




2012

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Recommended Citation

Brian J. Boyle, *Bright-Line Rules and Inefficient Markets: The Third Circuit's 10b-5 Materiality Doctrine is Ripe for Revision*, 57 Vill. L. Rev. 683 (2012).

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2012]

Issues In The Third Circuit

BRIGHT-LINE RULES AND INEFFICIENT MARKETS: THE THIRD CIRCUIT'S 10b-5 MATERIALITY DOCTRINE IS RIPE FOR REVISION

BRIAN J. BOYLE*

I. INTRODUCTION

The efficient market hypothesis, popularized in the 1970s at the University of Chicago, holds that, “security prices fully reflect all available information.”¹ The Third Circuit has emphatically endorsed that idea, and rested its doctrine of Rule 10b-5 materiality squarely upon it.² Yet while the circuit continues to rely on the hypothesis, financial economics and behavioral science have advanced a more nuanced understanding of securities markets.³ As one *New York Times* columnist put it, “These days, you

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1. See Eugene F. Fama, *Efficient Capital Markets: II*, 46 J. FIN. 1575, 1575 (1991) (“I take the market efficiency hypothesis to be the simplest statement that security prices fully reflect all available information.”); see also *In re Merck & Co. Sec. Litig.*, 432 F.3d 261, 276 n.5 (3d Cir. 2005) (“We have defined an efficient market as that in which ‘information important to reasonable investors . . . is immediately incorporated into stock prices.’” (quoting *In re Burlington Coat Factory Sec. Litig.*, 114 F.3d 1410, 1425 (3d Cir. 1997))); Stephen J. Brown, *The Efficient Markets Hypothesis: The Demise of the Demon of Chance?*, 51 ACCT. & FIN. 80, 80 (2011) (describing early efficient market hypothesis research); Eugene F. Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25 J. FIN. 383, 383 (1970) (introducing efficient market hypothesis).

2. See, e.g., *In re Merck & Co.*, 432 F.3d at 269 (“Our Court, as compared to the other courts of appeals, has one of the ‘clearest commitments’ to the efficient market hypothesis.”); *In re NAHC, Inc. Sec. Litig.*, 306 F.3d 1314, 1330 (3d Cir. 2002) (“In . . . an efficient market, the concept of materiality translates into information that alters the price of the firm’s stock.” (quoting *In re Burlington Coat Factory*, 114 F.3d at 1425)).

3. See, e.g., Burton G. Malkiel, *The Efficient Market Hypothesis and Its Critics*, 17 J. ECON. PERSP. 59, 59 (2003) (“A generation ago, the efficient market hypothesis was widely accepted by academic financial economists It was generally believed that securities markets were extremely efficient in reflecting information about individual stocks and about the stock market as a whole.”); *id.* at 60 (“By the start of the twenty-first century, the intellectual dominance of the efficient market hypothesis had become far less universal.”); Robert J. Shiller, *Stock Prices and Social Dynamics*, 1984 BROOKINGS PAPERS ON ECON. ACTIVITY 457, 459 (calling one primary

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would be hard-pressed to find anybody, even on the University of Chicago campus, who would claim that the market is perfectly efficient.”⁴

The Third Circuit does not simply apply efficient market principles to aid its analysis; that would be problematic enough.⁵ Rather, the court has fashioned the stock-price test—a bright-line rule—which makes the perceived stock market response to information dispositive of materiality.⁶ Any such bright-line rule is contrary to the Supreme Court’s edict, reaffirmed in 2011, that judging 10b-5 materiality requires a case-by-case factual inquiry.⁷ Simply put, no categorical, bright-line rule can define materiality, much less a bright-line rule premised on an outmoded financial theory.⁸

This Article argues that the stock-price test is ripe for revision, and that Third Circuit practitioners should advocate for a materiality doctrine that is better grounded in Supreme Court precedent and a modern conception of securities markets. Part II examines Securities and Exchange Commission (SEC) Rule 10b-5 and Supreme Court jurisprudence on the rule’s materiality requirement, including the Court’s 2011 decision in *Matrixx Initiatives, Inc. v. Siracusano*,⁹ which eliminated any question as to the impropriety of bright-line materiality rules.¹⁰ Part III traces the develop-

justification for efficient market hypothesis “one of the most remarkable errors in the history of economic thought”).

4. Joe Nocera, *Poking Holes in a Theory on Markets*, N.Y. TIMES (June 5, 2009), <http://www.nytimes.com/2009/06/06/business/06nocera.html?pagewanted=all> (discussing market inefficiency).

5. For a discussion of the weaknesses in efficient market hypothesis, see *infra* notes 107–78 and accompanying text.

6. See, e.g., *Oran v. Stafford*, 226 F.3d 275, 283 (3d Cir. 2000) (“[P]rice stability is dispositive of the question of materiality.”). For a discussion of this rule, including its development and its reliance on the efficient market hypothesis, see *infra* notes 56–106.

7. See, e.g., *Matrixx Initiatives, Inc. v. Siracusano*, 131 S. Ct. 1309, 1318 (2011) (“[Materiality is] an inherently fact-specific finding” (quoting *Basic Inc. v. Levinson*, 485 U.S. 224, 236 (1988)) (internal quotations omitted)); *id.* at 1319–21 (conducting fact-specific inquiry addressed to what reasonable investors would have considered while eschewing reliance on statistical significance of information).

8. See *id.* at 1318 (“The defendant urged a bright-line rule We observed that any approach that designates a single fact or occurrence as always determinative of an inherently fact-specific finding such as materiality, must necessarily be overinclusive or underinclusive. We thus rejected the defendant’s proposed rule” (quoting *Basic*, 485 U.S. at 232–36) (internal quotations and citations omitted)); *id.* at 1319 (“As in *Basic*, *Matrixx*’s categorical rule would artificially exclude information that would otherwise be considered significant to the trading decision of a reasonable investor.” (quoting *Basic*, 485 U.S. at 236) (internal quotations omitted)). *Id.* at 1321 (“The question remains whether a *reasonable* investor would have viewed the nondisclosed information as having significantly altered the total mix of information made available.” (quoting *Basic*, 485 U.S. at 232) (internal quotations omitted)).

9. 131 S. Ct. 1309 (2011).

10. For a discussion of Rule 10b-5, and the Supreme Court’s jurisprudence on bright-line 10b-5 materiality rules, see *infra* notes 14–55 and accompanying text.

ment of the Third Circuit's materiality doctrine, from its genesis to its clear emergence as a bright-line rule, and its unflinching embrace of the efficient market hypothesis.¹¹ Part IV surveys the critical weaknesses in the efficient market hypothesis, juxtaposing the unqualified faith in the hypothesis avowed by the Third Circuit with the far more skeptical view that is now characteristic of the finance discipline.¹² Finally, Part V concludes with recommendations for Third Circuit advocacy.¹³

II. RULE 10B-5 AND ITS MATERIALITY ELEMENT

Rule 10b-5 is a cornerstone of securities regulation, and as one commentator put it, "can make a plausible claim to being the most consequential piece of American administrative law."¹⁴ The rule provides grounds for both the government and private plaintiffs to pursue claims of securities fraud.¹⁵ In both cases, materiality is a principal element.¹⁶ The Supreme Court has been explicit about the meaning of materiality in this context and has emphasized careful factual inquiries, while criticizing bright-line tests.¹⁷ Indeed, after the Court's 2011 opinion in *Matrixx Initiatives*, it is clear that bright-line tests are "necessarily" unsuitable for the analysis of 10b-5 materiality.¹⁸

A. Rule 10b-5 Generally

The Securities Exchange Act of 1934 prohibits the use "in connection with the purchase or sale of any security . . . [of] any manipulative or deceptive device or contrivance. . . ."¹⁹ SEC Rule 10b-5 implements that portion of the Act by stating, in pertinent part, "It [is] unlawful to . . . make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the

11. For a detailed discussion of the stock-price test, see *infra* notes 56–106 and accompanying text.

12. For a summary of the case against the efficient market hypothesis, and an argument that the hypothesis is ill-suited for use in legal doctrines, see *infra* notes 107–78 and accompanying text.

13. For a brief discussion of implications for Third Circuit advocacy, see *infra* notes 179–88 and accompanying text.

14. See Samuel W. Buell, *What Is Securities Fraud?*, 61 DUKE L.J. 511, 540–41 (2011) (discussing great significance of Rule 10b-5).

15. See *id.* at 543–44 (providing overview of law of securities fraud).

16. See *id.* at 545–46 (discussing elements of 10b-5 causes of action).

17. For a further discussion of the Supreme Court's materiality jurisprudence, see *infra* notes 27–55 and accompanying text. For a discussion specifically addressing the Court's repudiation of the bright-line tests for 10b-5 materiality, see *infra* notes 37–55 and accompanying text.

18. See *Matrixx Initiatives, Inc. v. Siracusano*, 131 S. Ct. 1309, 1318 (2011) ("[A]ny approach that designates a single fact or occurrence as always determinative of an inherently fact-specific finding such as materiality, must necessarily be overinclusive or underinclusive." (quoting *Basic Inc. v. Levinson*, 485 U.S. 224, 236 (1988)) (internal quotations and citations omitted)).

19. See Securities Exchange Act of 1934 § 10(b), 15 U.S.C. § 78j(b) (2006).

circumstances under which they were made, not misleading.”²⁰ That sparse language has spawned an extensive and complex jurisprudence.²¹

The rule provides for SEC civil litigation, and also serves as a basis for a judicially-implied private right of action, among other things.²² The elements of the private right of action are: “(1) a material misrepresentation (or omission); (2) scienter, i.e., a wrongful state of mind; (3) a connection with the purchase or sale of a security; (4) reliance; (5) economic loss; and (6) loss causation, i.e., a causal connection between the material misrepresentation and the loss.”²³ The government’s burden is typically somewhat lighter in that it need not establish the elements of reliance, economic loss, and causation.²⁴ The SEC need only show, “a material misrepresentation (or omission); scienter . . . [and] a connection with the purchase or sale of a security”²⁵ In both instances, the materiality element is tremendously important.²⁶

B. Materiality Defined

As the Supreme Court has observed, Congress’s motivation for enacting securities laws “was to substitute a philosophy of full disclosure for the philosophy of caveat emptor . . . in the securities industry.”²⁷ Nevertheless, the Court has historically expressed concern that construing Rule 10b-5 too broadly would allow executives to “bury the shareholders in an

20. See *Matrixx Initiatives*, 131 S. Ct. at 1317 (quoting 17 C.F.R. § 240.10b-5(b)).

21. As Chief Justice Rehnquist once wrote, Rule 10b-5 jurisprudence is “a judicial oak which has grown from little more than a legislative acorn.” See *Blue Chip Stamps v. Manor Drug Stores*, 421 U.S. 723, 737 (1975) (discussing law of securities fraud).

