

**UNITED STATES DISTRICT COURT
DISTRICT OF CONNECTICUT**

IN RE TEVA SECURITIES LITIGATION

No. 3:17-cv-558 (SRU)

THIS DOCUMENT RELATES TO:

All Class Actions

RULING AND ORDER

This consolidated action consists of 25 separate cases.¹ In those cases, numerous plaintiffs have sued Teva Pharmaceutical Industries, Ltd. (“Teva”), various Teva subsidiaries, and several current and former employees and officers of Teva. The plaintiffs allege that the defendants violated federal and state securities laws because they misrepresented the reasons for Teva’s financial success. More specifically, the plaintiffs allege that the defendants publicly attributed Teva’s success to good business decisions when, in fact, Teva was thriving because it was artificially and collusively inflating the prices of certain generic drugs that it manufactured.

Four of the cases in this consolidated action are putative class actions.² On June 19, 2020, the lead and named plaintiffs³ (the “Plaintiffs”) made a motion for class certification. *See* Mot. for Class Cert., Doc. No. 419. The defendants in the lead putative class action are Teva, Teva Pharmaceuticals Finance Netherlands III B.V. (“Teva Finance”), and several current and

¹ *See* Consolidation Ruling, Doc. No. 341; Consolidation Order, Doc. No. 352. The consolidation ruling is also available at: *Ontario Teachers’ Pension Plan Bd. v. Teva Pharm. Indus., Ltd.*, 2020 WL 1181366 (D. Conn. Mar. 10, 2020).

² Those are: (1) *Ontario Teachers’ Pension Plan Bd., et al. v. Teva Pharm. Indus., Ltd., et al.*, No. 3:17-cv-558; (2) *Huellemeier v. Teva Pharm. Indus., Ltd., et al.*, No. 3:17-cv-1938; (3) *Grodko v. Teva Pharm. Indus., Ltd., et al.*, No. 3:18-cv-800; and (4) *Emps.’ Ret. Sys. of the City of St. Petersburg, Fla. v. Teva Pharm. Indus., Ltd., et al.*, No. 3:19-cv-1768.

³ On July 11, 2017, I appointed Ontario Teachers’ Pension Plan Board as lead plaintiff and approved of its choice of Bleichmar Fonti & Auld LLP as lead counsel. *See* Order, Doc. No. 124. On August 31, 2017, I appointed Anchorage Police & Fire Ret. Sys. as named plaintiff. *See* Am. Order, Doc. No. 137.

former officers of Teva (collectively, the “Defendants”).⁴ The Plaintiffs ask me to certify the following class pursuant to Fed. R. Civ. P. 23(b)(3):

- (1) As to claims under the Securities Exchange Act of 1934, all persons and entities who, in domestic transactions, purchased or otherwise acquired the following securities during the period from February 6, 2014 through May 10, 2019, inclusive (the “Class Period”), and were damaged thereby:
 - a. Teva American Depositary Shares (“ADS”);
 - b. Teva 7.00% mandatory convertible preferred shares issued on or about December 3, 2015 and January 6, 2016 (“Preferred Shares”);
 - c. The following Teva Finance U.S.-dollar-denominated senior notes issued on or about July 21, 2016:
 - i. 1.400% Senior Notes due July 20, 2018 (“2018 Notes”);
 - ii. 1.700% Senior Notes due July 19, 2019 (“2019 Notes”);
 - iii. 2.200% Senior Notes due July 21, 2021 (“2021 Notes”);
 - iv. 2.800% Senior Notes due July 21, 2023 (“2023 Notes”);
 - v. 3.150% Senior Notes due October 1, 2026 (“2026 Notes”); and
 - vi. 4.100% Senior Notes due October 1, 2046 (“2046 Notes”) (collectively, the “Notes”); and
- (2) As to claims under the Securities Act of 1933, all persons and entities who, in domestic transactions, purchased or otherwise acquired ADS, Preferred Shares, and Notes pursuant or traceable to the offerings of ADS and Preferred Shares completed on or about December 3, 2015 and January 6, 2016, or the offering of the Notes completed on or about July 21, 2016; and as to the alleged additional state-law claims, all persons and entities who purchased or otherwise acquired ADS pursuant to Teva’s Employee Stock Purchase Plan for U.S. Employees (“ESPP”) during the Class Period, and were damaged thereby.⁵

⁴ The Defendants are: (1) Teva, (2) Erez Vigodman, (3) Eyal Desheh, (4) Sigurdur Olafsson, (5) Deborah Griffin, (6) Kåre Schultz, (7) Michael McClellan, (8) Yitzhak Peterburg, and (9) Teva Finance. *See* Second Am. Consol. Class Action Compl., Doc. No. 310, at ¶¶ 25–34; ¶¶ 410–16.

⁵ Excluded from the Class would be: (1) Defendants and any affiliates or subsidiaries thereof; (2) present and former officers and directors of Teva, Teva USA, and Teva Finance, and their immediate family members (as defined in Item 404 of SEC Regulation S-K, 17 C.F.R. § 229.404, Instructions (1)(a)(iii) & (1)(b)(ii)); (3) Defendants’ liability insurance carriers, and any affiliates or subsidiaries thereof; (4) any entity in which any Defendant has or has had a controlling interest; (5) Teva’s employee retirement and benefit plan(s) (not including

The Plaintiffs also ask me to appoint them Class Representatives of the Class pursuant to Rules 23(a) and 23(b)(3) and to appoint Bleichmar Fonti & Auld LLP as Class Counsel, with Carmody Torrance Sandak & Hennessey LLP as Class Liaison Counsel pursuant to Rule 23(g). *See* Mot. for Class Cert., Doc. No. 419, at 1. The Plaintiffs’ motion for class certification is supported by opinions and reports by a purported expert on market efficiency. In opposition, the Defendants submit reports from three experts of their own. The Defendants ask me to exclude the Plaintiffs’ expert’s opinions and to strike his expert reports. *See Daubert* Mot., Doc. No. 678. On January 29, I held oral argument on the instant motions.

For the following reasons, I **grant** the Plaintiffs’ motion for class certification, doc. no. 419, and **deny** the Defendants’ *Daubert* motion, doc. no. 678.

I. Background⁶

The Plaintiffs claim that, beginning in 2013, Teva adopted a concerted and secret strategy of raising prices on certain drugs in its generic drug portfolio. Between July 3, 2013 and April 6, 2016, Teva raised prices 76 times. *See* Second Am. Consol. Class Action Compl. (the “SAC”), Doc. No. 310, at ¶¶ 2, 40, 120, 128, App. A. The Plaintiffs allege that Teva undertook many of those price increases in tandem with competitors in the generic drug market. *See id.* at ¶¶ 46, 174–81, App. A, App. B. As a result of those price increases, Teva’s business boomed, as reflected in both profits and stock price. *See id.* at Figure 1 (inflated profit), Figure 2 (stock price). Indeed, by July 27, 2015, Teva’s stock price had soared to an all-time high of \$72 per share. *See id.* at ¶ 277. In August 2016, Teva was able to leverage its stock price to help finance a \$40 billion purchase of Actavis, which was Allergan’s worldwide generics business. *Id.* at ¶¶

the ESPP); and (6) the legal representatives, heirs, estates, agents, successors, or assigns of any person or entity described in the preceding five categories.

⁶ Familiarity with the underlying facts of this case is presumed. For a fuller factual recitation, *see Ontario Teachers’ Pension Plan Bd. v. Teva Pharm. Indus., Ltd.*, 432 F. Supp. 3d 131, 146–50 (D. Conn. 2019).

8, 93. To aid in that acquisition, Teva made a stock offering in December 2015 and a notes offering in July 2016.⁷ *See id.* at ¶¶ 407–08.

In the middle of 2015, the Plaintiffs claim that Teva’s house of cards began to come crashing down. *See id.* at ¶ 279. Around that time, investigations into the generic drug industry picked up pace and pressure grew on Teva to explain its financial success. *See id.* at ¶¶ 101–02, 105, 117. Teva’s stock price sank lower and lower. *See id.* at Figure 2. The Plaintiffs allege that, beginning in August 2016, a series of “negative events and disclosures” revealed the truth to the market. *See id.* at ¶¶ 338–76. On May 10, 2019, the Attorneys General from 47 States, the District of Columbia, and Puerto Rico filed a 524-page antitrust complaint regarding the generic drug industry that contained detailed allegations with respect to Teva’s alleged collusive conduct. *See id.* at ¶ 374; *see also* Compl., Doc. No. 1, in *Connecticut, et al. v. Sandoz, Inc., et al.*, No. 3:20-cv-802 (D. Conn.) (SRU). In August 2020 (outside the Class Period), Teva Pharmaceuticals USA, Inc.—Teva’s United States subsidiary—was charged in a criminal complaint by the United States Department of Justice’s Antitrust Division for conduct relating to its alleged collusion to fix certain generic drug prices. *See Press Release*, U.S. DEP’T OF JUSTICE, <https://www.justice.gov/opa/pr/seventh-generic-drug-manufacturer-charged-ongoing-criminal-antitrust-investigation> (Aug. 25, 2020).

Throughout the Class Period (February 6, 2014 through May 10, 2019), the Plaintiffs claim that Teva publicly attributed its financial success to good business decisions when, in fact, that success was due to artificial (and collusive) price increases on generic drugs. *See* SAC, Doc.

⁷ More specifically, in December 2015, Teva commenced a secondary public offering of ADS and an initial public offering of Preferred Shares. Each ADS represented one ordinary share of Teva, and each Preferred Share automatically converted into between 13.3333 and 16 ADS on December 15, 2018, subject to anti-dilution adjustments. *See* SAC, Doc. No. 310, at ¶ 417. Teva closed those two offerings on December 8, 2015. After certain underwriters exercised their options to purchase additional ADS and Preferred Shares “to cover overallocments,” Teva’s net proceeds from the two offerings were \$7.24 billion. *See id.* at ¶¶ 420–21. On July 21, 2016, “Teva consummated, through Teva Finance,” an offering of \$15 billion in various debt securities. *Id.* at ¶ 425. Teva garnered net proceeds of \$14.9 billion from the Notes offering. *See id.*

No. 310, at ¶ 1, 165. Thus, the Plaintiffs claim that Teva violated sections 10(b) and 20(a) of the Securities Exchange Act of 1934 (“Exchange Act”), 15 U.S.C. §§ 78j(b), 78t(a), and Rule 10b-5 promulgated thereunder, 17 C.F.R. § 240.10b-5; sections 11, 12(a)(2) and 15 of the Securities Act of 1933 (“Securities Act”), 15 U.S.C. §§ 77k(a), 77l(a)(2), and 77o(a); and breached certain state common law duties and agreements. *See id.* at ¶¶ 380–86 (Exchange Act); ¶¶ 438–64 (Securities Act); ¶¶ 465–85 (state common law).

Regarding the Exchange Act claims, the Plaintiffs allege that—between February 6, 2014 and February 19, 2019—the Defendants⁸ made a series of misstatements and omissions in (1) press releases, (2) earnings calls, (3) SEC filings, (4) guidance calls, (5) and at conferences. *See id.* at ¶¶ 176–267. With respect to the Securities Act claims, the Plaintiffs allege that the Defendants⁹ made false and misleading statements and omissions in offering materials relating to (1) the December 2015 secondary public offering of ADS and initial public offering of Preferred Shares, (2) the July 2016 notes offering, and (3) a July 2010 ADS offering.¹⁰ *See id.* at ¶¶ 417–437. Regarding the state common law claims, the Plaintiffs allege that the Defendants¹¹ breached their fiduciary duty, made misrepresentations and actionable non-disclosures, and breached contractual obligations to class members who acquired ADS through the ESPP. *See id.* at ¶¶ 465–85.

II. Standard of Review and Relevant Law

A. Class Certification pursuant to Rule 23

⁸ The defendants for the Exchange Act claims are: Teva, Vigodman, Desheh, Olafsson, Griffin, Schultz, McClellan, and Petersburg. *See* SAC, Doc. No. 310, at ¶¶ 25–33.

⁹ The defendants for the Securities Act claims are: Teva, Teva Finance, Vigodman, Desheh, and Griffin. *See* SAC, Doc. No. 310, at ¶¶ 411–15.

¹⁰ Although the July 2010 ADS offering occurred outside the Class Period, the Registration Statement that Teva filed with the SEC in connection with the July 2010 ADS offering incorporated many of Teva’s future SEC filings, some of which occurred during the Class Period. *See* SAC, Doc. No. 310, at ¶ 426–27.

¹¹ The defendants for the state law claims are: Teva, Vigodman, and Desheh. *See* SAC, Doc. No. 310, at ¶¶ 465–85.

To proceed as a class action suit, a plaintiff must establish by a preponderance of the evidence that the suit satisfies all four requirements of Rule 23(a) and fits into one of the categories of Rule 23(b). *See Johnson v. Nextel Commc'ns Inc.*, 780 F.3d 128, 137 (2d Cir. 2015). “[C]ertification is proper only if the trial court is satisfied, after a rigorous analysis, that” Rule 23’s requirements have been satisfied. *Wal-Mart Stores, Inc. v. Dukes*, 564 U.S. 338, 350–51 (2011) (quoting *Gen. Tel. Co. of Sw. v. Falcon*, 457 U.S. 147, 161 (1982)) (cleaned up). Although “a court’s class-certification analysis must be rigorous and may entail some overlap with the merits of the plaintiff’s underlying claim, Rule 23 grants courts no license to engage in free-ranging merits inquiries at the certification stage.” *Amgen Inc. v. Conn. Ret. Plans and Tr. Funds*, 568 U.S. 455, 465–66 (2013) (quoting *Wal-Mart*, 564 U.S. at 351) (cleaned up). “Merits questions may be considered to the extent—but only to the extent—that they are relevant to determining whether the Rule 23 prerequisites for class certification are satisfied.” *Id.* at 466; *see also Ark. Teacher Ret. Sys. v. Goldman Sachs Grp., Inc.*, 955 F.3d 254, 268 (2d Cir. 2020) (“*ARTS IP*”).

