as one that “springs from the very concept of market efficiency.” *Amgen Inc. v. Conn. Ret. Plans & Tr. Funds*, 568 U.S. 455, 462 (2013). This is language reminiscent of those courts that may forget the origins of fraud on the market in a pre-efficient markets framework, though the later characterization of efficiency in

Complying with *Basic*'s demand for efficiency as emphasized in *Halliburton* demands that there be a free and open public market where information is reflected in market price quickly and completely enough for it to be reasonable to consider that the price at which plaintiffs purchased or sold was artificial as a result of the alleged fraud.²⁶⁰ A plaintiff invokes the presumption by pleading the existence of a free and open public market for the security at issue, that is, the ability of buyers and sellers to engage in securities trades without significant restrictions on either buyers or sellers.²⁶¹ For class certification, a plaintiff would present evidence on the free and open nature of the market for the security.²⁶² Can investors buy and sell in the market without substantial restrictions on participation like substantial lockups of potential sellers or bans on short selling?²⁶³ The answer for exchange-traded securities will—as it should be—almost always be yes.²⁶⁴

But here is the modern check: sometimes there will be sufficient constraints—violations of the “free and open” requirement—that will make the presumption unavailable, such as an inability to sell short which can prevent the market price from reflecting the views of relatively pessimistic traders²⁶⁵ or lockups that remove

Halliburton suggests this to mean nothing more than that the market responds quickly and completely (to some extent) to new information.

²⁶⁰ *Halliburton Co.*, 573 U.S. at 282–83.

²⁶¹ *See id.* at 259–60, 268.

²⁶² *See id.* at 258, 261.

²⁶³ *See* Edward M. Miller, *Risk, Uncertainty, and Divergence of Opinion*, 32 J. FIN. 1151, 1162 (1977).

²⁶⁴ *See* Charles M. Jones & Owen A. Lamont, *Short-Sale Constraints and Stock Returns*, 66 J. FIN. ECON. 207, 210–11 (2002).

²⁶⁵ The classic explanation is Edward M. Miller, *Risk, Uncertainty, and Divergence of Opinion*, 32 J. FIN. 1151, 1162 (1977) (stating that “without short selling the price of a security is raised if there is divergence of opinion. A sufficient amount of short selling could increase the volume of the security outstanding until its price was forced down to the average valuation of all investors.”). There is substantial evidence that short selling is important to market pricing. *See, e.g.*, Ekkehart Boehmer & Juan (Julie) Wu, *Short Selling and the Price Discovery Process*, 26 REV. FIN. STUD. 287, 318 (2013) (documenting the greater accuracy of stock prices when short sellers are active); Karl B. Diether, Kuan-Hui Lee & Ingrid M. Werner, *Short-Sale Strategies and Return Predictability*, 22 REV. FIN. STUD. 575, 604 (2009) (examining the extent and

potential sellers from participating in the market, with results akin to short-selling restrictions.²⁶⁶

Overall, if you can look it up on a Bloomberg terminal and trade it with a major financial firm, it is almost surely worthy of the label “efficient” for purposes of fraud on the market, absent independent proof of truly binding restrictions on the trading of an important subset of potential buyers or sellers.²⁶⁷

Efficiency in this sense is consistent with the common-sense approach of the fraud on the market jurisprudence before the introduction of efficiency in the social science sense, the sense of financial economics.²⁶⁸ It also is consistent with the Court’s jurisprudence on the duties of ERISA fiduciaries.²⁶⁹ It was in 2014, the same year as *Halliburton*, when the Court in *Fifth Third Bancorp v. Dudenhoeffer* held that it “usually is not imprudent to assume that a major stock market ... provides the best estimate of the value of the stocks traded on it that is available to

importance of short selling in U.S. stocks); Charles M. Jones & Owen A. Lamont, *Short-Sale Constraints and Stock Returns*, 66 J. FIN. ECON. 207, 237 (2002); Mahdi Nezafat, Mark Schroder & Qinghai Wang, *Short-Sale Constraints, Information Acquisition, and Asset Prices*, 172 J. ECON. THEORY 273, 274 (2017) (presenting a model that short-sales constraints during financial crises increase volatility and may not support prices); Pedro A.C. Saffi & Kari Sigurdsson, *Price Efficiency and Short Selling*, 24 REV. FIN. STUD. 821, 822–23 (2011) (examining the same for global stocks).

²⁶⁶ See, e.g., Robin Greenwood, *Trading Restrictions and Stock Prices*, 22 REV. FIN. STUD. 509 (2009) (demonstrating substantial price impact from restrictions on trading in certain Japanese stocks).