22. See Buell, *supra* note 14, at 543–44 (“Private plaintiffs may only bring lawsuits under Rule 10b-5 and may only seek damages. . . . The SEC may bring administrative actions or lawsuits under both Rule 10b-5 and Section 17 [of the Securities Act of 1933].”). Buell provides a very helpful overview of the Rule 10b-5, including both private plaintiff and SEC actions. See *id.* at 544.

23. See *id.* at 545 (quoting *Dura Pharm., Inc. v. Broudo*, 544 U.S. 336, 341–42 (2005)) (internal quotations omitted); see also *Matrixx Initiatives*, 131 S. Ct. at 1317–18 (listing elements of private right of action under Rule 10b-5). Additionally, “Under the Private Securities Litigation Reform Act of 1995 (PSLRA), when a plaintiff’s claim is based on alleged misrepresentations or omissions of a material fact, ‘the complaint shall specify each statement alleged to have been misleading, [and] the reason or reasons why the statement is misleading.’” *Matrixx Initiatives*, 131 S. Ct. at 1318 n.4 (alteration in original) (quoting 15 U.S.C. § 78u-4(b)(1)).

24. See Buell, *supra* note 14, at 546 (“The elements of SEC regulatory actions vary from this scheme in the following ways: The fourth, fifth, and sixth elements mostly fall away.”).

25. See *id.* at 545–46 (internal quotation marks omitted) (describing elements of private right of action, then listing those which are not required for SEC action).

26. For a broad and useful primer on materiality, see COX ET AL., *SECURITIES REGULATION: CASES AND MATERIALS* 585–687 (6th ed. 2009).

27. See *Sec. & Exch. Comm’n v. Capital Gains Research Bureau, Inc.*, 375 U.S. 180, 186 (1963) (citing H.R. REP. NO. 73-85, at 2 (1933)).

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avalanche of trivial information—a result that is hardly conducive to informed decisionmaking.”²⁸ The ambit of Rule 10b-5 is limited in that it regulates only material information.²⁹ Moreover, even with respect to material information, the rule requires only that material information be disclosed when necessary to render statements already made not misleading.³⁰

The Supreme Court has been very clear about what makes information material.³¹ In *TSC Industries, Inc. v. Northway, Inc.*,³² the Supreme Court addressed materiality in the context of a proxy solicitation, and equated it with importance to a “reasonable shareholder.”³³ Then in *Basic Inc. v. Levinson*,³⁴ the Court endorsed the *TSC Industries* definition and applied it to the Rule 10b-5 context generally.³⁵ Thus, for information to be material “there must be a substantial likelihood that the disclosure of

28. See *Basic Inc. v. Levinson*, 485 U.S. 224, 231 (1988) (quoting *TSC Indus. v. Northway, Inc.*, 426 U.S. 438, 448–49 (1976)).

29. See 17 C.F.R. § 240.10b–5(b) (1951) (“It shall be unlawful for any person . . . [t]o make any untrue statement of a *material* fact or to omit to state a *material* fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading” (emphasis added)). Materiality exists on a spectrum between the mere potential for information to be relevant and empirical proof that the information is in fact relevant. *Cf. Matrixx Initiatives*, 131 S. Ct. at 1321 (“[T]he mere existence of reports of adverse events . . . will not satisfy this standard. Something more is needed This contextual inquiry may reveal in some cases that reasonable investors would have viewed reports of adverse events as material even [absent statistical significance].”). Notably, courts have not been entirely consistent in their interpretation of what exactly the term “material” modifies. Compare *Greenhouse v. MCG Capital Corp.*, 392 F.3d 650, 656 (4th Cir. 2004) (“‘Material’ modifies ‘fact’; it does not modify ‘misrepresentation.’ . . . [10b-5] do[es] *not* prohibit *any* misrepresentation—no matter how willful, objectionable, or flatly false—of *im* material facts” (quoting 17 C.F.R. § 240.10b–5(b))), with *In re Burlington Coat Factory Sec. Litig.*, 114 F.3d 1410, 1417 (3d Cir. 1997) (phrasing materiality requirement as though “materially” might modify “false” as well).

30. See *Matrixx Initiatives*, 131 S. Ct. at 1321–22 (“[I]t bears emphasis that § 10(b) and Rule 10b–5(b) do not create an affirmative duty to disclose any and all material information. Disclosure is required under these provisions only when necessary ‘to make . . . statements made, in the light of the circumstances under which they were made, not misleading.’” (quoting 17 C.F.R. § 240.10b–5(b))).

31. See *Basic*, 485 U.S. at 231 (“The Court also explicitly has defined a standard of materiality under the securities laws”).

32. 426 U.S. 438 (1976).

33. See *id.* at 449 (“An omitted fact is material if there is a substantial likelihood that a reasonable shareholder would consider it important in deciding how to vote.”). For evidence of the *TSC Industries* standard’s importance to later articulations of materiality, see, for example, *Basic*, 485 U.S. at 232 (“We now expressly adopt the *TSC Industries* standard of materiality for the § 10(b) and Rule 10b-5 context.”); *Oran v. Stafford*, 226 F.3d 275, 282 (3d Cir. 2000) (discussing test for 10b-5 materiality).

34. 485 U.S. 224 (1988).

35. *Id.* at 232 (“We now expressly adopt the *TSC Industries* standard of materiality for the § 10(b) and Rule 10b-5 context.”).

the omitted fact would have been viewed by the reasonable investor as having significantly altered the total mix of information made available.”³⁶

C. *Materiality Analysis*

“Materiality is a mixed question of law and fact, and the delicate assessments of the inferences a reasonable shareholder would draw from a given set of facts are peculiarly for the trier of fact.”³⁷ The *Basic* Court was faced with a challenging set of facts, and the application of the *TSC Industries* test was far from straightforward. Even so, the Court performed a delicate, fact-sensitive assessment, and rejected bright-line tests.³⁸

The difficulty in *Basic* was that the allegedly misleading information was speculative; it concerned a company’s plans for a potential—as opposed to certain—merger. As the Court explained,

Where the impact of the corporate development on the target’s fortune is certain and clear, the *TSC Industries* materiality definition admits straightforward application. Where, on the other hand, the event is contingent or speculative in nature, it is difficult to ascertain whether the “reasonable investor” would have considered the omitted information significant at the time. Merger negotiations, because of the ever-present possibility that the contemplated transaction will not be effectuated, fall into the latter category.³⁹

To manage that complexity, the petitioners urged the court to adopt a bright-line test, which had theretofore been employed by the Third Circuit.⁴⁰ The test made the existence of an “agreement-in-principle as to the price and structure of the transaction” dispositive of materiality.⁴¹

The Court carefully considered three proffered rationales for the particular rule, and rejected them in turn.⁴² More importantly, the Court stated in no uncertain terms that bright-line rules are necessarily ill-suited to determinations of materiality under Rule 10b-5.⁴³ As the Court put it, “Any approach that designates a single fact or occurrence as always deter-

36. See *id.* at 231–32 (quoting *TSC Industries*, 426 U.S. at 449) (internal quotations omitted).

37. See *Shapiro v. UJB Fin. Corp.*, 964 F.2d 272, 280 n.11 (3d Cir. 1992) (citing *TSC Industries*, 426 U.S. at 450) (discussing role of trier of fact in assessing materiality).

38. See *Basic*, 485 U.S. at 232 (“The application of this materiality standard to preliminary merger discussions is not self-evident.”); *id.* (conducting fact-sensitive inquiry).

39. See *id.*

40. See *id.* at 232–33.

41. See *id.* at 233.

42. See *id.* at 234–36 (rejecting interests of investors, interests of management, and judicial economy as justifications for applying the bright-line materiality rule).

43. See *id.* at 236 (cautioning, in very strong language, lower courts against use of bright-line rules in this context).

minative of an inherently fact-specific finding such as materiality, *must necessarily* be overinclusive or underinclusive.”⁴⁴

Instead of relying on bright-line rules, the Court weighed the particular characteristics of the information at issue in the context of the “total mix of information.”⁴⁵ The Court considered the likelihood of the event, in that case a potential merger, and the magnitude of the effect on the company were the event to occur, in that case tremendous.⁴⁶ Additionally, the Court emphasized that the fact-sensitive analysis applies broadly, regardless of “who brings the action or whether insiders are alleged to have profited.”⁴⁷

The Court’s disapproval of bright-line tests for 10b-5 materiality could hardly have been clearer. Accordingly, the Second Circuit later held, “Following *Basic*, we have consistently rejected a formulaic approach to assessing the materiality of an alleged misrepresentation.”⁴⁸ Similarly, the

44. *See id.* at 236 (emphasis added); *see also* *Matrixx Initiatives, Inc. v. Siracusano*, 131 S. Ct. 1309, 1318 (2011) (quoting that language from *Basic*). The *Basic* Court pointed out that Congress had addressed this issue and cautioned the SEC against adopting a bright-line materiality rule: “The materiality concept is judgmental in nature and it is not possible to translate this into a numerical formula. The Committee’s advice to the [SEC] is to avoid this quest for certainty and to continue consideration of materiality on a case-by-case basis as disclosure problems are identified.” *Basic*, 485 U.S. at 236 n.14 (alteration original) (quoting House Committee on Interstate and Foreign Commerce, Report of the Advisory Committee on Corporate Disclosure to the Securities and Exchange Commission, 95th Cong., 1st Sess., 327 (Comm. Print 1977)). To quote *Basic*, “Courts also would do well to heed this advice.” *Id.* at 236.

45. *See Matrixx Initiatives*, 131 S. Ct. at 1321 (“The question remains whether a *reasonable* investor would have viewed the nondisclosed information as having *significantly* altered the total mix of information made available.” (quoting *Basic*, 485 U.S. at 232) (internal quotations omitted)).

46. *See Basic*, 485 U.S. at 238 (“Since a merger in which it is bought out is the most important event that can occur in a small corporation’s life . . . we think that inside information, as regards a merger of this sort, can become material at an earlier stage than would be the case as regards lesser transactions . . .” (quoting *SEC v. Geon Indus., Inc.*, 531 F.2d 39, 47–48 (2d Cir. 1976))).