1. Rule 23(a)

Rule 23(a) lays out four prerequisites for any class action lawsuit: numerosity, commonality, typicality, and adequacy.

Numerosity requires that the class be “so numerous that joinder of all members is impracticable.” Fed. R. Civ. P. 23(a)(1). “Numerosity is presumed for classes larger than forty members.” *Penn. Pub. School Emps.’ Ret. Sys. v. Morgan Stanley & Co., Inc.*, 772 F.3d 111, 120 (2d Cir. 2014). “[P]laintiffs need not provide evidence of an exact class size to establish numerosity.” *Kaplan v. S.A.C. Capital Advisors, L.P.*, 311 F.R.D. 373, 378 (S.D.N.Y. 2015) (citing *Robidoux v. Celani*, 987 F.2d 931, 935 (2d Cir. 1993)). “In securities fraud class actions

relating to publicly owned and nationally listed corporations, the numerosity requirement may be satisfied by a showing that a large number of shares were outstanding and traded during the relevant period.” *In re Bank of Am. Corp. Sec., Derivative, & Emp. Ret. Income Sec. Act (ERISA) Litig.*, 281 F.R.D. 134, 138 (S.D.N.Y. 2012) (quoting *Teachers’ Ret. Sys. of La. v. ACLN Ltd.*, 2004 WL 2997957, at *3 (S.D.N.Y. Dec. 27, 2004)) (cleaned up).

Commonality requires that there be “questions of law or fact common to the class.” Fed. R. Civ. P. 23(a)(2). Commonality “is generally satisfied by the existence of a single issue of law or fact that is common across all class members and is thus easily met in most cases.” 1 William B. Rubenstein, *Newberg on Class Actions* § 3:18 (5th ed.) (Westlaw 2021); *Kaplan*, 311 F.R.D. at 378 (characterizing the commonality requirement as a “low hurdle”). “In the context of a securities class action, common questions of law and fact include whether certain statements were false and misleading, whether those statements violated the federal securities laws, whether those statements were knowingly and recklessly issued, and ensuing causation issues.” *In re Petrobras Sec. Litig.*, 312 F.R.D. 354, 359 (S.D.N.Y. 2016), *aff’d in part and vacated in part*, 862 F.3d 250 (2d Cir. 2017) (“*Petrobras P*”) (quoting *Penn. Ave. Funds v. Inyx Inc.*, 2011 WL 2732544, at *4 (S.D.N.Y. July 5, 2011)) (cleaned up); *see also McIntire v. China MediaExpress Holdings, Inc.*, 38 F. Supp. 3d 415, 424 (S.D.N.Y. 2014) (“Where plaintiffs allege that class members have been injured by similar material misrepresentations and omissions, the Commonality Requirement is satisfied.”).

Typicality requires that “the claims or defenses of the representative parties”—here, the Plaintiffs—“are typical of the claims or defenses of the class.” Fed. R. Civ. P. 23(a)(3). Typicality “is satisfied when each class member’s claim arises from the same course of events, and each class member makes similar legal arguments to prove the defendant’s liability.” *Cent.*

States Se. and Sw. Areas Health & Welfare Fund v. Merck-Medco Managed Care, L.L.C., 504 F.3d 229, 245 (2d Cir. 2007) (cleaned up). Typicality does not require that the representative parties' claims "be identical to those of all class members." *Wilson v. LSB Indus., Inc.*, 2018 WL 3913115, at *4 (S.D.N.Y. Aug. 13, 2018) (quoting *Frank v. Eastman Kodak Co.*, 228 F.R.D. 174, 182 (W.D.N.Y. 2005)) (cleaned up). "In securities actions, in particular, typicality is 'not demanding.'" *In re Deutsche Bank AG Sec. Litig.*, 328 F.R.D. 71, 80 (S.D.N.Y. 2018) (quoting *Tsereteli v. Residential Asset Securitization Trust 2006-A8*, 283 F.R.D. 199, 208 (S.D.N.Y. 2012)). "So long as plaintiffs assert that defendants committed the same wrongful acts in the same manner, against all members of the class, they establish the necessary typicality." *Id.* (cleaned up).

Adequacy requires that "the representative parties will fairly and adequately protect the interests of the class." Fed. R. Civ. P. 23(a)(4). "Adequacy 'entails inquiry as to whether: 1) plaintiff's interests are antagonistic to the interest of other members of the class and 2) plaintiff's attorneys are qualified, experienced and able to conduct the litigation.'" *In re Flag Telecom Holdings, Ltd. Sec. Litig.*, 574 F.3d 29, 35 (2d Cir. 2009) (quoting *Baffa v. Donaldson, Lufkin & Jenrette Sec. Corp.*, 222 F.3d 52, 60 (2d Cir. 2000)). "The focus is on uncovering 'conflicts of interest between named parties and the class they seek to represent.'" *Id.* (quoting *Amchem Prods., Inc. v. Windsor*, 521 U.S. 591, 625 (1997)). "Only conflicts that are fundamental to the suit and that go to the heart of the litigation prevent a plaintiff from meeting the Rule 23(a)(4) adequacy requirement." 1 William B. Rubenstein, *Newberg on Class Actions* § 3:58 (5th ed.) (Westlaw 2021).

2. Rule 23(b)

The only Rule 23(b) category relevant to this case is Rule 23(b)(3). Pursuant to Rule 23(b)(3), plaintiffs may maintain a class action if (1) “questions of law or fact common to class members predominate over any questions affecting only individual members,” and (2) “a class action is superior to other available methods for fairly and efficiently adjudicating the controversy.” Fed. R. Civ. P. 23(b)(3). Requirement (1) is called the “predominance” requirement. Requirement (2) is called the “superiority” requirement.

a. Predominance

“Considering whether ‘questions of law or fact common to class members predominate’ begins, of course, with the elements of the underlying cause of action.” *Erica P. John Fund, Inc. v. Halliburton Co.*, 563 U.S. 804, 809 (2011) (“*Halliburton I*”). The proposed Class asserts several causes of action.

i. Securities Act

The proposed Class brings claims pursuant to sections 11, 12(a)(2), and 15¹² of the Securities Act. See SAC, Doc. No. 310, at ¶¶ 438–64. “Section 11 of the Securities Act prohibits materially misleading statements or omissions in registration statements filed with the SEC.” *In re Morgan Stanley Info. Fund Sec. Litig.*, 592 F.3d 347, 358 (2d Cir. 2010) (citing 15 U.S.C. § 77k(a)).

To state a claim under section 11, the plaintiff must allege that: (1) she purchased a registered security, either directly from the issuer or in the aftermarket following the offering; (2) the defendant participated in the offering in a manner sufficient to give rise to liability under section 11; and (3) the registration statement contained an untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary to make the statements therein not misleading.

Id. at 358–59 (cleaned up). To state a claim under section 12(a)(2), a plaintiff must show:

¹² Section 15 allows for “control person” liability that depends on a primary violation of sections 11 or 12(a)(2). See *In re Morgan Stanley Info. Fund Sec. Litig.*, 592 F.3d 347, 358 (2d Cir. 2010).

(1) the defendant is a “statutory seller”; (2) the sale was effectuated by means of a prospectus or oral communication; and (3) the prospectus or oral communication included an untrue statement of a material fact or omitted to state a material fact necessary in order to make the statements, in light of the circumstances under which they were made, not misleading.

Id. at 359 (citing 15 U.S.C. § 77l(a)(2)) (cleaned up).

Notably, “unlike securities fraud claims pursuant to section 10(b)” of the Exchange Act, “plaintiffs bringing claims under sections 11 and 12(a)(2) need not allege scienter, reliance, or loss causation.” *Id.*; *see also Fait v. Regions Fin. Corp.*, 655 F.3d 105, 109 (2d Cir. 2011). “Section 11 imposes virtually absolute liability on issuers, and Section 11 and Section 12(a)(2) impose liability on other parties for mere negligence.” *In re MF Glob. Holdings Ltd. Sec. Litig.*, 982 F. Supp. 2d 277, 308 (S.D.N.Y. 2013) (cleaned up). “In many cases . . . two issues are central to claims under sections 11 and 12(a)(2): (1) the existence of either a misstatement or an unlawful omission; and (2) materiality.” *In re Morgan Stanley*, 592 F.3d at 360.

ii. State Law

The Plaintiffs also assert three state common law claims on behalf of Teva employees who purchased or acquired ADS through Teva’s ESPP: (1) breach of fiduciary duty, (2) misrepresentation and non-disclosure, and (3) breach of contract. *See* SAC, Doc. No. 310, at ¶¶ 465–85. The Plaintiffs added those three state common law claims to the SAC, in part, to enable a smooth consolidation of these actions. *See Ontario Teachers’ Pension Plan Bd. v. Teva Pharm. Indus., Ltd.* (“Ontario Teachers’ Consolidation Ruling”), 2020 WL 1181366, at *7, *12–13 (D. Conn. Mar. 10, 2020).

A district court must undertake a “considered analysis of the variations in state law and the potential need for subclasses that might result from those variations.” *Langan v. Johnson & Johnson Consumer Cos., Inc.*, 897 F.3d 88, 98 (2d Cir. 2018); *see also* 2 William B. Rubenstein,

Newberg on Class Actions § 4:61 (5th ed.) (Westlaw 2021) (discussing choice of law concerns). The Plaintiffs have “the ultimate burden to demonstrate that any variations in relevant state laws do not predominate over the similarities.” *Langan*, 897 F.3d at 97.

iii. Exchange Act

The proposed Class brings claims pursuant to sections 10(b) and 20(a)¹³ of the Exchange Act and Rule 10b-5 promulgated thereunder. *See* SAC, Doc. No. 310, at ¶¶ 380–86.

The elements of a private securities fraud claim based on violations of § 10(b) and Rule 10b-5 are: (1) a material misrepresentation or omission by the defendant; (2) scienter; (3) a connection between the misrepresentation or omission and the purchase or sale of a security; (4) reliance upon the misrepresentation or omission; (5) economic loss; and (6) loss causation.

Halliburton I, 563 U.S. at 809–10 (quoting *Matrixx Initiatives, Inc. v. Siracusano*, 563 U.S. 27, 37–38 (2011)) (cleaned up). In most securities class actions, common questions of law and fact clearly predominate over individual ones for all the above elements other than reliance. *See, e.g., id.* at 810 (“Whether common questions of law or fact predominate in a securities fraud action often turns on the element of reliance.”); *In re Pfizer Inc. Sec. Litig.*, 282 F.R.D. 38, 52 (S.D.N.Y. 2012); *In re Parmalat Sec. Litig.*, 2008 WL 3895539, at *8 (S.D.N.Y. Aug. 21, 2008).

In the normal course, a plaintiff claiming a violation of section 10(b) and Rule 10b-5 “can demonstrate reliance [] by showing that he was aware of a company’s statement and engaged in a relevant transaction—*e.g.*, purchasing common stock—based on that specific misrepresentation.” *Halliburton I*, 563 U.S. at 810. However, in a large, impersonal marketplace, many who buy or sell a company’s securities do not do so in reliance on a company’s statements. *See Basic Inc. v. Levinson*, 485 U.S. 224, 243–44 (1988) (“The modern securities markets, literally involving millions of shares changing hands daily, differ from the face-to-face transactions contemplated

¹³ Section 20(a) allows for “control person” liability and depends on a primary violation of, as relevant here, Section 10(b). *See Suez Equity Inv’rs, L.P. v. Toronto-Dominion Bank*, 250 F.3d 87, 101 (2d Cir. 2001).

by early fraud cases.”). Requiring plaintiffs to prove individual reliance in such a large, impersonal marketplace “would prevent such plaintiffs from proceeding with a class action, since individual issues would overwhelm the common ones.” *Halliburton I*, 563 U.S. at 810 (quoting *Basic*, 485 U.S. at 242).

Thus, in *Basic*, the Court established a presumption that Rule 10b-5 plaintiffs could invoke to establish reliance when proving individual reliance would be impossible. The *Basic* Court held that “where materially misleading statements have been disseminated into an impersonal, well-developed market for securities, the reliance of individual plaintiffs on the integrity of the market price may be presumed.” *Basic*, 485 U.S. at 247. That presumption was based on common sense, probability, and the “fraud-on-the-market” theory. *See id.* at 246–47. The fraud-on-the-market theory relies on “the hypothesis that, in an open and developed securities market, the price of a company’s stock is determined by the available material information regarding the company and its business.” *Id.* at 241 (quoting *Peil v. Speiser*, 806 F.2d 1154, 1160–61 (3d Cir. 1986)). “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.* at 247.

A plaintiff successfully invokes the *Basic* presumption by proving that “(1) the alleged misrepresentations were publicly known, (2) they were material, (3) the stock traded in an efficient market, and (4) the plaintiff traded the stock between when the misrepresentations were made and when the truth was revealed.” *Halliburton Co. v. Erica P. John Fund, Inc.*, 573 U.S. 258, 277–78 (2014) (“*Halliburton II*”). Importantly, the Supreme Court has held that a plaintiff need not prove materiality before class certification: That is a merits issue. *See id.* at 282; *see also Amgen*, 568 U.S. at 474 (“Because a failure of proof on the issue of materiality, unlike the

issues of market efficiency and publicity, does not give rise to any prospect of individual questions overwhelming common ones, materiality need not be proved prior to Rule 23(b)(3) class certification.”). “[M]arket efficiency and the other prerequisites for invoking the [*Basic*] presumption constitute an indirect way of showing price impact.”¹⁴ *Halliburton II*, 573 U.S. at 281.