²⁶⁷ This approach is also consistent with the fact that courts generally do not apply the fraud on the market presumption in cases involving newly issued securities, since such securities are sold only by the issuer and are not subject to the views of other sellers, including short sellers. See, e.g., *In re Volkswagen “Clean Diesel” Mktg., Sales Practices, & Prod. Liab. Litig.*, No. MDL 2672 CRB (JSC), 2018 WL 1142884, at *8 (N.D. Cal. Mar. 2, 2018) (citations omitted) (stating “a number of courts have declined to apply *Basic* in cases involving newly issued securities”). There are often seller lockups on insiders at the time of the IPO. See Alon Brav & Paul A. Gompers, *The Role of Lockups in Initial Public Offerings*, 16 REV. FIN. STUD. 1 (2003). This keeps a number of sellers off the market for a time. In addition, options trading is often delayed for short time after an IPO. Put options trades are one way for investors with a negative view on a stock to bet against it.

²⁶⁸ See *Basic v. Levinson*, 268 U.S. 224, 246 (1988) (citing to literature supporting efficient capital market theory).

²⁶⁹ See *Fifth Third Bancorp v. Dudenhoeffer*, 134 S. Ct. 2459, 2470–71 (2014).

him.”²⁷⁰ Efficiency for fraud on the market purposes need not be any more difficult. Just as it “usually is not imprudent” for an ERISA fiduciary “to assume that a major stock market ... provides the best estimate of the value of the stocks traded on it that is available to him[,]” it usually is not imprudent for an investor to assume the same, and certainly it usually is not imprudent to assume that false information disseminated in such a market can create an artificial price at which investors will trade.²⁷¹ Of course, “usually” is not “always,” and there may be evidence of sufficient problems in the relevant market—problems that limit the interaction of active buyers and sellers—to call the assumption (and the resulting presumption) into question.²⁷² In those cases, the presumption might be unavailable, and in all cases, the defendant would, at the class certification stage, retain its ability to demonstrate the lack of a price impact (which is the lack of fraud-induced artificiality) in the price of the security at issue.²⁷³ The point is, all this work can be done more easily and far more reliably without the junk science of the *Cammer* factors.

CONCLUSION

In a 2010 decision, the United States Court of Appeals for the Ninth Circuit observed that “[t]he absence of *Cammer* efficiency does not mean that prices are unreliable.”²⁷⁴ This was a laudable statement, but far from enough. *Cammer* is junk science. The *Cammer* factors (and the additional factors that courts use) do not do what they claim: distinguish efficient security pricing from inefficient security pricing.²⁷⁵ Normally, junk science comes to litigation via the parties and safeguards on the admissibility of expert opinion—while by no means always adequate—to catch much of it and prevent it from living long in our legal system. When a judge fashions the junk science, as occurred in *Cammer*, and when other judges adopt the junk science, it can live on for

²⁷⁰ *Id.* at 2471.

²⁷¹ *See id.*

²⁷² *See Basic*, 485 U.S. at 258, 261.

²⁷³ *See id.* at 261.

²⁷⁴ *Miller v. Thane Int’l, Inc.*, 615 F.3d 1095, 1103 (9th Cir. 2010).

²⁷⁵ *But see id.* at 1103.

decades by force of precedential acceptance.²⁷⁶ But let any court ask a highly qualified and well-trained financial expert to produce a single peer-reviewed article unrelated to litigation and not written by a frequent expert witness, where that article concludes a market is inefficient or efficient based on trading volume, number of analyst reports, the presence of market makers, the eligibility of filing a Form S-3, or a history of price reactions to corporate events. No such article will be forthcoming. It does not exist. It does not exist because those are not reliable tests for distinguishing efficiency from inefficiency.

The birth and survival of the *Cammer* factors—so obviously unrelated to the financial economics of market efficiency—raise the question whether more such phenomena exist where a junk science that can prosper for decades because the parties to the litigation have distorted incentives to challenge the unreliable methodologies that are sometimes helpful for them. This more general phenomenon deserves study to see if it exists in other areas of litigation. The effort requires a substantial amount of domain knowledge on the methodology that is used and a knowledge of the applicable law, so it is well-suited to study by scholars trained in law and another discipline. Indeed, such insights ought to be a major contribution of scholars with such bi-disciplinary training.

For now, however, to borrow from Shakespeare: the next thing we do, let's kill all the *Cammer* factors.²⁷⁷

²⁷⁶ See *Willis v. Big Lots, Inc.*, No. 2:12-CV-604, 2017 WL 1074048, at *4 (S.D. Ohio Mar. 17, 2017) (“It may be that many financial economists, including Dr. Gompers, dispute the relevancy of the first four *Cammer* factors to a determination of market efficiency, but the *Cammer* factors nonetheless reflect the legal standard for market efficiency and have been considered by the Sixth Circuit in such determinations.”).

²⁷⁷ See *Krogman v. Sterritt*, 202 F.R.D. 467, 474 (N.D. Tex. 2001).