47. *See id.* at 240 n.18 (extending holding beyond facts of case). The court said, “We find no authority in the statute, the legislative history, or our previous decisions for varying the standard of materiality depending on who brings the action or whether insiders are alleged to have profited.” *Id.* (citing *Pavlidis v. New England Patriots Football Club, Inc.*, 737 F.2d 1227, 1231 (1st Cir. 1984)). Further reinforcing the broad applicability of the test, the *Basic* court stated, “We are not prepared to agree, however, that ‘[i]n cases of the disclosure of inside information to a favored few, determination of materiality has a different aspect than when the issue is, for example, an inaccuracy in a publicly disseminated press release.’” *Id.* (quoting *Geon Indus.*, 531 F.2d at 48). It is not argued here that the specific probability/magnitude analysis should apply to all cases; this Article leaves that question untouched. However, that test is illustrative of the type of nuanced, fact-sensitive analysis that *Basic* demands. *See id.* at 231–32.

48. *See Ganino v. Citizens Utils. Co.*, 228 F.3d 154, 162 (2d Cir. 2000) (endorsing multi-factor materiality analysis); *see also* *Geiger v. Solomon-Page Grp.*, 933 F. Supp. 1180, 1188 (S.D.N.Y. 1996) (“Evidence of stock price movement may be relevant to the issue of materiality but it is not determinative.”).

Ninth Circuit expressly declined to adopt a bright-line rule “because adoption of such a rule would contravene the Supreme Court’s holdings in [*Basic*] and [*TSC Industries*].”⁴⁹ Even so, some other lower courts, including the Third Circuit, read *Basic* differently and developed bright-line tests for 10b-5 materiality.⁵⁰

Whatever doubt the *Basic* opinion once allowed as to the impropriety of bright-line rules for 10b-5 materiality, the Supreme Court’s 2011 *Matrixx Initiatives* opinion made the matter eminently clear.⁵¹ “Like the defendant in *Basic*, Matrixx [advocated for] a bright-line rule”—in this case, one based on the statistical significance of the information at issue.⁵² The Court, again citing *Basic*, rejected that idea and called instead for a “fact specific inquiry . . . that requires consideration of the source, content, and context of the [information]. This is not to say that statistical significance (or the lack thereof) is irrelevant—only that it is not dispositive of every case.”⁵³ Furthermore, the *Matrixx Initiatives* Court reiterated the *Basic* Court’s holding that any single-factor test for 10b-5 materiality “must necessarily be overinclusive or underinclusive.”⁵⁴ Neither statistical significance, nor any other single factor, is coterminous with materiality.⁵⁵

49. See No. 84 Emp’r-Teamster Joint Council Pension Trust Fund v. Am. W. Holding Corp., 320 F.3d 920, 934 (9th Cir. 2003) (rejecting bright-line rules for 10b-5 materiality as contrary to Supreme Court precedent). Generally speaking, most circuits that considered the issue likewise avoided bright-line materiality rules. See *Greenhouse v. MCG Capital*, 392 F.3d 650, 660–61 (4th Cir. 2004) (“The majority rule seems to be that [a stock’s price history] can be *some* evidence, but not, standing alone, *dispositive* evidence.”); see also *Ventas, Inc. v. HCP, Inc.*, 647 F.3d 291, 316 (6th Cir. 2011), *cert. dismissed*, 132 S. Ct. 572 (2011) (rejecting Third Circuit’s test and considering range of factors); *City of Monroe Emps. Ret. Sys. v. Bridgestone Corp.*, 399 F.3d 651, 669 (6th Cir. 2005) (endorsing “fact-intensive” test for materiality); *Media Gen., Inc. v. Tomlin, Jr.*, 387 F.3d 865, 869 (D.C. Cir. 2004) (looking to totality of information); *Romine v. Acxiom Corp.*, 296 F.3d 701, 710–11 (8th Cir. 2002) (considering multiple factors, including type of information and apparent attendant change in stock price); *Phillips v. LCI Int’l*, 190 F.3d 609, 614 (4th Cir. 1999) (endorsing fact-specific inquiry); *Rowe v. Maremont Corp.*, 850 F.2d 1226, 1234–36 (7th Cir. 1988) (endorsing and conducting multi-factor analysis).

50. See, e.g., *ABC Arbitrage Plaintiffs Grp. v. Tchuruk*, 291 F.3d 336, 361 (5th Cir. 2002) (endorsing bright-line test enunciated by Third Circuit). For a further discussion of the origin, application, and characteristics of the Third Circuit’s materiality standard, see *infra* notes 56–106 and accompanying text. Cf. *Shaw v. Digital Equip. Corp.*, 82 F.3d 1194, 1218 (1st Cir. 1996) (emphasizing same single factor), *superseded by statute*, 15 U.S.C. § 78u-4(b)(1)-(2) (1997), *as recognized in* *Plumbers’ Union Local No. 12 Pension Fund v. Nomura Asset Acceptance Corp.*, 632 F.3d 762 (1st Cir. 2011).

51. See *Matrixx Initiatives, Inc. v. Siracusano*, 131 S. Ct. 1309, 1318–19 (2011) (criticizing bright-line rules for materiality).

52. See *id.*

53. See *id.* at 1321 (internal quotation marks omitted).

54. *Id.* at 1318 (quoting *Basic Inc. v. Levinson*, 485 U.S. 224, 236 (1988)) (rejecting bright-line tests for 10b-5 materiality).

55. See *id.* at 1318 (“[A]ny approach that designates a single fact or occurrence as always determinative of an inherently fact-specific finding such as materiality, must necessarily be overinclusive or underinclusive.” (emphasis added) (quoting *Ba-*

III. THE THIRD CIRCUIT'S BRIGHT-LINE RULE

Rather than follow *Basic*, the Third Circuit fashioned a bright-line rule for materiality.⁵⁶ What's more, it grounded that rule entirely in the efficient market hypothesis.⁵⁷ The stock-price test, which the Circuit developed in a line of cases stretching from *In re Burlington Coat Factory Securities Litigation*⁵⁸ in 1997, to *United States v. Schiff*⁵⁹ in 2010, makes materiality entirely dependent upon an analysis of the stock market's apparent reaction to the information at issue.⁶⁰

A. *The Genesis of the Stock-Price Test*

The Third Circuit first announced the doctrine, since referred to as the stock-price test, in its 1997 opinion in *Burlington*.⁶¹ The court acknowledged the materiality standard prescribed by the Supreme Court.⁶² Yet it held that, where companies with publicly traded stocks are concerned, a

sic, 485 U.S. at 236)); *cf. id.* at 1318–19 (“Matrixx’s categorical rule would artificially exclud[e] information that would otherwise be considered significant A lack of statistically significant data does not mean that medical experts have no reliable basis for inferring a causal link between a drug and adverse events.” (alteration in original) (internal quotations omitted)).

By way of clarifying the boundaries of this argument, it should be added that *Matrixx* does not impact the validity of the “bespeaks caution” doctrine. “At bottom, the ‘bespeaks caution’ doctrine stands for the ‘unremarkable proposition that statements must be analyzed in context’ when determining whether or not they are materially misleading.” *Grossman v. Novell, Inc.*, 120 F.3d 1112, 1120 (10th Cir. 1997) (quoting *Rubinstein v. Collins*, 20 F.3d 160, 167 (5th Cir. 1994)). At minimum, that fact-sensitive analysis and consideration of context clearly distinguish the “bespeaks caution” doctrine from the single-factor tests that have attracted rebuke from the Supreme Court. For a discussion of the Court’s jurisprudence on materiality, see *infra* notes 37–55 and accompanying text.

56. For a discussion of the stock-price test, see *infra* notes 61–76 and accompanying text.

57. For a further discussion of the Third Circuit’s extraordinary reliance on the efficient market hypothesis, see *infra* notes 84–106 and accompanying text.

58. 114 F.3d 1410 (3d Cir. 1997).

59. 602 F.3d 152 (3d Cir. 2010).

60. *See id.* at 171 (discussing stock-price test); *Burlington*, 114 F.3d at 1425 (equating price stability with immateriality as a matter of law); *see also* No. 84 Emp’r-Teamster Joint Council Pension Trust Fund v. Am. W. Holding Corp., 320 F.3d 920, 934 (9th Cir. 2003) (describing Third Circuit materiality doctrine as bright-line rule).

61. *See Burlington*, 114 F.3d at 1425 (“Because the market for BCF stock was ‘efficient’ and because the July 29 disclosure had no effect on BCF’s price, it follows that the information disclosed on September 20 was immaterial as a matter of law.”); *see also In re Merck & Co. Sec. Litig.*, 432 F.3d 261, 274 (3d Cir. 2005) (using stock-price test terminology).

62. *See Burlington*, 114 F.3d at 1425 (“Ordinarily, the law defines ‘material’ information as information that would be important to a reasonable investor in making his or her investment decision.” (citing *In re Westinghouse Sec. Litig.*, 90 F.3d 696, 714 (3d Cir. 1996))).

special rule should apply: information is material if it affects the price of the company's stock in the public market.⁶³

The *Burlington* court developed the stock-price test from the *Basic* Court's doctrine of reliance, known as the fraud-on-the-market theory.⁶⁴ In nascent 10b-5 class actions, certification under Rule 23(b)(3) "often turns on the element of reliance."⁶⁵ To facilitate class certification, the *Basic* Court held that a 10b-5 plaintiff need not have had actual knowledge of a company's statement to demonstrate reliance.⁶⁶ Rather, the Court endorsed a rebuttable presumption premised explicitly on the efficient market hypothesis.⁶⁷ The Court reasoned, "Because the market transmits information to the investor in the processed form of a market price, we can assume . . . that an investor relies on public misstatements whenever he buys or sells stock at the price set by the market."⁶⁸

Although the Court accepted the fraud-on-the-market theory of reliance, it did not wholeheartedly embrace the efficient market hypothesis.⁶⁹ Moreover, the *Basic* Court's analysis of reliance was formally separate and logically distinct from its analysis of materiality.⁷⁰ As expounded on

63. *See id.* ("In the context of an 'efficient' market, the concept of materiality translates into information that alters the price of the firm's stock."). The court held that in an efficient market, the market is in effect the reasonable investor. *See id.* "Therefore, to the extent that information is not important to reasonable investors, it follows that its release will have a negligible effect on the stock price." *Id.*

64. *See id.* (relying primarily on fraud-on-the-market cases for support).

65. *See* *Erica P. John Fund, Inc. v. Halliburton Co.*, 131 S. Ct. 2179, 2184 (2011) ("Whether common questions of law or fact predominate in a securities fraud action often turns on the element of reliance.").

66. *See* *Basic Inc. v. Levinson*, 485 U.S. 224, 242–45 (1988) (discussing fraud-on-the-market presumption).