The *Basic* presumption is rebuttable. A defendant may rebut the *Basic* presumption with “[a]ny showing that severs the link between the alleged misrepresentation and either the price received (or paid) by the plaintiff, or his decision to trade at a fair market price.” *Basic*, 485 U.S. at 248. Put differently, “if a defendant could show that the alleged misrepresentation did not, for whatever reason, actually affect the market price, or that a plaintiff would have bought or sold the stock even had he been aware that the stock’s price was tainted by fraud, then the presumption of reliance would not apply.” *Halliburton II*, 573 U.S. at 269. As relevant here, a defendant might rebut the *Basic* presumption by showing that the market for a particular security was *not* efficient and, thus, that there was a lack of price impact. *See Halliburton II*, 573 U.S. at 283. A defendant seeking to rebut the *Basic* presumption must do so by a preponderance of the evidence. *See Waggoner v. Barclays PLC*, 875 F.3d 79, 99–103 (2d Cir. 2017).

Basic has been the subject of much academic criticism. Specifically, how courts should measure and evaluate “market efficiency”¹⁵ has spurred vigorous debate since almost the time

¹⁴ Price impact means that “a misrepresentation was reflected in the market price at the time of the transaction.” *Halliburton II*, 573 U.S. at 283 (quoting *Halliburton I*, 563 U.S. at 813) (cleaned up).

¹⁵ When I refer to “market efficiency” in this ruling, unless I say otherwise I refer to “semi-strong-form market efficiency.” Pursuant to the efficient markets hypothesis, there are three forms of market efficiency. The first is weak-form efficiency. If a market is weak-form efficient, then “the price of a stock rapidly incorporates all information contained in prior stock prices.” Expert Report of David I. Tabak, Doc. No. 419-5, at ¶ 10. Weak-form efficiency is relevant to my discussion below regarding autocorrelation. The second is semi-strong-form efficiency. If a market is semi-strong-form efficient, “the price of a stock rapidly incorporates all publicly available information.” *Id.* The third is strong-form efficiency. If a market is strong-form efficient, “the price of a stock rapidly incorporates all public and private information,” such that a trader with “inside” information will not be

Basic was decided.¹⁶ Nevertheless, as recently as 2014, the Supreme Court explicitly reaffirmed *Basic*. See *Halliburton II*, 573 U.S. at 266. In doing so, the *Halliburton II* Court rejected the argument that the *Basic* presumption was no longer justified based on “overwhelming empirical evidence now suggest[ing] that capital markets are not fundamentally efficient.” *Id.* at 270 (cleaned up). The *Halliburton II* Court continued:

To recognize the presumption of reliance, the [*Basic*] Court explained, was not “conclusively to adopt any particular theory of how quickly and completely publicly available information is reflected in market price.” The Court instead based the presumption on the fairly modest premise that “market professionals generally consider most publicly announced material statements about companies, thereby affecting stock market prices.” *Basic*’s presumption of reliance thus does not rest on a “binary” view of market efficiency. Indeed, in making the presumption rebuttable, *Basic* recognized that market efficiency is a matter of degree and accordingly made it a matter of proof.

Id. at 271–72 (quoting *Basic*, 485 U.S. at 246–48 & nn. 24, 28) (cleaned up). Thus, as the Second Circuit has recognized: Although the Supreme Court has “declined to define a precise evidentiary standard for market efficiency, [] the Court’s opinions consistently suggest that the

expected to do better than anyone else. *Id.*; see also Eugene F. Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25 J. OF FIN. 383, 388 (1970).

When discussing “market efficiency” in the context of the *Basic* presumption, courts agree that semi-strong-form efficiency is the relevant form. See, e.g., *In re Initial Pub. Offering Sec. Litig.*, 260 F.R.D. 81, 97 n.148 (S.D.N.Y. 2009) (“The semi-strong form is the form that generally concerns courts.”) (citing *ATSI Commc’ns, Inc. v. Shaar Fund, Ltd.*, 493 F.3d 87, 100 n.4 (2d Cir. 2007)); Allen Ferrell & Andrew Roper, *Price Impact, Materiality, and Halliburton II*, 93 WASH. U. L. REV. 553, 557 n.13 (“Courts have generally agreed that the relevant form of the efficient market hypothesis is semi-strong form efficiency.”).

¹⁶ See Jonathan R. Macey, et al., *Lessons from Financial Economics: Materiality, Reliance, and Extending the Reach of Basic v. Levinson*, 77 VA. L. REV. 1017, 1018 (Aug. 1991) (“[S]ubstantial disagreement exists about to what degree markets are efficient, how to test for efficiency, and even the definition of efficiency.”); Donald C. Langevoort, *Basic at Twenty: Rethinking Fraud on the Market*, 2009 WIS. L. REV. 151, 166–78 (2009) (describing the “judicial muddle” that ensued when lower courts began evaluating whether various markets were “efficient”); Charles W. Murdock, *Halliburton, Basic, and Fraud on the Market: The Need for a New Paradigm*, 60 VILL. L. REV. 203, 233–34 (2015) (pointing out, by way of example, that “two Nobel Prize winners in economics, Eugene Fama and Robert Shiller, have taken opposing positions on whether the market is efficient, Fama arguing that it is efficient and Shiller arguing that it is not”); Lucian A. Bebchuk & Allen Ferrell, *Rethinking Basic*, 69 BUS. LAW. 671, 676–77 (May 2014) (describing the debate between Fama and Shiller); J.B. Heaton, *Kill Cammer: Securities Litigation Without Junk Science*, 11 WM. & MARY BUS. L. REV. 417, 424–26 (Feb. 2020) (arguing that all that is required to invoke the *Basic* presumption is that the market for that particular security be “free and open,” not that it be “efficient”).

burden is not an onerous one.” *In re Petrobras Sec.*, 862 F.3d 250, 278 (2d Cir. 2017) (“*Petrobras II*”).

The Second Circuit, too, has “repeatedly—and recently—declined to adopt a particular test for market efficiency.” *Waggoner*, 875 F.3d at 94. However, the Second Circuit has acknowledged that district courts in the Second and other Circuits “regularly consider” the *Cammer* factors and the *Krogman* factors in evaluating whether a particular security trades in an “efficient” market. *See id.* at 94–95.

The five *Cammer* factors are: (1) the security’s weekly trading volume; (2) the amount of analyst coverage; (3) the existence and extent of market makers and arbitrageurs; (4) whether the company can file a simplified SEC Form S-3 registration statement; and (5) whether empirical facts show “a cause and effect relationship between unexpected corporate events or financial releases and an immediate response in the stock price.” *See Cammer v. Bloom*, 711 F. Supp. 1264, 1286–87 (D.N.J. 1989). *Cammer* 1 through 4 are known as “indirect” factors because they “examine indirect indicia of market efficiency for a particular security.” *Waggoner*, 875 F.3d at 94 (quoting *Petrobras II*, 862 F.3d at 276).

Regarding *Cammer* 1, having a high weekly trading volume indicates market efficiency because it “implies significant investor interest in the company,” and, in turn, “a likelihood that many investors are executing trades on the basis of newly available or disseminated corporate information.” *Cammer*, 711 F. Supp. at 1286. The *Cammer* Court explained that an “average weekly trading [volume] of two percent or more of the outstanding shares would justify a strong presumption that the market for the security is an efficient one” and that “one percent would justify a substantial presumption.” *Id.*

With respect to *Cammer* 2, the existence of a “significant number” of analysts covering a company’s securities implies that analysts scrutinized information regarding the company to, eventually, “make buy/sell recommendations to client investors.” *Id.* In that way, “the market price of the stock would be bid up or down to reflect the financial information” released to the market. *Id.*

Regarding *Cammer* 3, “[t]he existence of market makers and arbitrageurs would ensure completion of the market mechanism” because “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.” *Id.* at 1286–87. The *Cammer* Court indicated that a number of market makers above ten would “justify a substantial presumption that the market for the security is an efficient one.” *Id.* at 1293.

Cammer 4 concerns a particular SEC form. “A Form F-3 is the equivalent of a Form S-3 for foreign companies.” *Petrobras I*, 312 F.R.D. at 365. “[C]ompanies are eligible to file an F-3 or an S-3 form when, among other things, they have filed Exchange Act reports for a certain time and have a float over a certain level.” *Id.* More specifically, “[t]o file a Form S-3, a company must have filed SEC reports for twelve consecutive months and possess a \$75 million market capitalization level.” *In re Winstar Commc’ns Sec. Litig.*, 290 F.R.D. 437, 447 (S.D.N.Y. 2013) (citing 17 C.F.R. § 293.13). A company’s ability to file a Form S-3 “is predicated on the [SEC’s] belief 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.” *Cammer*, 711 F. Supp. at 1284 (quoting SEC Securities Act Release No. 6331 (Aug. 13, 1981)).

Cammer 5 is a “direct” factor because it “permits plaintiffs to submit direct evidence.” *Waggoner*, 875 F.3d at 94. “Plaintiffs generally attempt to satisfy *Cammer* 5 by submitting an event study,” which is a “regression analys[i]s that seek[s] to show that the market price of the defendant’s [security] tends to respond to pertinent publicly reported events.” *Id.* (quoting *Halliburton II*, 573 U.S. at 280). Although many courts have called *Cammer* 5 the “most important *Cammer* factor,” *Teamsters Local 445 Freight Div. Pension Fund v. Bombardier Inc.*, 546 F.3d 196, 207 (2d Cir. 2008) (cleaned up), satisfying *Cammer* 5 is not a necessary condition for showing market efficiency. *See Waggoner*, 875 F.3d at 97 (“[A] plaintiff seeking to demonstrate market efficiency need not always present direct evidence of price impact through event studies.”). In fact, the Second Circuit has explained that *Cammer* 5 is *least* important when the indirect *Cammer* factors clearly point towards a conclusion of market efficiency. *See id.* at 97–98.

The three *Krogman* factors, which are also “indirect” factors, are: (1) the company’s market capitalization, (2) the security’s bid-ask spread, and (3) the “float,” which is “the percentage of stock not held by insiders.” *Krogman v. Sterritt*, 202 F.R.D. 467, 474 (N.D. Tex. 2001). High market capitalization “may be an indicator of market efficiency because there is a greater incentive for stock purchasers to invest in more highly capitalized corporations.” *Id.* at 478. A security’s bid-ask spread can be informative: “A large bid-ask spread is indicative of an inefficient market, because it suggests that the stock is too expensive to trade.” *Id.* Finally, a high float is consistent with market efficiency: “Because 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.” *Id.* (cleaned up).

In evaluating a market's efficiency, courts sometimes consider two additional factors. The first is whether a stock traded on the New York Stock Exchange or a similar national market. If so, some courts hold that that fact "by itself is a strong indication of efficiency." *Villella v. Chemical and Mining Co. of Chile Inc.*, 333 F.R.D. 39, 54 (S.D.N.Y. 2019). The second is whether a security's prices exhibit autocorrelation (also known as serial correlation), which is when a security's historical price changes have predictive power regarding future price changes. *See id.* at 54–55. Statistically significant autocorrelation "can be an indicator of market inefficiency." *Id.* at 55 (citing *In re PolyMedica Corp. Sec. Litig.*, 453 F. Supp. 2d 260, 276–78 (D. Mass. 2006)).

All that can be a lot to consider. But recent Second Circuit guidance is useful. When determining whether a plaintiff has proven market efficiency, a district court should not "view direct and indirect evidence as distinct requirements" and should, instead, conduct "a holistic analysis based on the totality of the evidence presented." *Petrobras II*, 862 F.3d at 277. Put differently, "[t]he *Cammer* and *Krogman* factors are simply tools to help district courts analyze market efficiency in determining whether the *Basic* presumption of reliance applies in class certification decision-making." *Waggoner*, 875 F.3d at 98. "But they are no more than tools in arriving at that conclusion, and certain factors will be more helpful than others in assessing particular securities and particular markets for efficiency." *Id.*

b. Superiority

Relevant considerations regarding whether a class action is "superior to other available methods" for proceeding in the litigation are: (1) "the class members' interests in individually controlling the prosecution or defense of separate actions"; (2) "the extent and nature of any litigation concerning the controversy already begun by or against class members"; (3) "the

desirability or undesirability of concentrating the litigation of the claims in the particular forum”; and (4) “the likely difficulties in managing a class action.” Fed. R. Civ. 23(b)(3)(A)–(D). In general, “[s]ecurities suits easily satisfy the Superiority Requirement of Rule 23(b)(3) because ‘the alternatives are either no recourse for thousands of stockholders’ or ‘a multiplicity and scattering of suits with the inefficient administration of litigation which follows in its wake.’” *Kaplan*, 311 F.R.D. at 383 (quoting *Green v. Wolf Corp.*, 406 F.2d 291, 301 (2d Cir. 1968)); *see also In re SunEdison, Inc. Sec. Litig.*, 329 F.R.D. 124, 144 (S.D.N.Y. 2019); 7 William B. Rubenstein, *Newberg on Class Actions* § 22:82 (5th ed.) (Westlaw 2021) (“[T]he superiority requirement is easily met in most securities class actions.”).

The Defendants do not argue that the Plaintiffs fail to satisfy the superiority requirement. I hold that the Plaintiffs have shown that “a class action is superior to other available methods for fairly and efficiency adjudicating” this controversy, Fed. R. Civ. P. 23(b)(3), based on the “dispersed nature of the class.” *Menaldi v. Och-Ziff Capital Mgmt. Grp., LLC*, 328 F.R.D. 86, 100 (S.D.N.Y. 2018); *see also In re Vale S.A. Sec. Litig.*, 2019 WL 11032303, at *14 n.11 (S.D.N.Y. Sept. 27, 2019).

3. Implied Requirement: Ascertainability

Rule 23 also contains an implied ascertainability requirement. *See Petrobras II*, 862 F.3d at 257. “[A] class is ascertainable if it is defined using objective criteria that establish a membership with definite boundaries.” *Id.* The proposed Class here is ascertainable because records document the purchasers of the relevant Teva securities.

B. Daubert Standard at Class Certification Stage

It is still an open issue whether and to what extent a district court should conduct a *Daubert* analysis at the class certification stage. *See, e.g., Kurtz v. Costco Wholesale Corp.*, 818

F. App'x 57, 61 n.3 (2d Cir. 2020); 3 William B. Rubenstein, *Newberg on Class Actions* § 7:24 (5th ed.) (Westlaw 2021). In my view, the Supreme Court and Second Circuit have hinted that district courts should undertake a full *Daubert* analysis at the class certification stage, when necessary. *See Wal-Mart*, 564 U.S. at 354 (expressing “doubt” at the district court’s conclusion that “*Daubert* did not apply to expert testimony at the certification stage of class-action proceedings”); *In re U.S. Foodservice, Inc. Pricing Litig.*, 729 F.3d 108, 129–30 (2d Cir. 2013) (highlighting the Supreme Court’s *dicta* in *Wal-Mart* and “disavow[ing] our earlier statement that ‘an expert’s testimony may establish a component of a Rule 23 requirement simply by not being fatally flawed’”) (quoting *In re Initial Public Offering Sec. Litig.*, 471 F.3d 24, 42 (2d Cir. 2004)). Indeed, many lower courts conduct full *Daubert* analyses at the class certification stage. *See, e.g., In re LIBOR-Based Fin. Instruments Antitrust Litig.*, 299 F. Supp. 3d 430, 470–71 (S.D.N.Y. 2018); 1 McLaughlin on Class Actions § 3:14 (17th ed.) (Westlaw 2021) (“[A] majority of courts has accepted that the requirements of *Daubert* and Rule 702 apply with full force at the class certification stage.”). For those reasons, I will undertake a full *Daubert* analysis.

Federal Rule of Evidence 702 guides the admissibility of expert testimony. Rule 702 reads:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

- (a) the expert’s scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and

(d) the expert has reliably applied the principles and methods to the facts of the case.

Fed. R. Evid. 702. In assessing the admissibility of expert testimony, the trial court plays a “gatekeeping role.” *See Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 597 (1993). The “first question” in a *Daubert* analysis is “whether the expert has sufficient qualifications to testify.” *Davis v. Carroll*, 937 F. Supp. 2d 390, 412 (S.D.N.Y. 2013) (quoting *Humphrey v. Diamant Boart, Inc.*, 556 F. Supp. 2d 167, 174 (E.D.N.Y. 2008)). If the expert is qualified, a trial judge must “ensur[e] that an expert’s testimony both rests on a reliable foundation and is relevant to the task at hand.” *Daubert*, 509 U.S. at 597; *see also Wills v. Amerada Hess Corp.*, 379 F.3d 32, 48 (2d Cir. 2004) (instructing that the “district court must consider both the reliability and relevance of the proffered testimony”). More specifically, a district court determines “whether the reasoning and methodology underlying the testimony is scientifically valid” and “whether that reasoning or methodology properly can be applied to the facts in issue.” *Daubert*, 509 U.S. at 592–93. A trial court properly focuses “solely on principles and methodology, not on the conclusions that they generate.” *Id.* at 595.

In *Daubert*, which addressed scientific expert testimony, the Court set out a list of non-exclusive factors a trial court might consider in assessing the reliability of an expert’s reasoning or methodology: (1) whether the theory or technique on which the expert relies has been tested—that is, whether the expert’s theory can be challenged in an objective sense, or whether it is instead simply a subjective, conclusory approach that cannot reasonably be assessed for reliability; (2) whether the theory or technique has been subject to peer review and publication; (3) the known or potential rate of error of the technique when applied and the existence of standards controlling the technique’s operation; and (4) whether the method has been generally

accepted by the scientific community. *See id.* at 593–94; Fed. R. Evid. 702 advisory committee’s note to 2000 amendment.

However, a trial court’s inquiry is “flexible,” *Daubert*, 509 U.S. at 594, and “*Daubert*’s list of specific factors neither necessarily nor exclusively applies to all experts or in every case.” *Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 141 (1999). The idea behind *Daubert* “is to make certain that an expert . . . employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.” *Id.* at 152. A district court should remember that the Federal Rules of Evidence have a “liberal thrust” and have a “general approach of relaxing the traditional barriers to ‘opinion’ testimony.” *Daubert*, 509 U.S. at 589 (cleaned up). “Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.” *Id.* at 596. “But nothing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert.” *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997).

III. Discussion

I will certify the proposed Class because the Plaintiffs have established all the prerequisites of Rule 23(a) and Rule 23(b)(3).

A. Rule 23(a) Requirements: All Undisputed

The Defendants do not dispute that the Plaintiffs’ proposed Class satisfies the four prerequisites of Rule 23(a). *See* Defs.’ Mem. of Law in Opp’n to Class Cert. (“Defs.’ Class Cert. Opp’n”), Doc. No. 508. And for good reason: Rule 23(a) is satisfied.

With respect to numerosity, the proposed Class will likely include thousands of members, which is well above the 40-member threshold that triggers a presumption in favor of numerosity.

Throughout the Class Period, Teva always had over 700 million ADS outstanding, and the average weekly trading volume was over 40 million ADS. *See* Ex. 3-a to Expert Report of David I. Tabak, Doc. No. 419-5, at 115–21 (the “Tabak Report”). Throughout the Preferred Shares’ existence,¹⁷ there were just under 4 million shares outstanding, and the average weekly trading volume was over 180,000. *See* Ex. 3-b to Tabak Report, Doc. No. 419-5, at 123–27. Teva issued about \$15 billion in Notes in July 2016. *See* SAC, Doc. No. 310, at ¶ 425. Those Notes were traded regularly. *See* Ex. 3-c to Tabak Report, Doc. No. 419-5, at 128–29 (all over 21,000 per week, on average).

With respect to commonality, in this case there are numerous common questions of law and fact, including: Did the Defendants make misstatements and omissions in SEC filings, press releases, on conference calls with analysts, and in relevant offering documents? If so, were those misstatements and omissions material? Did the Defendants act with scienter (for the Exchange Act claims)? Similarly, I have already explained that the state common law claims share numerous common questions of fact with the federal securities law claims. *See Ontario Teachers’ Consolidation Ruling*, 2020 WL 1181366, at *7 (remarking that “the facts necessary to prove the state common law claims . . . will be nearly identical to the facts necessary to prove the federal securities law claims . . . : both kinds of claims are premised on Teva and certain of its officers and directors’ false and misleading statements regarding the reasons behind Teva’s financial success during the same period of time”).

Regarding typicality and adequacy, I have already ordered—pursuant to the parties’ stipulation—that the Defendants cannot challenge the Plaintiffs’ typicality and adequacy. *See*

¹⁷ The Preferred Shares were offered on Dec. 3, 2015 and were converted into 16 ADS on Dec. 17, 2018. *See supra* n.7; *see also* Ex. 3-b to Tabak Report, Doc. No. 419-5, at 127 n.1.

Order, Doc. No. 352, at ¶ 7.¹⁸ Even if the Defendants had mounted a challenge, though, the Plaintiffs plainly satisfy Rule 23(a)'s typicality and adequacy requirements.

The Plaintiffs are typical of the proposed Class's members. Ontario Teachers' bought and sold ADS between February 19, 2014 and January 22, 2018 and Preferred Shares between December 17, 2015 and August 16, 2016. *See* App. D to SAC, Doc. No. 310. Further, Anchorage Police & Fire purchased 2026 Notes twice in 2016 and sold them in 2017. *See id.* The Plaintiffs pursue the same federal securities law claims as the rest of the putative class, and the additional state common law claims are entirely similar in that they depend on the same factual issues.

Regarding adequacy, the Plaintiffs have no apparent conflicts of interest, let alone any "fundamental" ones that might render them inadequate class representatives. Plaintiffs' attorneys are "qualified, experienced and able to conduct the litigation." *Baffa*, 222 F.3d at 60; *see also* Firm Resumes, Doc. Nos. 419-6 and -7. Throughout the course of this litigation, I have engaged with Plaintiffs' counsel in oral arguments and reviewed many of their written submissions. I am satisfied that Plaintiffs' counsel are pursuing the Class's claims vigorously.

B. Rule 23(b)(3) Predominance: Undisputed for the Securities Act and State Common Law Claims

The Defendants do not oppose class certification regarding the proposed Class's Securities Act claims. The Defendants' arguments are limited to (1) whether the ADS, Preferred Shares, and Notes (together, the "Teva Securities") traded in efficient markets, and (2) whether the proposed Class's damages are calculable on a classwide basis. Whether the Teva Securities

¹⁸ Recently, the Defendants sought to re-open discovery to explore the Plaintiffs' securities trading activity. *See* Defs.' Submissions, Doc. Nos. 719, 720. That discovery would have regarded, most directly, the Plaintiffs' typicality and adequacy. I denied the Defendants' request on the record at a status conference on March 3, 2021. *See* Conf. Mem. and Order, Doc. No. 729, at 3–4. In a subsequent written order, I more fully explained my decision. *See* Order, Doc. No. 735.

traded in efficient markets is relevant to the “reliance” element of a Rule 10b-5 claim. But, as described above, plaintiffs asserting claims pursuant to Sections 11 and 12(a)(2) of the Securities Act need not prove reliance. *See Fait*, 655 F.3d at 109. Further, the measure of damages for violations of Sections 11 and 12(a)(2) of the Securities Act does not depend on a classwide method of measurement because the damages for those violations are specified by statute. *See McMahan & Co. v. Warehouse Entm’t, Inc.*, 65 F.3d 1044, 1048 (2d Cir. 1995) (“The plain language of section 11(e) prescribes the method of calculating damages . . . and the court must apply that method in every case.”); 15 U.S.C. § 77k(e) (Section 11 damages); *Fed. Housing Fin. Agency v. Nomura Holding Am. Inc.*, 68 F. Supp. 3d 486, 496 (S.D.N.Y. 2014) (“Section 12(a)(2) has a different measure of damages than Section 11’s.”); 15 U.S.C. § 77l(a) (Section 12(a)(2) damages). Thus, the proposed Class’s Securities Act claims satisfy Rule 23(b)(3)’s predominance requirement.

The Defendants also do not oppose class certification regarding the state common law claims. Indeed, common questions of law and fact predominate over individual questions with respect to the Class’s state common law claims. First, the parties have stipulated that “Pennsylvania substantive law governs the” state common law claims under Connecticut’s choice of law rules because “Teva’s U.S. subsidiary has its principal place of business in Pennsylvania, and much of the alleged relevant conduct occurred in Pennsylvania.” Joint Stip., Doc. No. 706, at 2. Second, I have already commented that “it is undeniable that essentially the same facts undergird [the state common law] claims and the federal securities law claims in this action.” *Ontario Teachers’ Consolidation Ruling*, 2020 WL 1181366, at *13. For those reasons, common questions of both law and fact predominate over individual ones with respect to the proposed Class’s state common law claims.

C. Rule 23(b)(3) Predominance: Exchange Act Claims – Reliance

With respect to the Exchange Act, the parties vigorously disagree regarding whether the Plaintiffs have established reliance, which is necessary to holding that common questions of fact or law predominate, and whether the Plaintiffs have established that classwide damages can be calculated consistent with their theories of liability, as required by *Comcast Corp. v. Behrend*, 569 U.S. 27 (2013). Here, I address reliance and the Defendants’ associated *Daubert* challenge.

The Plaintiffs argue that reliance will be a classwide issue either because (1) they are entitled to the *Basic* presumption, or, in the alternative, (2) they are entitled to a different presumption of reliance under *Affiliated Ute Citizens of Utah v. United States*, 406 U.S. 128 (1972). I need not address the Plaintiffs’ *Affiliated Ute* argument because I hold that the Plaintiffs are entitled to the *Basic* presumption, which the Defendants fail to rebut.

To invoke the *Basic* presumption, the Plaintiffs must show that (1) the Defendants’ statements were public, (2) the Defendants’ securities traded in efficient markets, and (3) the Plaintiffs purchased the shares at the market price after the misstatements were made but before corrective disclosures revealed the truth. *See ARTS II*, 955 F.3d at 260. There is no dispute regarding (1) and (3): The Defendants’ statements were public—they were filed with the SEC and made in press releases and on conference calls—and the Plaintiffs purchased the Teva Securities throughout 2014, 2015, and 2016 (the first alleged corrective disclosure was in August 2016). *See App. D to SAC, Doc. No. 310*. The major dispute regards (2): Whether the Plaintiffs have established that the Teva Securities traded in efficient markets. The parties’ disagreements can be technical and specific, and several critiques may have some theoretical merit but still be unimportant to my overall determination. In part for that reason, I agree with a

recent court in the Southern District of New York that wrote: “In assessing market efficiency, courts should not let the perfect become the enemy of the good.” *Petrobras I*, 312 F.R.D. at 371.