67. *See* *Erica P. John Fund*, 131 S. Ct. at 2185 ("The Court in *Basic* sought to alleviate those related concerns by permitting plaintiffs to invoke a rebuttable presumption of reliance based on what is known as the 'fraud-on-the-market' theory.>").

68. *See id.* (quoting *Basic*, 485 U.S. at 244–46) (internal quotations omitted) (explaining rationale for presumption of reliance).

69. *See* *Basic*, 485 U.S. at 246 n.24 ("We need not determine by adjudication what economists and social scientists have debated [W]e need only believe that market professionals generally consider most publicly announced material statements about companies, thereby affecting stock market prices."). Indeed, "[the Court did] not intend conclusively to adopt any particular theory of how quickly and completely publicly available information is reflected in market price." *Id.* at 248 n.28 (avoiding any judgment about market efficiency). Rather, the Court accepted the fraud-on-the-market theory because it was a useful means to achieving important policy goals and furthering Congress's intent. *See id.* at 245–46 ("Arising out of considerations of fairness, public policy, and probability, as well as judicial economy . . . [and] the congressional policy embodied in the 1934 Act."); *see also* *Millowitz v. Citigroup Global Mkts., Inc.* (*In re* *Salomon Analyst Metromedia Litig.*), 544 F.3d 474, 483 (2d Cir. 2008) ("In a pivotal passage, the Court stated that the presumption was justified not by scientific certainty, but by considerations of fairness, probability, judicial economy, congressional policy, and common sense." (citing *Basic*, 485 U.S. at 245–46)).

70. *Compare* *Basic*, 485 U.S. at 231–41 (analyzing materiality), *with id.* at 241–49 (analyzing reliance). The Court in *Basic* confronted two issues: materiality

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above, the Court analyzed materiality with a factual inquiry into the likelihood of the relevant event and its magnitude should it occur.⁷¹ In doing so, the Court relied on neither the fraud-on-the-market theory nor efficient market principles generally.⁷²

Nevertheless, by the time the Third Circuit ruled in *Burlington*, a few courts had begun to develop a sort of fraud-on-the-market theory of materiality.⁷³ The reasoning was that, because the fraud-on-the-market theory replaces the “reasonable investor” with the market, materiality should be judged based on whether the market responds to a given piece of information.⁷⁴ This view conflates materiality and reliance, or in other words, “[the fraud-on-the-market theory] collapse[s] into the reasonable investor

and reliance. See *Basic*, 485 U.S. at 226 (“This case requires us to apply the materiality requirement We must also determine whether a person who traded a corporation’s shares on a securities exchange after the issuance of a materially misleading statement by the corporation may invoke a rebuttable presumption that, in trading, he relied on the integrity of the price set by the market.”); see also *In re Salomon Analyst Metromedia Litig.*, 544 F.3d at 482–83 (“*Basic* was a two-part opinion. In the first part of the opinion, the *Basic* Court undertook to explain the meaning of ‘material’ In the second part of the opinion, the *Basic* Court drew on this fair and manageable definition of materiality to devise a method of establishing *reliance*”).

71. For a further discussion of the fact-specific inquiry into materiality, see *supra* notes 37–55 and accompanying text.

72. See *Basic*, 485 U.S. at 231–41 (analyzing materiality without reference to efficient market hypothesis or fraud-on-the-market theory).

73. See *Shaw v. Digital Equip. Corp.*, 82 F.3d 1194, 1218 (1st Cir. 1996) (“In such cases, the statements identified by plaintiffs as actionably misleading are alleged to have caused injury, if at all, not through the plaintiffs’ direct reliance upon them, but by dint of the statements’ inflating effect on the market price of the security purchased.” (citing *Basic*, 485 U.S. at 241–47)), *superseded by statute*, 15 U.S.C. § 78u-4(b)(1)-(2) (1997), as recognized in *Plumbers’ Union Local No. 12 Pension Fund v. Nomura Asset Acceptance Corp.*, 632 F.3d 762 (1st Cir. 2011); see also *Raab v. Gen. Physics Corp.*, 4 F.3d 286, 289 (4th Cir. 1993) (“The other source in this case was the press release; if the contracting slowdown was material, the market was aware of it, and the price of the shares reflected it.” (internal quotations omitted)).

74. The *Shaw* court clearly explained how the fraud-on-the-market rationale led it to its efficient market hypothesis conception of materiality:

This presumption of investor reliance on the integrity of stock prices has the primary effect of obviating the need for plaintiff purchasers to plead individual reliance. But by its underlying rationale, the presumption also shifts the critical focus of the materiality inquiry. In a fraud-on-the-market case the hypothetical ‘reasonable investor,’ by reference to whom materiality is gauged, must be ‘the market’ itself, because it is the market, not any single investor, that determines the price of a publicly traded security.

Shaw, 82 F.3d at 1218 (translating fraud-on-the-market theory to materiality). The *Burlington* court cited to that page of the *Shaw* opinion in support of its assertion that, “[i]n the context of an ‘efficient’ market, the concept of materiality translates into information that alters the price of the firm’s stock.” See *In re Burlington Coat Factory Sec. Litig.*, 114 F.3d 1410, 1425 (3d Cir. 1997) (citing *Shaw*, 82 F.3d at 1218 (creating stock price rule)).

standard for materiality.”⁷⁵ Similarly, the Third Circuit in *Burlington* took the *Basic* Court’s reliance reasoning and applied it to materiality, thereby creating the circuit’s stock-price test.⁷⁶

B. A Bright-Line Rule

A few years after *Burlington*, the *Oran v. Stafford*⁷⁷ court removed any question as to whether the stock-price test was to be applied as a bright-line rule.⁷⁸ The court held that “if a company’s disclosure of information has no effect on stock prices, ‘it follows that the information disclosed . . . was immaterial as a matter of law.’”⁷⁹ Despite the Supreme Court’s repeated guidance to avoid using bright-line materiality rules, the Third Circuit held, “price stability is dispositive of the question of materiality.”⁸⁰

The application of a bright-line rule to materiality is contrary to Supreme Court precedent.⁸¹ Nevertheless, in the line of cases that followed *Burlington* and *Oran*, the Third Circuit continued to treat the stock-price test as dispositive, and also called attention to a second, arguably more severe problem with the test: it relies entirely on an outmoded conception of financial markets.⁸² Unfortunately, as Justice White warned in his partial dissent in *Basic*, “Confusion and contradiction in court rulings are in-

75. No. 84 Emp’r-Teamster Joint Council Pension Tr. Fund v. Am. W. Holding Corp., 320 F.3d 920, 947 (9th Cir. 2003) (Tallman, J., dissenting) (alteration in original) (internal quotation marks omitted) (“[T]o invoke the fraud-on-the-market theory . . . [h]ow a reasonable investor would judge a stock’s value based on misinformation collapse[s] into the reasonable investor standard for materiality. They are not separate and unrelated concepts in securities law.” (alteration in original)). Some commentators, motivated by an efficient market conception of securities fraud, have argued that these elements should be considered as one. See Daniel R. Fischel, *Use of Modern Finance Theory in Securities Fraud Cases Involving Actively Traded Securities*, 38 BUS. LAW. 1, 13 (1982) (considering elements as one); see also Mark L. Mitchell & Jeffrey M. Netter, *The Role of Financial Economics in Securities Fraud Cases: Applications at the Securities and Exchange Commission*, 49 BUS. LAW. 545, 546–47 (1994) (discussing Fischel’s article).

76. Cf. *In re Burlington Coat Factory*, 114 F.3d at 1425 (“Because the market for BCF stock was ‘efficient’ and because the July 29 disclosure had no effect on BCF’s price, it follows that the information disclosed on September 20 was immaterial as a matter of law.”).

77. 226 F.3d 275 (3d Cir. 2000).

78. See *id.* at 282 (citing *Burlington*, 114 F.3d at 1425 (explaining stock-price test)).

79. See *id.* (quoting *Burlington*, 114 F.3d at 1425 (describing stock-price test)).

80. See *id.* at 283 (“As the District Court noted, the July 8 disclosure had no appreciable negative effect on the company’s stock price; in fact, AHP’s share price rose by \$3.00 during the four days after the Mayo disclosure. Under [the stock-price test], this price stability is dispositive of the question of materiality.”).

81. For a further discussion of the Supreme Court’s criticism of the bright-line 10b-5 materiality rules, see *supra* notes 43–47 and accompanying text.

82. For a summary of the weaknesses in the efficient market hypothesis, see *infra* notes 107–75 and accompanying text. See also Erica P. John Fund v. Halliburton Co., 131 S. Ct. 2179, 2185 (2011) (discussing market efficiency and need to demonstrate—when relying on market efficiency to show reliance—whether given change in stock price was due to information in controversy or some other factor).

evitable when traditional legal analysis is replaced with economic theorization by the federal courts.”⁸³

C. *Unqualified Faith in the Efficient Market Hypothesis*

In *Oran* and its progeny, the Third Circuit repeatedly emphasized its faith in the efficient market hypothesis.⁸⁴ For example, in *In re NAHC, Inc. Securities Litigation*,⁸⁵ the court considered the materiality of information that a company disclosed in a regulatory filing after allegedly delaying doing so.⁸⁶ The company asserted that the information at issue was immaterial as a matter of law.⁸⁷ The court agreed, reasoning that, because the information did not negatively affect the company’s stock price, it followed that the information was immaterial.⁸⁸ That conclusion was predicated on the court’s holding that, “In . . . an ‘efficient’ market, the concept of materiality translates into information that alters the price of the firm’s stock.”⁸⁹

Similarly, in *In re Merck & Co. Securities Litigation*,⁹⁰ the Third Circuit considered whether the disclosure of certain revenue calculations prior to

83. *Basic Inc. v. Levinson*, 485 U.S. 224, 252 (1988) (White, J., dissenting in part) (criticizing majority’s reliance on efficient market hypothesis).

84. As the *Oran* court discussed the stock-price test, it made eminently clear that the test was premised on total faith in market efficiency. *See Oran*, 226 F.3d at 282 (explaining stock-price test and its roots in efficient market hypothesis). The court’s reasoning on this point is worth quoting at length:

In *Burlington*, however, this Court fashioned a special rule for measuring materiality in the context of an efficient securities market. This rule was shaped by the basic economic insight that in an open and developed securities market like the New York Stock Exchange, the price of a company’s stock is determined by all available material information regarding the company and its business. In such an efficient market, “information important to reasonable investors . . . is immediately incorporated into the stock price.” As a result, when a stock is traded in an efficient market, the materiality of disclosed information may be measured post hoc by looking to the movement, in the period immediately following disclosure, of the price of the firm’s stock.