The Plaintiffs claim that all the *Cammer* and *Kroger* factors weigh in their favor with respect to all of the Teva Securities. The Defendants make various challenges, almost exclusively to *Cammer* 5. In my view, the Plaintiffs have established that the markets for all the Teva Securities were efficient. That conclusion is clearest for the ADS, which traded on the NYSE, and least clear for the Notes, which traded over the counter and are also, by their nature, liable to be less responsive to “material” news about Teva. Still, I do not view any of the three analyses as a close question. I will first address all the “indirect” factors by type of security.

1. “Indirect” Indicia of Market Efficiency

a. ADS

For the ADS, it is uncontested that all seven “indirect” *Cammer* and *Krogman* factors suggest market efficiency.

Cammer 1: The ADS had an average weekly trading volume throughout the Class Period of 4.87 percent. *See* Ex. 3-a to Tabak Report, Doc. No. 419-5, at 121. That is well above the two percent threshold that courts hold supports a “strong presumption” in favor of market efficiency. *See Cammer*, 711 F. Supp. at 1286; *Menaldi*, 328 F.R.D. at 95 (holding that average weekly trading volume of 3.2 percent of outstanding shares helped point towards market efficiency).

Cammer 2: An average of 20 analysts each month provided quarterly earnings estimates regarding the ADS to the Institutional Brokers’ Estimate System. *See* Ex. 4 to Tabak Report, Doc. No. 419-5, at 130–31. Over 2,000 analyst reports were available regarding Teva during the Class Period, including reports from “firms including Barclays, Citi, Credit Suisse, Deutsche

Bank, J.P. Morgan, Morgan Stanley, UBS, and Wells Fargo.” Tabak Report at ¶ 25. Other courts have found analyst attention less significant than that described in the Tabak Report to weigh in favor of market efficiency. *See, e.g., Winstar*, 290 F.R.D. at 446 (holding that factor weighed in favor of market efficiency when “at least three analysts” reported on company’s bonds during the class period, and “numerous analysts” followed the company’s stock); *Villella*, 333 F.R.D. at 54 (15 firms followed the defendant); *Menaldi*, 328 F.R.D. at 95 (400 analyst reports in a two-and-a-half-year class period).

Cammer 3: The ADS traded on the NYSE, which “maintains a system where there is a ‘designated market maker’ . . . in charge of ensuring that there is a well-functioning market.” Tabak Report at ¶ 26. In addition, the ADS also traded on the NASDAQ Exchange, “where 238 market makers traded the” ADS. *See id.* Over 900 institutions held ADS at the beginning of the Class Period, and, over the Class Period, “[i]nstitutional holdings varied from 61.0 percent to 76.0 percent of shares outstanding.” Tabak Report at ¶ 31; Ex. 5a to Tabak Report, Doc. No. 419-5, at 132–33. The number of arbitrageurs holding short positions in the ADS over the Class Period varied substantially month-to-month; that observation “supports the conclusion that investors were able to, and did, take and change positions in Teva’s ADS[] to reflect their views, the core mechanism by which financial markets are driven to efficiency.” Tabak Report at ¶¶ 30–31; Ex. 6-a to Tabak Report, Doc. No. 419-5, at 135–38. The market makers and arbitrage opportunities for the ADS weigh heavily in favor of market efficiency. *See In re Initial Pub. Offering Sec. Litig.*, 260 F.R.D. 81, 100 (S.D.N.Y. 2009) (holding that stocks traded on the NYSE “satisfy this factor”); *Cammer*, 711 F. Supp. at 1293 (indicating that a number of market makers above ten would “justify a substantial presumption” of market efficiency) (cleaned up); *Wilson*, 2018 WL 3913115, at *10 (collecting cases).

Cammer 4: Teva was at all times during the Class Period eligible to file either a Form F-3 or a Form S-3. Teva filed Forms F-3 until it became a domestic issuer at the beginning of 2018, when it started filing Forms S-3. *See* Tabak Report at ¶¶ 34–36

Krogman 1: Teva’s market capitalization throughout the Class Period bottomed out above \$9 billion and maxed out above \$52 billion. *See* Tabak Report at ¶ 54; Ex. 7-a to Tabak Report, Doc. No. 419-5, at 139–60. At the end of the Class Period, Teva’s market capitalization was about \$14 billion, which at that time “exceeded the market capitalization of more than 85% of the members of the Russell 3000 Index.” Tabak Report at ¶ 54. Courts have found lower market capitalizations to support a finding of market efficiency. *See, e.g., Carpenters Pension Tr. Fund of St. Louis v. Barclays PLC*, 310 F.R.D. 69, 92 (S.D.N.Y. 2015) (market capitalization between \$0.5 and \$3.2 billion supported market efficiency).

Krogman 2: During the Class Period, the bid-ask spread of the ADS averaged 0.035 percent of the same day’s closing price, which typically corresponded to \$0.01. *See* Tabak Report at ¶¶ 57–58; Ex. 9-a to Tabak Report, Doc. No. 419-5, at 193–224. Courts routinely hold that average bid-ask spreads well above that support market efficiency. *See Petrie v. Elec. Game Card, Inc.*, 308 F.R.D. 336, 356 (C.D. Cal. 2015) (citing cases).

Krogman 3: The average “float” of the ADS during the Class Period was over 98.5 percent of the ADS outstanding. *See* Tabak Report at ¶ 61; Ex. 7-a to Tabak Report, Doc. No. 419-5, at 139–60. That is far higher than other courts have held sufficient to support a finding of market efficiency. *See Wilson*, 2018 WL 3913115, at *15 (82.41 percent); *McIntire*, 38 F. Supp. 3d at 433 (under 50 percent).

NYSE: In addition to the seven indirect factors, the ADS traded on the NYSE, which courts have described as a “paradigmatic efficient market.” *Pirnik v. Fiat Chrysler Autos., N.V.*,

327 F.R.D. 38, 44 (S.D.N.Y. 2018) (cleaned up); *see also In re DVI, Inc. Sec. Litig.*, 639 F.3d 623, 634 (3d Cir. 2011), *abrogated on other grounds by Amgen*, 568 U.S. at 465 (“Securities markets like the NYSE and the NASDAQ are open and developed and are therefore well suited for application of the fraud on the market theory.”) (cleaned up). That factor also weighs in favor of market efficiency.

Autocorrelation: The evidence regarding autocorrelation is disputed. Dr. David I. Tabak, the Plaintiffs’ expert, ran two different autocorrelation tests. The first tested for “first-degree, or one-day, autocorrelation.” Tabak Report at ¶ 65; *see also* Ex. 10a-a to Tabak Report, Doc. No. 419-5, at 245. That test demonstrated a statistically significant¹⁹ degree of autocorrelation for the ADS over the Class Period. *See id.* Dr. Tabak also tested each year (and partial year) within the Class Period and found that three years showed positive autocorrelation and three years showed negative autocorrelation, with only one year’s result being statistically significant. *See id.* Dr. Tabak noted that because the directions of the yearly autocorrelation were contradictory, the autocorrelation “should not be profitable, because investors cannot count on any historically observed autocorrelation that they can measure to persist when they are attempting to exploit it.” *Id.* Dr. Tabak concluded that this finding was “mixed” and did “not point strongly to either market efficiency or inefficiency.” *Id.*

Dr. Tabak performed a second autocorrelation test: the “runs” test. *Id.* at ¶ 66; *see also* Ex. 10b-a to Tabak Report, Doc. No. 419-5, at 249. The “runs” test relies on probability theory to test autocorrelation. In the “runs” test, Dr. Tabak found no statistically significant autocorrelation for the ADS either over the Class Period or during any year (or partial year). *See*

¹⁹ Throughout this ruling, when I say “statistically significant,” I mean “statistically significant at the five percent level,” unless I note otherwise. The five-percent level is the “standard” level of statistical significance in financial economics. *See* Tabak Report at ¶ 45. A result is statistically significant at the five-percent level if “there is only a five percent chance that a result as strong as or stronger than the one observed in the data would appear” by chance. *Id.*

id. In Dr. Tabak’s view, that result “point[s] very strongly toward a lack of autocorrelation, which weighs in favor of a finding of efficiency.” Tabak Report at ¶ 68.

The Defendants argue that the first-degree autocorrelation test results indicate that the market for the ADS could not have been efficient. *See* Defs.’ Class Cert. Opp’n, Doc. No. 508, at 29 (arguing that that result “fatally undermine[s]” Dr. Tabak’s conclusion of market efficiency). That is because, as the Defendants’ experts point out, if a security displays statistically significantly autocorrelation, then the market for that security is not even weak-form efficient. *See, e.g.*, Expert Report of Mukesh Bajaj, Doc. No. 508-3, at ¶¶ 37–45 (the “Bajaj Report”); Expert Report of John J. McConnell, Doc. No. 508-2, at ¶¶ 60–64 (the “McConnell Report”); *supra* n.15 (explaining the three forms of market efficiency). As Dr. Tabak acknowledges, a market that is not weak-form efficient by definition cannot be semi-strong-form efficient because weak-form efficiency is a subset of semi-strong-form efficiency. *See* Tabak Depo. Tr., Ex. 6 to Defs.’ Class Cert. Opp’n, Doc. No. 507, at 33:5–9. The Defendants’ experts also argue that Dr. Tabak is wrong to interpret his findings based on “whether an investor could earn a profit by trading on the basis of information reflected in the historical prices of Teva securities” because doing so is “pure speculation” that has no support in the “scholarly literature.” McConnell Report at ¶¶ 63–64.

In rebuttal, Dr. Tabak reiterates that the “real question is whether the observed autocorrelation is exploitable, meaning that an investor could earn trading profits as a result.” Rebuttal Expert Report of David I. Tabak, Doc. No. 656-10, at ¶ 171 (the “Tabak Rebuttal Report”). “Autocorrelation that appears and disappears, or changes direction . . . is generally not exploitable because once one determines the proper trading strategy, that strategy may no longer

be profitable.” *Id.* Dr. Tabak notes that in an expert report in a different case, Dr. Bajaj agreed with that analysis. *See id.* at ¶ 172.

Accepting the Defendants’ argument would require me to cast aside common sense. Importantly, “the presence of serial correlation is not itself determinative of inefficiency.” *In re Countrywide Fin. Corp. Sec. Litig.*, 273 F.R.D. 586, 615 (C.D. Cal. 2009). In this case, all the “indirect” factors I have already considered above weigh heavily in favor of market efficiency for the ADS. In any event, I find Dr. Tabak’s reasoning persuasive. What is important is whether the ADS traded in a generally efficient market, and limited, unpredictable autocorrelation is simply not indicative of market inefficiency under these circumstances. *See Cosby v. KPMG, LLP*, 2020 WL 3548379, at *22 (E.D. Tenn. June 29, 2020) (agreeing with expert that “there was no consistent pattern that would suggest an arbitrage opportunity because the sign of the autocorrelation coefficient is not even consistently the same”); *In re Comput. Scis. Corp. Sec. Litig.*, 288 F.R.D. 112, 121 & n.9 (E.D. Va. 2012) (agreeing that an important consideration was whether “the serial correlations could have been used to generate trading profits”). Dr. Tabak’s autocorrelation tests thus yield evidence that weighs neither in favor of nor against market efficiency for the ADS.

In sum, all seven “indirect” *Cammer* and *Krogman* factors—and the fact that the ADS traded on the NYSE—point towards the conclusion that the market for the ADS was efficient. Pursuant to Second Circuit precedent, *Cammer* 5 has limited relevance in this situation. *See Waggoner*, 875 F.3d at 97–98. Nevertheless, below I examine *Cammer* 5 for the ADS, and it, too, strongly supports market efficiency.

b. Preferred Shares

In several ways, the Preferred Shares closely resemble the ADS. After all, each Preferred Share simply represented a certain number of ADS. *See supra* nn. 7, 17. However, the Preferred Shares traded over the counter, not on a national stock exchange. Several of the “indirect” *Cammer* and *Krogman* factors are undisputed and weigh in favor of market efficiency, but the Defendants contest a few.

Cammer 1: The average weekly trading volume of the Preferred Shares during their existence (Dec. 3, 2015 to Dec. 17, 2018) was 4.96 percent. *See* Tabak Report at ¶ 20; Ex. 3-b to Tabak Report, Doc. No. 419-5, at 126. Again, that easily clears the bar justifying a “strong presumption” of market efficiency.

Cammer 2: The Defendants argue that Dr. Tabak “offers no evidence that analyst reports were written specifically covering the Preferred Shares.” Defs.’ Class Cert. Opp’n, Doc. No. 508, at 30; *see also* Bajaj Report at ¶ 122. The Plaintiffs reply that there is “no requirement to have analysts ‘specifically covering’ the Preferred Shares.” Pls.’ Class Cert. Reply, Doc. No. 656, at 15. In my view, the substantial analyst coverage of the ADS is highly relevant to the Preferred Shares because the Preferred Shares represented a certain number of ADS. Thus, this factor supports a finding of market efficiency.