Id. (quoting *Burlington*, 114 F.3d at 1425) (internal citations omitted).

85. 306 F.3d 1314 (3d Cir. 2002).

86. *See id.* at 1330 (“Appellants . . . allege that Wasserstein fraudulently omitted material information regarding the loss of the \$13.4 million escrow for the NCES employment guarantee from the opinion letter included in the proxy materials dated September 10, 1999.”).

87. *See id.* (“Appellees argued that this claim was properly dismissed because it was immaterial as a matter of law.”).

88. *See id.* (“According to the Dow Jones Interactive Quotes and Data Market, this disclosure had no negative effect whatsoever on the price of NovaCare stock on or immediately following November 2, 1999. Accordingly, the district court was correct in dismissing Appellants’ claim . . .” (citation omitted)).

89. *Id.* (quoting *Burlington*, 114 F.3d at 1425) (expressing efficient market hypothesis foundation of stock-price test).

90. 432 F.3d 261 (3d Cir. 2005).

an IPO was material under Rule 10b-5.⁹¹ Once again, the court turned to the efficient market hypothesis and the stock-price test.⁹² In so doing, the court proclaimed, “Our Court, as compared to the other courts of appeals, has one of the ‘clearest commitments’ to the efficient market hypothesis.”⁹³

On the day in which Merck disclosed the information in dispute there was apparently no effect on its stock price.⁹⁴ However, months later, “a *Wall Street Journal* article reading between the lines of this disclosure precipitated a decline in Merck’s stock.”⁹⁵ Thus, the issue became whether the stock market quickly reflects all material information, as the efficient market hypothesis predicts.⁹⁶ If it does, the information was necessarily immaterial, regardless of what happened following the newspaper article.⁹⁷

The court observed that the “[*Basic*] Court declined to resolve ‘how quickly and completely publicly available information is reflected in market price.’”⁹⁸ However, the Third Circuit was not similarly troubled.⁹⁹ The court announced, “We have decided that this absorption occurs ‘in the period immediately following disclosure.’”¹⁰⁰

91. *See id.* at 268 (“The District Court discussed briefly the issue of materiality regarding Union’s § 10(b) claim, but it did not reach the issue because it ultimately found that Union had failed sufficiently to show scienter. Union argues that Merck’s statements were material . . .”).

92. *See id.* at 269 (“[T]he materiality of disclosed information may be measured post hoc by looking to the movement, in the period immediately following disclosure, of the price of the firm’s stock.” (quoting *Oran v. Stafford*, 226 F.3d 275, 282 (3d Cir. 2000)) (internal quotations omitted)).

93. *See id.* (citing Nathaniel Carden, Comment, *Implications of the Private Securities Litigation Reform Act of 1995 for Judicial Presumptions of Market Efficiency*, 65 U. CHI. L. REV. 879, 886 (1998)).

94. *See id.* (“In this case, the disclosure occurred on April 17, and there was no negative effect on Merck’s stock.”).

95. *Id.* at 263 (discussing disclosure and subsequent news article).

96. *See id.* at 269 (discussing speed at which material information is reflected in stock’s price); *In re DVI, Inc. Sec. Litig.*, 639 F.3d 623, 634 (3d Cir. 2011) (“[A]n efficient market is one in which ‘information important to reasonable investors . . . is immediately incorporated into stock prices’” (quoting *In re Burlington Coat Factory Sec. Litig.*, 114 F.3d 1410, 1425 (1997))).

97. *See In re Merck & Co.*, 432 F.3d at 269–70 (holding information is incorporated into stock’s price in period immediately following disclosure, though not instantaneously, and therefore information at issue was immaterial because stock price did not decline within required period).

98. *Id.* at 269 (quoting *Basic Inc. v. Levinson*, 485 U.S. 224, 248 n.28 (1988) (avoiding endorsement of efficient market hypothesis)).

99. *See id.* (“[O]ur Court has resolved how ‘quickly and completely’ public information is absorbed into a firm’s stock price.”).

100. *Id.* (quoting *Oran*, 226 F.3d at 282) (asserting circuit’s position on market efficiency).

The circuit court again applied the stock-price test in its 2010 opinion in *United States v. Schiff*.¹⁰¹ Frederick Schiff and his colleague Richard Lane were charged with orchestrating a securities fraud scheme, and the men were indicted for violating Rule 10b-5, among other things.¹⁰² The government's theory of materiality was based on the stock-price test, and it sought to introduce statistical evidence, known as an event study, to support that theory.¹⁰³ Unlike earlier opinions, the court noted that the stock-price test "is not the only method of proving materiality."¹⁰⁴ Still, the court reaffirmed that the test is dispositive.¹⁰⁵ Furthermore, citing *Oran* and *Burlington*, it stated, "the Third Circuit is committed to the efficient market hypothesis."¹⁰⁶

IV. DEEP FLAWS IN THE EFFICIENT MARKET HYPOTHESIS

The efficient market hypothesis posits that securities markets quickly and accurately reflect all public information.¹⁰⁷ It follows that if a stock's price moved on a certain day, the news released on that day was actually relevant to the value of the stock.¹⁰⁸ In the last three decades of the twen-

101. See *United States v. Schiff*, 602 F.3d 152, 171–72 (3d Cir. 2010) (relying on efficient market principles and stock-price test).

102. See *id.* at 156 (describing allegations against Schiff and Layne).

103. See *id.* at 171–72 (discussing application of stock-price test and expert testimony to event study results).

104. See *id.* at 171 ("Though this is not the only method of proving materiality, it is widely used as evidence if the market is efficient" (footnote omitted)); *id.* at 171 n.26 ("While stock drop evidence is generally accepted, other evidentiary methods could be effective before a jury as well, particularly if additional factors unrelated to the charged fraud muddy the stock drop evidence.").

105. See *id.* (discussing stock-price test).

106. *Id.* (citing *Oran*, 226 F.3d at 282) (internal quotations omitted) (defining an efficient market and discussing court's commitment to the hypothesis)).

107. See Fama, *supra* note 1, at 1575 ("I take the market efficiency hypothesis to be the simplest statement that security prices fully reflect all available information."); see also Donald C. Langevoort, *Taming the Animal Spirits of the Stock Markets: A Behavioral Approach to Securities Regulation*, 97 Nw. U. L. Rev. 135, 140 (2002) ("The [hypothesis] states that stock prices promptly impound all available information. Under most formulations of the [hypothesis], this impoundment reflects market participants' rational expectations, so that stock prices are 'fundamentally efficient.'"). There are three classical versions of the efficient market hypothesis, which differ in the scope of information that markets are seen as efficiently incorporating. See Michael C. Jensen, *Some Anomalous Evidence Regarding Market Efficiency*, 6 J. FIN. ECON. 95, 97–98 (1978) (discussing three broad categories of hypothesis). The Weak Form holds that only "past price history of the market as of time t' is incorporated. See *id.* at 97. The Semi-Strong Form holds that "all information that is publicly available at time t' is incorporated. See *id.* at 98. Finally, the Strong Form holds that all information, even non-public information, is incorporated. See *id.* at 98. "The Semi-strong Form of the Efficient Market Hypothesis, represents the accepted paradigm and is what is generally meant by unqualified references in the literature to the 'Efficient Market Hypothesis.'" *Id.* at 98. The same is true in this Article.

108. See, e.g., Ray Ball & Phillip Brown, *An Empirical Evaluation of Accounting Income Numbers*, 6 J. ACCT. RES. 159, 160–61 (1968) (giving classical explanation of

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tieth century, the hypothesis gained broad acceptance and became a cornerstone of finance, particularly academic finance.¹⁰⁹ Recently, however, faith in the efficient market hypothesis has dramatically eroded.¹¹⁰ While some of the hypothesis's longtime proponents remain loyal, the market efficiency meme has been substantially discredited.¹¹¹

Professor Robert Shiller famously called a leading argument for the efficient market hypothesis, "one of the most remarkable errors in the history of economic thought."¹¹² The hypothesis and its criticisms have sweeping implications that have filled countless pages, and this is not the appropriate venue for a detailed rebuke of the financial theory.¹¹³ Rather, the essential point here is that the hypothesis, which presently defines the Third Circuit's understanding of Rule 10b-5 materiality, has been discredited at least to the point that it deserves little deference from the courts.¹¹⁴ Whatever the merits of the debate among academics and finance professionals, courts should seek firmer ground.

theory). Ball and Brown wrote, "If, as the evidence indicates, security prices do in fact adjust rapidly to new information as it becomes available An observed revision of stock prices associated with the release of the income report would thus provide evidence that the information reflected in income numbers is useful." *Id.*

109. *See* Malkiel, *supra* note 3, at 59 ("A generation ago, the efficient market hypothesis was widely accepted by academic financial economists It was generally believed that securities markets were extremely efficient in reflecting information about individual stocks and about the stock market as a whole.").

110. *See id.* at 60 ("By the start of the twenty-first century, the intellectual dominance of the efficient market hypothesis had become far less universal.").

111. *See, e.g.,* MICHAEL E. LEWITT, *THE DEATH OF CAPITAL* 204 (2010) ("[T]he wholly discredited efficient market theory."). Others still place greater faith in market efficiency. *See, e.g.,* Malkiel, *supra* note 3, at 60 (defending efficient market hypothesis). Notably, Professor Malkiel has been an outspoken proponent of market efficiency for decades. *See generally* BURTON G. MALKIEL, *A RANDOM WALK DOWN WALL STREET* (1973) (advocating for efficient market hypothesis and applying it to portfolio strategy).

112. *See* Shiller, *supra* note 3, at 458–59 ("One form of this argument claims that because real returns are nearly unforecastable, the real price of stocks is close to intrinsic value This argument for the efficient markets hypothesis represents one of the most remarkable errors in the history of economic thought.").

113. *See generally* MALKIEL, *supra* note 111 (advocating passive index investing). The implications of the criticisms of market efficiency are substantial. *See* ANDREI SHLEIFER, *INEFFICIENT MARKETS: AN INTRODUCTION TO BEHAVIORAL FINANCE* 175 (2000) (summarizing some leading challenges to market efficiency); *cf.* CHARLES D. ELLIS, *INVESTMENT POLICY* 7–8 (1994) (counseling investment managers against behavioral biases that encourage shortsighted assessment of risk).

114. *Cf.* SHLEIFER, *supra* note 113, at 23 ("[I]t is difficult to deny that the thrust of this evidence is very different from what researchers found in the 1960s and the 1970s, and is much less favorable to [the efficient market hypothesis]."); *id.* at 175 ("The last 20 years have been very exciting for academic finance Among the many changes in views, the increased skepticism about market efficiency stands out.").