Cammer 3: The amount of outstanding Preferred Shares held by institutional investors was, on average, 42.48 percent, which is lower than the amount of outstanding ADS that were held by institutional investors, on average, during the Class Period (64.3 percent). *See* Tabak Report at ¶ 32; Ex. 5-b to Tabak Report, Doc. No. 419-5, at 134. Several courts have held that percentages lower than or similar to 42.48 percent support a finding of market efficiency. *See Tatz v. Nanophase Techs. Corp.*, 2003 WL 21372471, at *7 (N.D. Ill. June 13, 2003) (institutional holdings ranged from 11 to 13 percent during relevant period); *Lumen v. Anderson*,

280 F.R.D. 451, 460 (W.D. Mo. 2012) (institutional holdings ranged from 29 to 71 percent during relevant period).

But many courts appear to give significant weight only to higher percentages. *See Petrie*, 308 F.R.D. at 357 (not weighing average of 24.2 percent in plaintiffs’ favor and noting that many cases in which courts do give weight to this factor “involve[] companies with average institutional holdings of over 70%”). The fact that institutional investors’ holdings of Preferred Shares varied significantly (between 19 and 62 percent, *see* Ex. 5-b to Tabak Report, Doc. No. 419-5, at 134) weighs in the Plaintiffs’ favor because it indicates “that institutions were able to and did change their holdings . . . based on new information.” Tabak Report at ¶ 32.

As the Defendants point out (and as Dr. Tabak admits), the Plaintiffs do not provide any short position data or market makers evidence regarding the Preferred Shares (which traded over the counter) because that data is not available. *See* Defs.’ Class Cert. Opp’n, Doc. No. 508, at 30–31; Bajaj Report at ¶ 124. Dr. Tabak argues that the data on institutional investors’ taking (and changing) “long” positions in Preferred Shares over the Class Period is strong evidence of market efficiency. *See* Tabak Rebuttal Report at ¶¶ 15–16.

Because of the limited amount of information available to evaluate *Cammer* 3 for the Preferred Shares, and because of the relatively insubstantial probity of that information, this factor weighs only slightly in favor of market efficiency.

Cammer 4: As noted above, Teva was able to file either a Form F-3 or S-3 for the entirety of the Class Period, so this factor weighs in favor of market efficiency. Furthermore, it is worth noting that the market value of the Preferred Shares itself would have easily satisfied the Form S-3’s market capitalization requirement for common stock float (\$75 million). *See* Tabak

Report at ¶ 36; Ex. 7-b to Tabak Report, Doc. No. 419-5, at 161–74 (nearly always over \$1 billion).

Krogman factors: The market capitalization of the Preferred Shares was always over \$880 million, nearly always over \$1 billion, and for long periods of time nearly \$4 billion. *See* Tabak Report at ¶ 56; Ex. 7-b to Tabak Report, Doc. 419-5, at 161–74. The float of the Preferred Shares averaged 100 percent. *See* Tabak Report at ¶ 62; Ex. 7-b to Tabak Report, Doc. No. 419-5, at 161–74. Thus, the Preferred Shares’ average market capitalization and float clearly weigh in favor of market efficiency.

The average daily bid-ask spread of the Preferred Shares was 2.66 percent of their closing price. *See* Tabak Report at ¶ 59; Ex. 9-b to Tabak Report, Doc. No. 419-5, at 225–43. The Defendants argue that that spread does not support market efficiency. *See* Defs.’ Class Cert. Opp’n, Doc. No. 508, at 31; Bajaj Report at ¶ 126. Indeed, the Preferred Shares’ average daily bid-ask spread is higher than many other courts have held weighs in favor of market efficiency. *See, e.g., Rougier v. Applied Optoelectronics, Inc.*, 2019 WL 6111303, at *13 (S.D. Tex. Nov. 13, 2019) (holding that average daily bid-ask spread of 0.04 percent supported market efficiency and reporting that, as of late 2017, “[t]he average bid-ask spread for all of the companies on the NYSE and NASDAQ was 0.59%”). However, several courts have held that average daily bid-ask spreads near 2.66 percent support a finding of market efficiency. *See, e.g., Petrie*, 308 F.R.D. at 356 (holding that average bid-ask spread of 2.91 percent “supports Plaintiffs’ case . . . but not strongly”); *Cheney v. Cyberguard Corp.*, 213 F.R.D. 484, 501 (S.D. Fla. 2003) (holding that average daily bid-ask spread of 2.44 percent “weighs in favor of market efficiency”). Further, Dr. Tabak explains that a 2.66 percent average daily bid-ask spread would not have erased the incentive for arbitrageurs to take short positions in Preferred Shares, given the

magnitude of the alleged equity price inflation in this case. *See* Tabak Rebuttal Report at ¶ 22. In my view, the Preferred Shares' average bid-ask spread weighs moderately in favor of market efficiency.

Over the counter: The Preferred Shares (and the Notes) traded over the counter, which the Defendants argue weighs against a finding of market efficiency. *See* Defs.' Class Cert. Opp'n, Doc. No. 508, at 31; Bajaj Report at ¶ 125. Although a security's trading over the counter does not confer a presumption of market efficiency in the way that a security's trading on the NYSE does, it also does not indicate that the market for the security was inefficient. *See Petrie*, 308 F.R.D. at 349 ("Most courts have held that where a stock is traded—in an over-the-counter market, like [the Defendant's] stock was, versus on a national exchange—is not dispositive as to whether the market for that stock is efficient.") (citing *Krogman*, 202 F.R.D. at 474; *Cammer*, 711 F. Supp. at 1280–84). After considering other indicia of market efficiency, many courts have held that stocks and bonds that traded over the counter were traded in efficient markets. *See, e.g., id.* at 358 (over the counter equity traded in efficient market); *In re Parmalat Sec. Litig.*, 2008 WL 3895539, at *9–10 (equity); *Cammer*, 711 F. Supp. at 1280–83 (equity); *In re DVI, Inc. Sec. Litig.*, 249 F.R.D. 196, 214–16 (E.D. Pa. 2008), *aff'd* 639 F.3d 623 (3d Cir. 2011), *abrogated on other grounds by Amgen*, 568 U.S. at 465 (bonds); *In re HealthSouth Corp. Sec. Litig.*, 261 F.R.D. 616, 633–38 (N.D. Ala. 2009) (bonds). On its own, the fact that the Preferred Shares traded over the counter does not weigh one way or the other.

Autocorrelation: The debate over autocorrelation is similar here as it was for the ADS. Dr. Tabak's "first-degree" autocorrelation test suggests that the Preferred Shares exhibited no statistically significant autocorrelation over the entire Class Period but did exhibit statistically significant autocorrelation in three of the four relevant years and partial years. *See* Tabak Report

at ¶ 69; Ex. 10a-b to Tabak Report, Doc. No. 419-5, at 246. The signs of the autocorrelation results are inconsistent: The autocorrelation over the entire Class Period and during one year of the Class Period was positive, but the autocorrelation in two years of the Class Period was negative. *See id.* Similarly, Dr. Tabak’s “runs” test indicated that the Preferred Shares did not exhibit statistically significant autocorrelation over the entirety of the Class Period, but did in one partial year. *See* Tabak Report at ¶ 69; Ex. 10b-b to Tabak Report, Doc. No. 419-5, at 250. Again, the sign of the autocorrelation changed from year to year (it was positive in three years and negative in one year). *See id.* Dr. Tabak concludes that “there is no stable autocorrelation in the prices of the Preferred Shares.” Tabak Report at ¶ 69. The Defendants again argue that those results prove that the market for the Preferred Shares “was not even weak form efficient” during the periods where they exhibited statistically significant autocorrelation. *See* Bajaj Report at ¶¶ 39–40. I have already explained why, in my view, only evidence of consistent (*i.e.*, predictable) autocorrelation would weigh against market efficiency. Thus, for the reasons I have already articulated, the autocorrelation tests do not weigh either in favor of or against market efficiency.

Although it is less clear-cut than for the ADS, in my view, examination of the “indirect” *Cammer* and *Krogman* factors strongly indicates that the market for Preferred Shares was efficient. *Cammer* 1, 2 and 4 and *Krogman* 1 and 3 weigh strongly in Plaintiffs’ favor. *Cammer* 3 and *Krogman* 2 weigh slightly in Plaintiffs’ favor. Taken together, that is strong evidence of market efficiency, and *Cammer* 5 has limited importance in this situation as well.

c. Notes

In assessing market efficiency for debt securities—rather than equity securities—courts must be mindful of the differences between the two. *See In re Enron Corp. Sec.*, 529 F. Supp. 2d 644, 755 (S.D. Tex. 2006) (“[A] comparison between equity and bond markets is a comparison

between the proverbial apple and orange.”). Bonds are senior to equity and so, “in the event of a liquidation, the Notes have higher payment priority.” Tabak Report at ¶ 51. Thus, the prices of debt securities “are less likely to be affected by news that does not have as large of an impact on Teva.” *Id.* Numerous courts evaluating the efficiency of debt markets have noted that distinction. *See, e.g., In re Enron*, 529 F. Supp. 2d at 749 (“[F]actors affecting debt securities must [] be examined analytically, not cursorily or superficially, with a view to their distinctive nature and to the kinds of news that would move their market price in contrast to the kind of information that might affect the more volatile stock market, as well as the manner in which that movement would occur.”); *In re Countrywide*, 273 F.R.D. at 615 (explaining that debt prices are unlikely to be affected by negative news “[u]ntil the financial situation becomes severe enough that the issuer is likely to default,” and are unlikely to be affected much by positive news because, although “equity takes [] additional profit, [] debt’s upside is limited by the debt’s terms”); Jonathan R. Macey & Geoffrey P. Miller, *Good Finance, Bad Economics: An Analysis of the Fraud-on-the-Market Theory*, 42 STANFORD L. REV. 1059, 1085 (April 1990) (“[I]t seems clear that not all corporate information will affect all securities of a given issuer in the same way. Debt securities will be more insulated from the shocks associated with bad news than will equity securities.”).

As a result, courts still apply the *Cammer* factors in evaluating market efficiency for debt securities but are conscious that a more holistic analysis is often necessary. *See, e.g., Petrobras I*, 312 F.R.D. at 366 (“Although the *Cammer* factors were not designed for debt securities . . . they are still useful in evaluating the efficiency of a debt securities market, particularly in conjunction with an analysis of the equities markets for the same company.”); *Winstar*, 290 F.R.D. at 446, 449 (noting that “courts adjust [the *Cammer* factors] for the realities of the over

the counter bond market” and that “[t]he *Cammer* factors, especially in the context of the bond market, are merely an analytical guide and are not exhaustive”).

Given all that, I will examine the “indirect” *Cammer* and *Krogman* factors for the Notes.

Cammer 1: The following table shows the Notes’ average weekly trading volume as a percentage of the total outstanding Notes issued, broken down by Note.

Note	Avg. Traded Weekly
2018 Notes	1.46%
2019 Notes	1.31%
2021 Notes	2.07%
2023 Notes	2.49%
2026 Notes	4.21%
2046 Notes	3.98%

See Ex. 3-c to Tabak Report, Doc. No. 419-5, at 128. Thus, four of the six Notes—those with average weekly trading volumes over two percent—are entitled to a “strong” presumption in favor of market efficiency. The other two Notes—those with average weekly trading volumes between one and two percent—are entitled to a “substantial” presumption. See *Cammer*, 711 F. Supp. at 1286; *Petrobras I*, 312 F.R.D. at 366–67 (applying *Cammer*’s test and noting that the results weighed especially strongly in favor of market efficiency because “the *Cammer* thresholds are designed for common stock, which trades more frequently than bonds”); *In re DVI, Inc. Sec. Litig.*, 249 F.R.D. at 214–15 (noting the same). This factor weighs heavily in favor of market efficiency for the Notes.

Cammer 2: The Plaintiffs point out that major credit rating agencies—Moody’s, Standard & Poor’s, and Fitch—“provided, and changed, ratings of Teva’s debt.” Tabak Report at ¶ 24. Several courts have looked to credit rating agencies’ coverage in examining whether the market for a debt security was efficient. See, e.g., *In re Countrywide*, 273 F.R.D. at 615 (“Coverage by the major credit rating agencies also provides information to the market and is

relevant to a determination of a debt security's efficiency."); *Petrobras I*, 312 F.R.D. at 366. Just as in response to the Preferred Shares, the Defendants argue that the Plaintiffs have not identified any analyst coverage of the Notes in particular. *See* Defs.' Class Cert. Opp'n, Doc. No. 508, at 30; Bajaj Report at ¶ 122.

Coverage by credit rating agencies, on its own, has limited probative value with respect to the market efficiency for a debt security. *See In re Countrywide*, 273 F.R.D. at 615 ("The rating agencies' reports appear to provide less nuanced information than analysts' reports, appear to issue less often than analysts' reports, and may lag behind the market's knowledge."); *see also Teamsters Local 445*, 546 F.3d at 206 n.12 ("[T]here are reasons why a district court may conclude that rating agencies less directly impact the price of bonds in comparison to analysts who follow an equity, directly relate information to buyers, and engage in the act of selling."); *Winstar*, 290 F.R.D. at 446 n.10.

Still, in my view, this *Cammer* factor weighs substantially in favor of market efficiency for the Notes. First, the Plaintiffs point out in rebuttal that there were at least some analyst reports that focused exclusively on the Notes. *See* Exs. B and C to Pls.' Class Cert. Reply, Doc. Nos. 656-2 and -3 (Deutsche Bank analyst reports from Jan. 31 and Feb. 8, 2018, respectively). Second, numerous courts recognize that substantial analyst coverage of a company's equity (and of the company more generally) is also somewhat probative of whether the market for that company's debt securities was efficient. *See, e.g., Petrobras I*, 312 F.R.D. at 366 (considering analyst coverage of Petrobras's securities in the debt securities market efficiency analysis); *Winstar*, 290 F.R.D. at 446 (noting that "[a]lthough courts tend to look at the number of analysts following a given security (as opposed to the company as a whole), . . . the number of analysts following the company as a whole is instructive" in evaluating bond market efficiency because

“[t]he company’s overall financial health impacted the price of both Winstar’s stock and bonds”); *In re HealthSouth*, 261 F.R.D. at 635; Michael Hartzmark, Cindy A. Schipani, & H. Nejat Seyhun, *Fraud on the Market: Analysis of the Efficiency of the Corporate Bond Market*, 2011 COLUM. BUS. L. REV. 654, 697 (explaining why “both equity and credit reports provide important and useful information” to bondholders). I have already explained why the substantial coverage of Teva’s equity contributes to a finding of market efficiency for the ADS and Preferred Shares. In sum, this factor weighs substantially in favor of market efficiency.