A. *The Assumptions Underlying Market Efficiency*

According to the stock-price test, material information is that which affects the price of a stock.¹¹⁵ The rule assumes that one can reliably determine the cause of a given change in a stock's price.¹¹⁶ It is the efficient market hypothesis that makes that jump in logic—or perhaps leap of faith—possible.¹¹⁷ Yet the hypothesis rests on three rather dubious assumptions.¹¹⁸

First, the hypothesis assumes that a large number of rational, that is, profit-maximizing, participants value securities independently.¹¹⁹ Second,

115. See, e.g., *In re NAHC, Inc. Sec. Litig.*, 306 F.3d 1314 (3d Cir. 2002) (quoting *In re Burlington Coat Factory Sec. Litig.*, 114 F.3d 1410, 1425 (3d Cir. 1997)) (explaining stock-price test and its dependence on efficient markets).

116. See, e.g., *Oran v. Stafford*, 226 F.3d 275, 283 (3d Cir. 2000) (“[T]he July 8 disclosure had no appreciable negative effect on the company’s stock price; in fact, AHP’s share price rose by \$3.00 during the four days after the Mayo disclosure. Under *Burlington’s* market test, this price stability is dispositive of the question of materiality.”).

117. See, e.g., *In re Merck & Co. Sec. Litig.*, 432 F.3d 261, 274 (3d Cir. 2005) (“We reached this conclusion in two steps. First, reasonable investors are the market. Second, information important to the market will be reflected in the stock’s price. Thus, information important to reasonable investors . . . is immediately incorporated into stock prices.” (internal quotations omitted)).

118. See FRANK K. REILLY & KEITH C. BROWN, *INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT* 150–51 (10th ed. 2011) (explaining assumptions underlying efficient market hypothesis). The recent behavioral finance scholarship that casts doubt on these assumptions also challenges the *TSC Industries* test by suggesting that the hypothetical reasonable, rational investor has very little in common with actual investors who may be characteristically irrational. See generally DAN ARIELY, *PREDICTABLY IRRATIONAL: THE HIDDEN FORCES THAT SHAPE OUR DECISIONS* (2008) (presenting evidence that investors are irrational in many ways). Moreover, even the detractors of behavioral finance will concede that a great deal of the trading that goes on in modern equity markets is not based on any assessment at all of a stock’s value. Cf. Ben Protess, *Big Board Settles Case Over Early Data Access*, N.Y. TIMES, Sept. 14, 2012, at B1; Charles Duhigg, *Stock Traders Find Speed Pays, in Milliseconds*, N.Y. TIMES, July 23, 2009, at A1.; Barry Ritholtz, *Nanex: Disturbing Liquidity*, THE BIG PICTURE (Sept. 17, 2012, 11:30 AM), <http://www.ritholtz.com/blog/2012/09/nanex-disturbing-liquidity/>. Modern financial instruments may also be compounding the inefficient tendencies of the markets. See, e.g., *Prepared Testimony by Harold Bradley and Robert E. Litan Before the Subcomm. on Securities, Insurance, and Investments of the S. Comm. on Banking, Housing, and Urban Affairs*, 112th Cong. 3 (2011), available at <http://www.kauffman.org/uploadedFiles/ETFs-and-the-Present-Danger-to-Capital-Formation.pdf> (“We believe that [ETFs] may now be undermining the fundamental role of equities markets in pricing securities to ensure that capital is efficiently allocated to growing businesses. . . . [I]ndividual common stocks increasingly behave as if they are derivatives of frequently traded and interlinked ETF baskets . . .”).

119. See REILLY & BROWN, *supra* note 118, at 150 (“An initial and important premise of an efficient market requires that a large number of profit-maximizing participants analyze and value securities, each independently of the others.”); SHLEIFER, *supra* note 113, at 2–3 (exploring theoretical foundations of efficient market hypothesis).

it assumes that new information comes to the market randomly.¹²⁰ Third, “the buy and sell decisions of all those profit-maximizing investors cause security prices to adjust rapidly to reflect the effect of new information.”¹²¹

Rationality in this context means that investors value securities at the net present value of the securities’ appropriately discounted future cash flows.¹²² Even if some investors act irrationally, they do so in an uncorrelated way, and therefore have little net effect on price.¹²³ Furthermore, any mispricing that does occur is quickly arbitrated away.¹²⁴ Therefore, “security prices should reflect all information that is publically available at any point in time.”¹²⁵

B. *An Evolving Understanding of Markets*

The efficient market hypothesis developed out of finance scholarship in the 1950s and 1960s, which suggested that the market prices of securities follow a “random walk.”¹²⁶ In 1970, University of Chicago Professor Eugene Fama published the hypothesis’s seminal work, and other scholars

120. See REILLY & BROWN, *supra* note 118, at 150 (“A second assumption is that new information regarding securities comes to the market in a random fashion, and the timing of one announcement is generally independent of others.”); SHLEIFER, *supra* note 113, at 5–6 (footnote omitted) (discussing market reaction to information).

121. REILLY & BROWN, *supra* note 118, at 150 (emphasis omitted) (discussing rapidity with which efficient market should reflect public information); SHLEIFER, *supra* note 113, at 2 (discussing market reaction to information).

122. See SHLEIFER, *supra* note 113, at 2 (“[I]nvestors are assumed to be rational [T]hey value each security for its fundamental value: the net present value of its future cash flows, discounted using their risk characteristics.”).

123. See *id.* at 3 (“In such a market, there will be substantial trading volume as the irrational investors exchange shares with each other, but the prices are nonetheless close to fundamental values.”).

124. See *id.* (“[I]f investors irrationally bid up the price of a security,] smart investors, or arbitrageurs, would sell or even sell short this expensive security and simultaneously purchase other, ‘essentially similar,’ securities to hedge their risks.”).

125. See REILLY & BROWN, *supra* note 118, at 151 (“[T]he security prices that prevail at any time should be an unbiased reflection of all currently available information, including the risk involved in owning the security.”).

126. See Jensen, *supra* note 107, at 96 (“The Efficient Market Hypothesis is an important concept, and it has become increasingly widely accepted since interest in it was reborn in the late 1950’s and early 1960’s under the rubric of the ‘theory of random walks’ in the finance literature and ‘rational expectations theory’ in the mainstream economics literature.”); Paul A. Samuelson, *Proof that Properly Anticipated Prices Fluctuate Randomly*, 6 INDUS. MGMT. REV. 41, 44–46 (1965) (observing randomness of futures markets). “This means that there is no way of making an expected profit by extrapolating past changes in the futures price The market quotation . . . already contains in itself all that can be known about the future and in that sense has discounted future contingencies as much as is humanly possible.” *Id.* at 44.

soon built on the theory.¹²⁷ The hypothesis called into question the earlier work of scholars like John Maynard Keynes who had emphasized the irrationality of economic actors.¹²⁸

As early as 1978, a leading finance scholar wrote, “there is no other proposition in economics which has more solid empirical evidence supporting it than the Efficient Market Hypothesis.”¹²⁹ That wide support likely helps to explain why the *Burlington* court, not to mention the Supreme Court in *Basic*, expressed such faith in the hypothesis.¹³⁰ Nevertheless, subsequent study has shown the prescience of Justice White’s warning that, “while the economists’ theories which underpin the fraud-on-the-market presumption may have the appeal of mathematical exactitude and scientific certainty, they are—in the end—nothing more than theories which may or may not prove accurate upon further consideration.”¹³¹

Over the last forty years, scholars have extensively tested the hypothesis’s predictions, as well as its assumptions, and have returned, at best, mixed results.¹³² Perhaps none have said it better than the incomparable Benjamin Graham: “Sometimes [Mr. Market’s] idea of value appears plausible and justified Often, on the other hand, Mr. Market lets his enthusiasm or his fears run away with him, and the value he proposes seems to you a little short of silly.”¹³³

C. *The Case (In Brief) Against the Hypothesis*

To paraphrase an eminent market strategist, “the prima facie case” against the efficient market hypothesis is the frequent occurrence of asset price bubbles.¹³⁴ If the efficient market hypothesis holds true, these events should occur infrequently, if at all, yet empirical research and pain-

127. See generally Fama, *supra* note 1 (laying foundation of modern efficient market theory). R

128. See Brown, *supra* note 1, at 80 (describing early efficient market hypothesis research). R

129. See Jensen, *supra* note 107, at 97 (noting in 1978 that scholars “seem to be entering a stage where widely scattered and as yet incohesive evidence is arising which seems to be inconsistent with the [efficient market hypothesis]”). R

130. For a further discussion of judicial reliance on the efficient market hypothesis, see *supra* notes 78–106 and accompanying text.

131. See *Basic Inc. v. Levinson*, 485 U.S. 224, 254 (1988) (White, J., dissenting in part) (urging cautious approach to applying efficient market hypothesis).

132. See REILLY & BROWN, *supra* note 118, at 152, 155–65 (discussing mixed results of empirical analysis of Semi-strong Form of efficient market hypothesis). The Semi-strong Form of the efficient market hypothesis is the one typically applied to materiality analysis. See, e.g., *In re DVI, Inc. Sec. Litig.*, 639 F.3d 623, 631 (3d Cir. 2011) (explaining Semi-strong Form efficient market hypothesis).

133. BENJAMIN GRAHAM, *THE INTELLIGENT INVESTOR* 205 (4th ed. 2003) (giving his famous explanation of basic functioning of markets).

134. James Montier, *Six Impossible Things Before Breakfast, or, How EMH Has Damaged Our Industry*, MIND MATTERS 12 (2009), reprinted in JAMES MONTIER, *VALUE INVESTING: TOOLS AND TECHNIQUES FOR INTELLIGENT INVESTMENT* 14 (2009) (describing empirical studies of asset price bubbles).

ful experience have shown that they are actually quite common.¹³⁵ Similarly, the regularity with which major securities markets appear to evince systemic, correlated, irrationality makes it difficult for many finance professionals to endorse the efficient market hypothesis with a straight face.¹³⁶

More pointedly, the scholarly evidence is unfavorable to the hypothesis on two grounds.¹³⁷ First, many, though by no means all, of the financial theory-based studies to evaluate the hypothesis have revealed market responses to information that are contrary to the predictions of the hypothesis.¹³⁸ Second, advances in neuroscience, and related fields, have fatally undermined the assumptions about human behavior upon which the hypothesis rests.¹³⁹

1. *The Validity of the Hypothesis's Predictions*

If the hypothesis were true, all public information would be fully accounted for in a stock's price.¹⁴⁰ However, studies have shown that several variables, including dividend yield, price-earnings ratio, and firm size can predict excess future returns.¹⁴¹ Scholars have also shown convincingly

135. *See id.* ("My friends at GMO define a bubble as a (real) price movement that is at least two standard deviations from trend. Now a two standard deviation event should occur roughly every 44 years. Yet since 1925, GMO have [sic] found a staggering 30 plus bubbles . . . more than one every three years!").

136. *See, e.g.,* Barry Ritholtz, *How Often Should We Expect a Financial Crisis?*, THE BIG PICTURE (Feb. 12, 2010, 10:45 AM), <http://www.ritholtz.com/blog/2010/02/how-often-should-we-expect-a-financial-crisis/> (listing sixteen financial meltdowns since the 1970s); *cf.* Graham Bowley, *Lone Sale of \$4.1 Billion in Contracts Led to "Flash Crash" in May*, N.Y. TIMES, Oct. 2, 2010, at B1 (discussing "Flash Crash" in which Dow Jones Industrial Average declined 9.2% in one day, only to regain 6% before closing, and stocks of prominent companies traded "as low as a penny or as high as \$100,000").

137. *See* Langevoort, *supra* note 107, at 139 ("The research agenda for critics of market efficiency proceeds in a series of steps. . . . [S]tudies that demonstrate that the markets are not behaving in accordance with the predictions . . . [and second,] the creation of alternative models.").

138. *See* REILLY & BROWN, *supra* note 118, at 165 ("Clearly, the evidence from tests of the semistrong EMH is mixed. The hypothesis receives almost unanimous support from the numerous event studies In sharp contrast, the numerous studies on predicting rates of return over time or for a cross section of stocks presented evidence counter to semistrong efficiency.").

139. *See id.* at 170 (describing research into behavioral biases); SHLEIFER, *supra* note 113, at 51–52 ("Risk created by the unpredictability of investor sentiment significantly reduces the attractiveness of arbitrage. . . . The theoretical presumption for market efficiency based on arbitrage simply does not exist once the realities of real-world arbitrage begin to be modeled seriously.").

140. *See, e.g.,* Fama, *supra* note 1, at 1575 ("I take the market efficiency hypothesis to be the simplest statement that securities prices fully reflect all available information.").

141. *See* REILLY & BROWN, *supra* note 118, at 155 (discussing results of studies that use time-series analysis or cross-section distribution of returns to test ability of public information other than market price to predict future returns); ROBERT SHILLER, *IRRATIONAL EXUBERANCE* 179 (2000) (discussing anecdotal evidence of

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that unexpected earnings information is not immediately reflected in a security's price in the way that the hypothesis predicts.¹⁴² There is "evidence that moods triggered by good or bad weather can affect stock prices on a given day."¹⁴³ Similarly, several studies have observed seasonal patterns in stock prices, which the hypothesis says should be arbitrated away.¹⁴⁴

Some analyses, mostly in the form of event studies, have produced more favorable results.¹⁴⁵ An event study is a statistical method that was pioneered by Fama and others in the late 1960s.¹⁴⁶ The studies attempt to separate the effect on a stock price of a given event from the effects of all other factors.¹⁴⁷ The methodology has been used to test the efficient market hypothesis by attempting to measure the speed with which information is incorporated into stock prices.¹⁴⁸ Proponents of event studies also take the methodology further; they hold market efficiency as a given and then attempt to divine the impact of a particular event on a stock's price.¹⁴⁹

market inefficiency then stating, "[I]n fact there is no shortage of systematic evidence that firms that are 'overpriced' by conventional measures have indeed tended to do poorly afterward.").

142. *See id.* at 157 ("In summary, these results indicate that the market has not adjusted stock prices to reflect the release of quarterly earnings surprises as fast as expected by the semistrong EMH These results are evidence against the EMH.").

143. *See* Langevoort, *supra* note 107, at 144 (discussing psychology of stock price changes) (citing Edward M. Saunders, Jr., *Stock Prices and Wall Street Weather*, 83 AM. ECON. REV. 1337 (1993)).

144. *See* REILLY & BROWN, *supra* note 118, at 158 (discussing January Anomaly and other calendar effects).

145. *See id.* at 161–65 (discussing event studies that have been generally favorable to efficient market hypothesis).

146. *See generally* Eugene F. Fama et al., *The Adjustment of Stock Prices to New Information*, 10 INT'L ECON. REV. 1 (1969) (using event study methodology to study price effect of stock splits); *see also* John J. Binder, *The Event Study Methodology Since 1969*, 11 REV. QUANTITATIVE FIN. & ACCT. 111, 111 (1998) ("[T]he paper by Fama, Fisher, Jensen and Roll [citation omitted], which introduced the event study methodology, stands out in the academic profession." (emphasis added)).

147. *See, e.g.,* Mitchell & Netter, *supra* note 75, at 556–57 (describing event study methodology).

148. *See* Binder, *supra* note 146 at 111 ("[E]vent studies have been used for two major reasons: 1) to test the null hypothesis that the market efficiently incorporates information").

149. *See id.* ("[E]vent studies have been used for two major reasons . . . 2) under the maintained hypothesis of market efficiency, at least with respect to publicly available information, to examine the impact of some event on the wealth of the firm's security holders."). The latter application of event studies is another direct means by which the efficient market hypothesis is injected into securities fraud cases. *See generally* Michael J. Kaufman & John M. Wunderlich, *Regressing: The Troubling Dispositive Role of Event Studies in Securities Fraud Litigation*, 15 STAN. J.L. BUS. & FIN. 183, 191–93 (2009) (exploring application of event studies to 10b-5 litigation). In the 10b-5 materiality context, an expert employing the event study methodology is examining the changes in the price of a stock around the time of an allegedly fraudulent statement. *See id.* (explaining event study methodology in detail). In order to do so, the tester models the so-called normal relationship be-

Event studies lend the strongest support for the efficient market hypothesis.¹⁵⁰ Some of the studies have identified market inefficiencies surrounding the listing of stocks on an exchange.¹⁵¹ However, they have generally been supportive of market efficiency.¹⁵² For example, several of the studies have concluded that markets are efficient as to information about stock splits and IPO valuation.¹⁵³

Nevertheless, financial theory-based studies of market efficiency are generally plagued by an innate “joint hypothesis problem”; which is to say that market efficiency is untestable.¹⁵⁴ As Fama himself wrote, “we can only test whether information is properly reflected in prices in the context of a pricing model that defines the meaning of ‘properly.’ . . . [T]he way [anomalous results] should be split between market inefficiency or a bad model of market equilibrium is ambiguous.”¹⁵⁵ Fama argues persuasively that such flaws should not dissuade economists from undertaking empiri-

tween the individual stock and the market, projects that forward through the time of the event, and compares it to the actual performance of the stock. *See id.* at 191–94 (describing in detail event study methodology). Such studies assume that individual stocks and the market as a whole behave as the efficient market hypothesis predicts. *See id.* at 190 (“Event study methodology is founded on the efficient market hypothesis, [I]n terms of an event study, a change in stock price in light of a public announcement is owing to the arrival of new information in the market provided by that announcement.”) (footnote omitted); *id.* at 196 (“Materially positive news causes a stock’s price to rise, but if the information is immaterial, then investors’ decisions to buy are unaffected. . . . The expert can then opine as to the probability that this movement was caused by the release of the material information”). Thus, the validity of the event studies used in 10b-5 cases turns on market efficiency, for which the best evidence is other event studies. That is an important point that is seemingly glossed over by many event study authors. *See* Fama, *supra* note 1, at 1601–02 (explaining Professor Fama’s comment that confidence in market efficiency among event study practitioners was such that “this work now devotes little space to market efficiency. The fact that quick adjustment is consistent with efficiency is noted, and then the studies move on to other issues.”).

150. *See* REILLY & BROWN, *supra* note 118, at 165 (“Clearly, the evidence from tests of semistrong EMH is mixed. [But t]he hypothesis receives almost unanimous support from the numerous event studies”); Brown, *supra* note 1, at 88 (“It would seem that event studies provide the strongest possible evidence in favour of the EMH.”).

151. *See* REILLY & BROWN, *supra* note 118, at 163 (“[B]ecause listing studies provide evidence of short-run profit opportunities for investors using public information, these studies would not support the semistrong-form EMH.”).

152. *See* Fama, *supra* note 1, at 1601 (“The typical result in event studies on daily data is that, on average, stock prices seem to adjust within a day to event announcements.”).

153. *See* REILLY & BROWN, *supra* note 118, at 162–63 (“In summary, most studies found no short-run or long-run positive impact on security returns because of a stock split, although the results are not unanimous. . . . [Additionally,] rapid adjustment of the initial underpricing [following IPOs] would support the semistrong EMH.”).

154. *See* Fama, *supra* note 1, at 1575 (“The joint-hypothesis problem is more serious. Thus, market efficiency per se is not testable.”).

155. *Id.* at 1576.

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cal study of market efficiency.¹⁵⁶ True enough; but the same is not well-said of courts.

In sum, several studies cast doubt on the hypothesis's predictions.¹⁵⁷ Others, namely many event studies, seem to confirm its predictions.¹⁵⁸ Meanwhile, financial theory-based studies of market efficiency are hamstrung by the "joint hypothesis problem."¹⁵⁹ Such a status quo might be exciting debate fodder for academics and professional investors, but it casts too much doubt upon the hypothesis for it to serve as the foundation of a legal doctrine.¹⁶⁰

2. *The Validity of the Hypothesis's Assumptions*

While traditional finance scholars have found that the hypothesis's predictions are often not borne out by empirical study, the comparatively new discipline of behavioral finance has challenged the hypothesis's assumptions about human behavior.¹⁶¹ In recent years, advances in psychology, social psychology, and neuroscience have yielded a more nuanced understanding of investor, and market, behavior.¹⁶² That work has demonstrated convincingly that investors are often not rational, and arbitrageurs do not offset all distortions.¹⁶³

Keynes and others observed long ago that human irrationality is a driving force behind market behavior.¹⁶⁴ Irrationality is in many ways per-

156. *See id.* ("Does the fact that market efficiency must be tested jointly with an equilibrium-pricing model make empirical research on efficiency uninteresting? . . . My answer is an unequivocal no.")

157. *See* SHILLER, *supra* note 141, at 183 ("In sum, stock prices clearly have a life of their own; they are not simply responding to earnings or dividends. Nor does it appear that they are responding to information about future earnings or dividends. In seeking explanations of stock price movements, we must look elsewhere."). For a discussion of the empirical evidence regarding the efficient market hypothesis's assumptions, see *supra* notes 140–56 and accompanying text.