Cammer 3: As with the Preferred Shares, the Defendants argue that the Plaintiffs do not provide any short position data or market makers evidence regarding the Notes (which traded over the counter) because that data is not available. *See* Defs.’ Class Cert. Opp’n, Doc. No. 508, at 30–31; Bajaj Report at ¶ 124. However, the Plaintiffs explain that the Notes offering in July 2016 was underwritten by 18 investment banks. *See* Tabak Report at ¶ 33. Further, during the Notes offering, each Note was allocated to at least 100 institutional investors. *See id.* Dr. Tabak concludes that this factor “provides no information either in support of or against a finding of market efficiency for the Teva Notes.” *Id.* But courts regularly hold that that level of underwriter involvement in a notes offering can help weigh in favor of market efficiency. *See Petrobras I*, 312 F.R.D. at 366 (noting that “there were at least 20 underwriters of the Petrobras Bonds, including large and prominent investment banks”); *In re Enron*, 529 F. Supp. 2d at 770 (commenting that “the direct involvement of an impartial, reputable underwriter” in a bond’s initial public offering is an indication of an efficient market) (quoting Robert G. Newkirk, Comment, *Sufficient Efficiency: Fraud on the Market In the Initial Public Offering Context*, 58 U. CHI. L. REV. 1393, 1414 (Fall 1991)). I hold that this factor weighs slightly in favor of market efficiency.

Cammer 4: This analysis is the same as above and clearly weighs in favor of market efficiency. Similarly, just as with the Preferred Shares, the market value of each Note itself would have easily satisfied Form S-3's market capitalization requirement for common stock float (\$75 million). See Tabak Report at ¶ 36; Ex. 7-c2 to Tabak Report, Doc. No. 419-5, at 176 (lowest market capitalization was nearly \$1.5 billion).

Krogman factors: The Notes' average market capitalization over the Class Period (or until maturity in the case of the 2018 Notes) ranged from nearly \$1.5 billion to over \$3 billion. See Ex. 7-c2 to Tabak Report, Doc. No. 419-5, at 176. The average daily bid-ask spread for the Notes ranged from 0.18 to 0.45 percent. See Ex. 9-c to Tabak Report, Doc. No. 419-5, at 244. Because of a lack of available evidence, it was not possible to calculate the "float" for the Notes. See Tabak Report at ¶ 63. Thus, the first two *Krogman* factors weigh substantially in favor of market efficiency, and *Krogman 3* is not applicable.

Autocorrelation: In the "first-degree" autocorrelation test, four of the six Notes displayed statistically significant autocorrelation over the Class Period (or until maturity). See Tabak Report at ¶ 70; Ex. 10a-c to Tabak Report, Doc. No. 419-5, at 247–48. All four of those Notes, though, displayed statistically significant autocorrelation in, at most, just a single year of the Class Period. See *id.* In the "runs" test, two of the six Notes displayed statistically significant autocorrelation over the Class Period. See Tabak Report at ¶ 70; Ex. 10b-c to Tabak Report, Doc. No. 419-5, at 251–53. Those two Notes displayed statistically significant autocorrelation in both tests.

Dr. Tabak concluded that there was "minimal evidence of autocorrelation" for the 2019 and 2026 Notes (which did not display statistically significant autocorrelation over the entire Class Period in either test), "mixed to weak evidence" of autocorrelation for the 2021 and 2023

Notes (which displayed statistically significant autocorrelation over the Class Period in the “first-degree” test), and “moderate evidence” of autocorrelation for the 2018 and 2046 Notes (which displayed autocorrelation in both tests). *See* Tabak Report at ¶ 70. In Dr. Tabak’s view, the results of those tests “do not provide strong evidence in any direction.” *Id.*

As described above, the Defendants view that evidence of autocorrelation as proof that the Notes did not trade even in a weak-form efficient market and so could not possibly have traded in a semi-strong-form efficient market. I have already explained why I disagree with that view. However, I acknowledge that the evidence of autocorrelation for the Notes appears much stronger than for the ADS or the Preferred Shares. That evidence, though, does not detract much (if at all) from a finding of market efficiency because the bond market in general exhibited autocorrelation over the Class Period. Dr. Tabak performed “first-degree” and “runs” autocorrelation tests on the Dow Jones Corporate Bond Total Return Index, which is a proxy for the corporate bond market. According to both tests, the Index exhibited statistically significant autocorrelation over the Class Period as a whole, and during at least one year in particular. *See* Tabak Rebuttal Report at ¶ 176; Exs. 9a, 9b to Tabak Rebuttal Report, Doc. No. 656-10, at 211–12. Other courts have discounted evidence of autocorrelation in debt securities when the benchmark bond index itself exhibited statistically significant autocorrelation during the same period. *See Bennett v. Sprint Nextel Corp.*, 298 F.R.D. 498, 513 (D. Kan. 2014). For the same reason, I do not view the evidence of autocorrelation for the Notes as detracting from a finding of market efficiency.

In sum, *Cammer* 1, 2, and 4 and *Krogman* 1 and 2 weigh heavily in favor of market efficiency for the Notes. *Cammer* 3 weighs slightly in favor, and *Krogman* 3 is inapplicable. The relatively strong evidence of statistically significant autocorrelation in the Notes is

neutralized by the fact that the relevant bond index also showed statistically significant autocorrelation during the Class Period and several years in particular. Again, that is strong evidence of market efficiency, and *Cammer* 5 takes on limited importance.

2. “Direct” Evidence of Market Efficiency: *Cammer* 5

Establishing direct, cause-and-effect evidence in favor of market efficiency can be very difficult, and there are several ways of attempting to do so. As described above, Plaintiffs often rely on “event studies,” which are “regression analyses that seek to show that the market price of the defendant’s [securities] tends to respond to pertinent publicly reported events.” *Halliburton II*, 573 U.S. at 280. Single-firm event studies, though, can suffer from significant limitations. *See Petrobras II*, 862 F.3d at 278 (“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.”) (citing Alon Brav & J.B. Heaton, *Event Studies in Securities Litigation: Low Power, Confounding Effects, and Bias*, 93 WASH. U. L. REV. 583 (2015)). More particularly, the Second Circuit has noted the following potential shortcomings:

[S]mall sample sizes may limit statistical power, meaning that only very large-impact events will be detectable. In addition, it can be extremely difficult to isolate the price impact of any one piece of information in the presence of confounding factors, such as other simultaneously released news about the company, the industry, or the geographic region.

Id. at 278–79 (cleaned up). Perhaps for those reasons, it appears that single-firm event studies appear in litigation far more frequently than in financial economic literature. *See* Brav & Heaton, *Event Studies*, at 587 (“These problems help explain why the [single-firm event study] methodology is applied so infrequently in peer-reviewed research. But the same problems have not limited the use of the [single-firm event study] in securities litigation.”).

Not all event studies are the same. One way to conduct an event study is through “proof by example.” In a “proof by example” event study, a plaintiff’s expert might identify some number of days that contained both material news and a concomitant price increase (or decrease) and argue a cause-and-effect relationship. *See* David Tabak, *Use and Misuse of Event Studies to Examine Market Efficiency*, NERA CONSULTING (Apr. 30, 2010) (“Tabak 2010 Article”), Ex. 5 to Defs.’ Class Cert. Opp’n, Doc. No. 508-6, at 3; Tabak Rebuttal Report at ¶¶ 26–28.

According to some courts and commentators, such event studies are not always particularly helpful. *See In re PolyMedica*, 453 F. Supp. 2d at 270 (rejecting such an event study because the “mere listing of five days on which news was released and which exhibited large price fluctuations proves nothing”); Tabak 2010 Article, Doc. No. 508-6, at 3 (noting that proof-by-example event studies do not “prov[e] any reliable correlation between” material news and price movements because such studies are non-comparative).

Another way to conduct an event study is not to choose a few event dates, but, instead, to sort *all* the trading days of a class period into news and non-news days,²⁰ determine the proportion of each set of days associated with a statistically significant excess price return, and then compare those results to see if the difference itself is statistically significant.²¹ “If the news days are more likely to be associated with a statistically significant return, this would be evidence in favor of market efficiency.” Tabak 2010 Article, Doc. No. 508-6, at 8; *see also In re Polymedica*, 453 F. Supp. 2d at 270 (“To approach usefulness, an analysis should statistically compare all news days with all non-news days.”).

²⁰ The news set is analogous to a treatment group in a medical study, and the non-news set is analogous to a control group. *See* Tabak Report at ¶¶ 38–39, 44 (explaining that, in this case, the control group “used the S&P Pharmaceuticals Select Industry Index as a proxy for the relevant market and industry effects”).

²¹ The comparison generates a “z-statistic,” which is a “test statistic for a two-sample test of binomial proportions” that “measures the probability of obtaining results as or more extreme as those observed if the returns for news and non-news days were drawn from the same distribution.” Ex. 8a-a to Tabak Report, Doc. No. 419-5, at 177 n.2. “The further the z-statistic is from zero, the less likely that the observed difference could have been seen if the returns for news and non-news days were drawn from the same distribution.” *Id.*

The Plaintiffs' expert in this case—Dr. Tabak—was one of the pioneers of this method of event study. In 2004, Dr. Tabak co-authored a law review article that introduced the idea. See Paul A. Ferrillo, Frederick C. Dunbar, & David Tabak, *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, 119–22 (2004) (the “FDT Article”). In the FDT Article, Dr. Tabak advocates using a comparative test—a “z-test” or the “FDT test”—to evaluate whether and how security prices respond to news.

A “z-test” is a “method of comparing the proportions of statistically significant observations in two samples” that is “essentially a version of the more famous [] ‘t-test.’” *Petrobras I*, 312 F.R.D. at 369; see also *Reference Manual on Scientific Evidence* 299–300 (3d ed. 2011) (“Reference Manual on Sci. Evid.”) (explaining that when a sample is large, many authors refer to the z-test and z-statistic rather than the t-test and t-statistic). “There is no dispute that z-tests are commonly used and widely accepted statistical tools.” *Petrobras I*, 312 F.R.D. at 369; see also McConnell Depo. Tr., Ex. 3 to Pls.’ *Daubert* Opp’n, Doc. No. 686-3, at 82:11–83:2.

Dr. Tabak ran several z-tests in this case. More specifically, Dr. Tabak performed z-tests with four different sets of news and non-news days for each security. The first set of news days consisted of “days with Teva earnings announcements” (the “Earnings Announcements test”). Tabak Report at ¶ 41; see also Ex. 8e to Tabak Report, Doc. No. 419-5, at 191–92. Although earnings announcement days are likely to contain material information about a company, Dr. Tabak points out that “news about a company can arrive on days other than earnings-announcement dates.” Tabak Report at ¶ 42. As a result, the set of non-news days in the Earnings Announcements test will likely contain some number of days with material information

about Teva. That mixing leads to “attenuation bias,” which is when “statistical measurements (such as the difference between two sets of days) are reduced, or attenuated, in the presence of data issues.” Tabak Rebuttal Report at ¶¶ 74–77, 147–51. Dr. Tabak notes that attenuation bias in the Earnings Announcements test might “make it harder for a comparison” of the two sets “to show that Teva’s securities’ prices responded to news.” Tabak Report at ¶ 42.

The second set of news days consisted of “days with stories published by the *Dow Jones Newswires*” that mentioned “Teva Pharmaceutical Industries Ltd” or a variation on that name (the “*DJN* test”). *Id.* Excluded from the *DJN* news days were all stories that “merely comment[ed] on Teva’s stock price or volume.” *Id.* at ¶ 42 n.26; *see also* Ex. 8d to Tabak Report, Doc. No. 419-5, at 190.

The third and fourth sets of news days were subsets of the *DJN* news days. The third set of news days consisted of the “top half” of the *DJN* news days—that is, “those days with more news stories than the bottom half” (the “Top 50% test”). Tabak Report at ¶ 42. The fourth set of news days consisted of the top ten percent of the *DJN* news days (the “Top 10% test”). *See id.* The idea behind testing all three sets of *DJN* news days was to evaluate whether the difference between statistically significant returns in the news and non-news sets increased as the set of news days became more material.

That theory assumes that the news days in the Top 10% test contained the most material news of the three categories. *See id.* (“[T]he more material a news item is, the more likely it is to either be repeated or updated during the same trading day.”). The Defendants contest that assumption. *See* Bajaj Report at ¶¶ 99–102 (claiming that Dr. Tabak’s theory “has no basis in economics and assumes a causality that his own data suggests could just as likely run in the other direction”). But Dr. Tabak asserts that the academic field of “content analysis” supports the

assumption. See Tabak Rebuttal Report at ¶ 158d (citing John M. Griffin, *et al.*, *How Important is the Financial Media in Global Markets?*, Vol. 24, No. 12 THE REVIEW OF FIN. STUDIES 3941, 3964 (2011) (the “Financial Media Article”); Tomas Reyes, *Limited Attention and M&A Announcements*, 49 J. OF EMPIRICAL FIN. 201, 211 (2018)). I will further address this issue below.