158. For further discussion of event studies in particular, see *supra* notes 150–53 and accompanying text.

159. For a brief discussion of the "joint-hypothesis problem," see *supra* notes 154–56 and accompanying text.

160. *Cf.* REILLY & BROWN, *supra* note 118, at 176 (summarizing mixed results of tests of efficient market hypothesis and advances in behavioral finance).

161. *See id.* at 169 ("Behavioral finance considers how various psychological traits affect how individuals or groups act as investors, analysts, and portfolio managers.")

162. *See id.* (describing behavioral finance as the synthesis of psychology, social psychology, and neurofinance).

163. *See id.* at 170 (introducing some chief findings of behavioral finance).

164. *See* JOHN MAYNARD KEYNES, *THE GENERAL THEORY OF EMPLOYMENT, INTEREST & MONEY* 161–62 (Harcourt, Brace & World 1964) (1936). In one of the most famous passages in all of economic literature, Keynes wrote:

Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, *can only be taken as a result of animal spirits* . . . and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities. Enterprise only pretends to itself to be mainly actuated by the statements

vasive and systemic, and it is characteristic of even the most sophisticated investors.¹⁶⁵ Recent scholarship has documented many identifiable irrational behaviors in the specific context of investing.¹⁶⁶

For example, humans perceive the anticipation of gain more intensely than the gain itself, which may help to explain the adage, “Buy on the rumor, sell on the news.”¹⁶⁷ Furthermore, investors perceive losses more intensely than gains, which may contribute to incidences of panic selling.¹⁶⁸ They also tend to ignore evidence that is contrary to their beliefs, and seek out confirmatory evidence.¹⁶⁹ Studies have further shown that investors display irrationality in correlated ways, contributing to volatility.¹⁷⁰

in its own prospectus, however candid and sincere. Only a little more than an expedition to the South Pole, is it based on an exact calculation of benefits to come.

Id. (emphasis added) (describing role of human irrationality in driving an economy). *Cf.* JASON ZWEIG, *YOUR MONEY YOUR BRAIN* 40 (2007) (“If we were placed between the bottle and the ham with an equal appetite for drinking and for eating, there would doubtless be no solution but to die of thirst and hunger.” (quoting Michel de Montaigne)).

165. *See* ZWEIG, *supra* note 164, at 4 (recounting Harry M. Markowitz’s admission to ignoring his own research and allocating his investments based on emotion); *cf.* ARIELY, *supra* note 118, at 232 (“[T]hese examples show that we are not noble in reason, not infinite in faculty, and rather weak in apprehension.”). Toward the end of his insightful and accessible book, Professor Ariely states concisely the difference between the model of the rational economic person and what behavioral science has learned about actual human behavior:

Standard economics assumes that we are rational—that we know all the pertinent information about our decisions, that we can calculate the value of the different options we face, and that we are cognitively unhindered in weighing the ramifications of each potential choice.

. . . .

But, as the results presented in this book (and others) show, we are all far less rational in our decision making than standard economic theory assumes. Our irrational behaviors are neither random nor senseless—they are systematic and predictable. We all make the same types of mistakes over and over, because of the basic wiring of our brains.

Id. at 239.

166. *See generally*, ARIELY, *supra* note 118 (discussing common patterns of irrationality); ZWEIG, *supra* note 164 (exploring application of common behavioral heuristics to investing).

167. *See* ZWEIG, *supra* note 164, at 39–42 (exploring importance of anticipation and arousal to investment decisions).

168. *See* SHLEIFER, *supra* note 113, at 11 (discussing prospect theory).

169. *See* REILLY & BROWN, *supra* note 118, at 170 (explaining confirmation bias).

170. *See, e.g.*, John P. Hussman, *Bubble, Crash, Bubble, Crash, Bubble . . .*, HUSSMAN FUNDS WEEKLY MARKET COMMENT (Nov. 8, 2010), <http://www.hussmanfunds.com/wmc/wmc101108.htm> (“In recent years, the average correlations among sectors and various asset classes have moved from about 30–40%, which is normal, to nearly 80%”); *see also* Graham Bowley, *In an Uncertain Market, Investors Rush In, and Out, Together*, N.Y. TIMES, Dec. 31, 2011, at B1 (discussing security price correlations).

Arbitrage is similarly limited by behavioral, as well as structural, constraints.¹⁷¹ Very often, potential arbitrageurs are separated from capital by an agency relationship; they are managing someone else's money.¹⁷² The career risk associated with taking out-of-favor positions means that "arbitrageurs can become most constrained precisely when they have the best opportunities . . ."¹⁷³ Moreover, theories of arbitrage generally assume that short-sellers will enter the market if a security becomes overpriced.¹⁷⁴ However, scholars have shown that when arbitrage opportunities are the greatest, potential short sellers are often constrained in their ability to borrow the securities they intend to sell.¹⁷⁵

D. *Overvaluation of a Financial Theory*

Taken together, this evidence calls into question both the underlying assumptions of the efficient market hypothesis, and its predictions.¹⁷⁶ While the dominant scholarship at the time of *Basic* may have supported the Court's acceptance of efficient market principles, that is no longer the case.¹⁷⁷ Keynes famously wrote that, "Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist."¹⁷⁸ However, once courts recognize the disparity between the value that they have ascribed to the efficient market hypothesis, and the hypothesis's intrinsic value, a correction seems inevitable.

171. See SHLEIFER, *supra* note 113, at 90 (noting behavioral and structural constraints on arbitrage); cf. Montier, *supra* note 134, at 9 ("This, of course, is akin to the age old joke about the economist and his friend walking along the street. The friend points out a \$100 bill lying on the pavement. The economist says, 'It isn't really there because if it were someone would have already picked it up.'").

172. See SHLEIFER, *supra* note 113, at 90–96 (exploring effect of agency relationship on arbitrage).

173. See *id.* at 90 (discussing limitations on arbitrage by professionals investing client money).

174. See *id.* at 3 ("Noting this overpricing, smart investors, or arbitrageurs, would sell or even sell short this expensive security . . .").

175. See *id.* at 3–4 (explaining behavioral and structural limitations on short selling and their relationship to arbitrage).

176. For a discussion of the hypothesis's predictions, see *supra* notes 140–60 and accompanying text. For a discussion of the hypothesis's assumptions, see *supra* notes 161–75.

177. See, e.g., LEWITT, *supra* note 111, at 204 (describing "the wholly discredited efficient market theory"); Joe Nocera, *supra* note 4 ("[Jeremy Grantham of GMO] continued: 'The incredibly inaccurate efficient market theory was believed in totality by many of our financial leaders, and . . . the absolutely worst part of this belief set was that it led to a chronic underestimation of the dangers of asset bubbles breaking.'").

178. See KEYNES, *supra* note 164, at 383 (criticizing undue faith in economic theory).

V. CONCLUSIONS FOR THIRD CIRCUIT ADVOCACY

The Third Circuit's materiality doctrine has outlived its legitimacy.¹⁷⁹ *Matrixx Initiatives* made eminently clear that bright-line 10b-5 materiality rules are inapposite.¹⁸⁰ At the same time, the efficient market hypothesis has passed from vogue, as advances in the understanding of securities markets (and the human brain) have cast serious doubt on many of its assumptions and predictions.¹⁸¹ That gives Third Circuit practitioners ample means with which to attack the propriety of the stock-price test itself, and distinguish the court's precedents on the issue.¹⁸²

A practitioner advocating against the stock-price test on the grounds that it is a bright-line rule should emphasize *Matrixx Initiatives*.¹⁸³ The *Matrixx Initiatives* Court drew its language directly from *Basic*.¹⁸⁴ Nevertheless, that the Third Circuit was not alone in relying on a bright-line rule, and that the *Matrixx Initiatives* Court had to rule on the issue decades later, suggest that *Basic* left some ambiguity.¹⁸⁵ Whatever the case, the *Matrixx Initiatives* Court made clear that bright-line materiality rules can no longer stand.¹⁸⁶

Furthermore, regardless of a court's receptivity to criticisms of the efficient market hypothesis, practitioners should consider emphasizing that the circuit's enthusiastic embrace of the theory is incongruous with the approach of the finance community.¹⁸⁷ It seems highly imprudent for the law to place greater faith in financial theories than finance scholars do.¹⁸⁸ Practitioners might do well to argue that finance has become more

179. For a further discussion of why the materiality doctrine is flawed, see *supra* notes 169–71 and accompanying text.

180. For a discussion of Supreme Court precedent on the impropriety of bright-line materiality rules, see *supra* notes 37–55 and accompanying text.

181. For a discussion of a case against the efficient market hypothesis, see *supra* notes 134–75 and accompanying text.

182. For a discussion of the inefficiency with respect to unexpected earnings information, see *supra* note 142 and accompanying text.

183. For a discussion of the Supreme Court's repudiation of bright-line tests, see *supra* notes 37–55 and accompanying text.

184. See *Matrixx Initiatives, Inc. v. Siracusano*, 131 S. Ct. 1309, 1318 (2011) (rejecting bright-line tests for 10b-5 materiality) (quoting *Basic Inc. v. Levinson*, 485 U.S. 224, 236 (1988)).

185. For a discussion of different circuits' approaches to materiality, see *supra* notes 48–50 and accompanying text.

186. See *Matrixx Initiatives*, 131 S. Ct. at 1318 (“[A]ny approach that designates a single fact or occurrence as always determinative of an inherently fact-specific finding such as materiality, must necessarily be overinclusive or underinclusive.” (quoting *Basic*, 485 U.S. at 236)).

187. For a discussion of the finance community's eroding faith in the efficient market hypothesis, see *supra* notes 126–33 and accompanying text.

188. Compare *United States v. Schiff*, 602 F.3d 152, 171–72 (3d Cir. 2010) (noting precedent for proposition that “the Third Circuit is committed to the efficient market hypothesis.”), and *In re Merck & Co. Sec. Litig.*, 432 F.3d 261, 269 (3d Cir. 2005) (“Our Court, as compared to the other courts of appeals, has one of the clearest commitments to the efficient market hypothesis.” (internal quotations

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sophisticated than the unfettered belief in market efficiency, and so should the law of the Third Circuit.

omitted)), *with* Malkiel, *supra* note 3, at 4 (“By the start of the twenty-first century, the intellectual dominance of the efficient market hypothesis had become far less universal.”), SHLEIFER, *supra* note 113, at 23 (“[I]t is difficult to deny that the thrust of this evidence is very different from what researchers found in the 1960s and the 1970s, and is much less favorable to [the efficient market hypothesis].”), *and id.* at 175 (“The last 20 years have been very exciting for academic finance Among the many changes of views, the increased skepticism about market efficiency stands out.”).

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