In addition to performing z-tests with all four sets of news and non-news days for each of the securities at issue, Dr. Tabak performed a parallel test called the Kolmogorov-Smirnov test (the “K-S test”). Whereas z-tests compare two proportions, K-S tests compare the distribution of the absolute value of excess returns in two sets. See Tabak Report at ¶ 48; Bajaj Report at ¶ 46 (characterizing the K-S test as “very similar” to the z-test). Perhaps because the tests are “very similar,” the Defendants’ challenges often apply equally to both types of test. For simplicity, I will not discuss K-S tests separately, except where appropriate.

a. Dr. Tabak’s *Cammer* 5 Event Study

Regarding the ADS, in the Earnings Announcements test, 77.3 percent of news days exhibited statistically significant excess returns, compared with just 12.3 percent of non-news days. In the *DJN* test, 16.8 percent of news days exhibited statistically significant excess returns, compared with 9.8 percent of non-news days. In the Top 50% test, 25.1 percent of news days exhibited statistically significant excess returns, compared with 10.5 percent of non-news days. And in the Top 10% test, 42.9 percent of news days exhibited statistically significant excess returns, whereas 11.9 percent of non-news days did the same. All those differences were statistically significant. See Ex. 8a-a to Tabak Report, Doc. No. 419-5, at 177. Thus, the ADS “passed” all four z-tests. Similarly, the ADS passed all four K-S tests. See Ex. 8c-a to Tabak Report, Doc. No. 419-5, at 185. Dr. Tabak opined that those results were “very strong evidence

that Teva's ADS price responded to new information during the Class Period." Tabak Report at ¶ 49.

The Preferred Shares also passed all eight z-tests and K-S tests. *See* Exs. 8a-b, 8c-b to Tabak Report, Doc. No. 419-5, at 178, 186. Based on those results, Dr. Tabak again concluded that "very strong evidence" indicated that the Preferred Shares "responded to new information." Tabak Report at ¶ 50.

Dr. Tabak's tests for the Notes revealed more mixed results. In all four tests, the Notes exhibited higher percentages of days with statistically significant excess returns on news days than on non-news days. However, the difference between the two was only sometimes statistically significant. In Dr. Tabak's view, the "main result" is that in the Top 10% test the difference between the news and non-news days' statistically significant excess returns was itself statistically significant for all six Notes. *See* Tabak Report at ¶ 51; Ex. 8a-c to Tabak Report, Doc. No. 419-5, at 179. In the K-S test, too, all the Notes pass the Top 10% test. *See* Ex. 8c-c to Tabak Rebuttal Report, Doc. No. 656-10, at 213–14.²² In Dr. Tabak's view, "it is not surprising that the results" of the *DJN* tests "are weaker for the broader categories of news days" because only the most important information about Teva will affect the Notes, which are senior to Teva's equity. *See* Tabak Report at ¶ 51. Dr. Tabak has the same view about the earnings announcement dates. *See id.* In sum, although the above results are "mixed," Dr. Tabak concluded that they "support the conclusion that the Notes respond to relevant news, but that the set of news events that are relevant for the Notes is more restrictive than the sets of news relevant for the ADS or the Preferred Shares." *Id.*

b. Topics of Dispute

²² Dr. Tabak submitted a revised version of Ex. 8c-c. *Compare* Ex. 8c-c to Tabak Report, Doc. No. 419-5, at 187–89 *with* Ex. 8c-c to Tabak Rebuttal Report, Doc. No. 656-10, at 213–14.

The Defendants make numerous challenges to Dr. Tabak’s methodology and conclusions—in both their opposition to class certification and their *Daubert* motion. In fact, the Defendants’ *Daubert* challenge and opposition to class certification are almost entirely duplicative. Although I address the Defendants’ *Daubert* motion separately below, the following discussion contains limited reference to materials submitted as part of the *Daubert* motion briefing. Including that material here allows me to address topics more fully and logically.

In support of their position, the Defendants produced two experts to challenge Dr. Tabak’s conclusions regarding market efficiency: Dr. Mukesh Bajaj²³ and Dr. John McConnell. Rather than claiming that the market for any of the Teva Securities was inefficient, the Defendants argue that Dr. Tabak’s tests are unreliable, and so the Plaintiffs have not met their burden of showing that the Teva Securities traded in efficient markets. In my view, although some of the Defendants’ concerns have a modicum of merit, they do not seriously undercut Dr. Tabak’s conclusions.

i. FDT Test Design

The Defendants claim that Dr. Tabak’s tests do not test for “market efficiency” because they do not measure whether the prices of the Teva Securities “rapidly incorporate all publicly available information.” Defs.’ Class Cert. Opp’n, Doc. No. 508, at 18; *see also* McConnell Report at ¶ 41. According to the Defendants, the proper way to test for “market efficiency” is to

²³ As a general matter, the Plaintiffs point out that many of Dr. Bajaj’s positions and statements in his expert report in this case are inconsistent with positions and statements that Dr. Bajaj made in a prior, plaintiffs’-side expert report. *See* Tabak Rebuttal Report at ¶¶ 3a, 3d, 9, 17–18, 153, 165, 172, 177; *Allergan* Bajaj Report, Ex. 3 to Tabak Rebuttal Report, Doc. No. 656-10, at 121–77. I agree with the Plaintiffs that in the *Allergan* Bajaj Report, Dr. Bajaj espoused views on certain topics—namely, (1) the importance of the “indirect” *Cammer* factors, (2) the significance of limited autocorrelation, and (3) the possibility of relatively slow market absorption of publicly available news—that appear to align with Dr. Tabak’s views in this case. Thus, as a general matter, I take Dr. Bajaj’s critiques with a grain of salt.

To be sure, the Defendants also make similar claims about Dr. Tabak. *See, e.g.,* Bajaj Report at ¶¶ 51, 76 n.128, 100. I address those critiques below, but, as a general matter, I find them much less persuasive than the Plaintiffs’ critiques of Dr. Bajaj.

“assume[] that the market is semi-strong-form efficient (*the null hypothesis*)²⁴ and test[] whether sufficient evidence is available to reject the null hypothesis and, thereby, conclude that the market is *not* semi-strong-form efficient (*the alternative hypothesis*).” McConnell Report at ¶ 39. Put differently, “[f]or a security to be trading in a semi-strong efficient market, news matters, and the security should respond each time to new, material, unexpected information.” *Id.* at ¶ 48. In the Defendants’ view, “the proportion of statistically significant news days should be 100%.” *Id.* at ¶ 76.

However, the Defendants explain, Dr. Tabak’s tests actually examine “whether the market violates a specific form of market *inefficiency*.” *Id.* at ¶ 21. More specifically, Dr. Tabak’s tests assume as the null hypothesis that a security’s price does not respond to news. *See* Tabak Depo. Tr., Ex. F to Defs.’ *Daubert* Mot., Doc. No. 678-7, at 22:18–23:3. If a security passes Dr. Tabak’s tests, then the null hypothesis is rejected, and one can say that a security’s price does, to some extent, respond to news (to a degree of statistical certainty). In the Defendants’ view, that conclusion is irrelevant because “Plaintiffs cannot establish that securities prices ‘rapidly incorporate all publicly available information’ by disproving the proposition that the market *never* incorporates public information.” Defs.’ Class Cert. Opp’n, Doc. No. 508, at 18 (cleaned up).

The Defendants claim that Dr. Tabak’s tests can lead to odd results that seem incompatible with market efficiency. More specifically, because Dr. Tabak’s tests measure the *difference* between excess returns on news and non-news days, even securities whose prices

²⁴ “In regression analysis the null hypothesis states that the results observed in a study with respect to a particular variable are no different from what might have occurred by chance, independent of the effect of that variable.” Reference Manual on Sci. Evid. at 354. “At the outset of any observational or experimental study, the researcher must state a proposition that will be tested in the study.” *Id.* at 625 (defining “null hypothesis” in context of epidemiological studies). “The results of the study may justify a conclusion that the null hypothesis (no association) has been disproved” or they “may fail to disprove the null hypothesis, but that alone does not justify a conclusion that the null hypothesis has been proved.” *Id.*

respond abnormally to news in a statistically significant way a small percentage of the time might pass the tests. *See, e.g.*, Ex. 8a-a to Tabak Report, Doc. No. 419-5, at 177 (ADS pass *DJN* test even though they exhibited statistically significant excess returns on only 16.8 percent of news days); *see also* McConnell Report at ¶ 77 (noting that several securities pass z-test even though the percentage of days with statistically significant returns on news days “is not close to 100%”); Bajaj Report at ¶ 32 (“Even if one could establish that the market reacted to material news 50% of the time, it would still be impossible to assume that each material disclosure defect distorted the stock price.”). To the Defendants, that is a fatal flaw.

In reply, the Plaintiffs argue that Dr. Tabak’s tests are properly designed. The Plaintiffs point out that the Defendants do not offer a reliable alternative method to test for 100 percent price responsiveness to news. To be sure, it might be possible to demonstrate 100 percent price responsiveness if an expert used a proof-by-example model that “cherry-pick[ed] just [] one or two news events” to test *Cammer 5*. *See* Tabak Rebuttal Report at ¶ 60. However, in the context of Dr. Tabak’s tests, which examine a broad set of news, the Defendants’ arguments are overly simplistic and set forth an impossible test. *See id.* at ¶ 58. Relatedly, Dr. Tabak notes that the proper null hypothesis for his tests is that prices do not respond to news. *Id.* at ¶¶ 30–34 (pointing out that Dr. Bajaj has agreed in expert reports in prior cases). That is because the FDT test is not an omnibus test for market efficiency, but, rather, a limited test of *Cammer 5*, which examines price responsiveness to news. *See id.* at ¶ 30. The Plaintiffs also emphasize that the Defendants’ definition of “market efficiency”—that for a market to be “efficient” it must immediately incorporate all material, unexpected information²⁵—runs counter to both binding legal authority and empirical evidence.

²⁵ *See, e.g.*, McConnell Depo. Tr., Ex. A to Pl.’s Class Cert. Reply, Doc. No. 656-1, at 39:12–23 (explaining that if a security took longer than one second to incorporate newly public information, the market for

Dr. Tabak’s tests in this case were not improperly designed. An event study testing *Cammer* 5 need not provide standalone proof of market efficiency. *See Petrobras II*, 862 F.3d at 277 (noting that “[t]he district court properly declined to view direct and indirect evidence as distinct requirements, opting instead for a holistic analysis based on the totality of the evidence presented”); *Waggoner*, 875 F.3d at 97–98. Similarly, there is no rule that an event study testing *Cammer* 5 must assume market efficiency as the null hypothesis. A proper *Cammer* 5 test should “allege empirical facts showing a cause and effect relationship between unexpected corporate events or financial releases and an immediate response in the stock price.” *Cammer*, 711 F. Supp. at 1287.

Dr. Tabak does not claim that his FDT test is a standalone test of market efficiency. *See* FDT Article, Doc. No. 508-5, at 44 (explaining that “this test is a threshold step, not a sufficient condition, to show that a stock traded in an efficient market”); Tabak Rebuttal Report at ¶ 30. Instead, the FDT test assumes that news does not affect prices and seeks to disprove that null hypothesis. When a security passes the FDT test, that does not “prove” efficiency. *See* Tabak 2010 Article, Doc. No. 508-6, at 8 (admitting that “[t]here are several ways that versions of the FDT methodology may not be able to fully distinguish an efficient market from an inefficient one”). It merely suggests that news, to a degree of statistical significance, affects the price of that security to some degree.

It is also not concerning that some of the Teva Securities pass Dr. Tabak’s tests even though they show statistically significant price responsiveness to news on a relatively low percentage of days. The Defendants focus especially on the fact that the ADS passed the *DJN* test with just 16.8 percent price responsiveness to news days. *See* Hr’g Tr., Doc. No. 703, at

that security would be inefficient); Bajaj Report at ¶ 44 (“Either the market is efficient, or it is not. There is no ‘mild’ form of inefficiency.”).

43:23–44:5. Admittedly, that is not the Plaintiffs’ strongest evidence. But the result is not altogether surprising. First, the news in the *DJN* test is a broad set and certainly contains some immaterial information. Second, the FDT test is *comparative*. For that reason, courts have held that there is no threshold percentage of price responsiveness that a security must meet to support a finding of market efficiency. See *McIntire*, 38 F. Supp. 3d at 430; *Första AP-Fonden v. St. Jude Med., Inc.*, 312 F.R.D. 511, 521 (D. Minn. 2015); *Cosby*, 2020 WL 3548379, at *16. Empirically, it is unlikely that a security would exhibit statistically significant excess returns on 100 percent of anything but the most cherry-picked material news days. See Tabak Rebuttal Report at ¶¶ 54–57; see also David Tabak, *What Should We Expect When Testing for Price Response to News in Securities Litigation?* 9, NERA CONSULTING (Aug. 2016), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2824565 (the “Tabak 2016 Article”) (reporting that “only 2.2% of S&P 500 companies have more than 80% of their earnings announcements associated with statistically significant returns”). Perhaps recognizing that reality, the Supreme Court has clearly held that “*Basic*’s presumption of reliance [] does not rest on a ‘binary’ view of market efficiency” and recognized that “market efficiency is a matter of degree.” *Halliburton II*, 573 U.S. at 272. In sum, I do not share the Defendants’ concerns with Dr. Tabak’s tests in this case.

ii. Peer Review

The Defendants attack Dr. Tabak’s tests as “junk science”—a “fringe made-for-litigation methodology.” See Defs.’ Mem. of Law in Supp. *Daubert* Mot., Doc. No. 678-1, at 6 (“*Daubert* Mem.”); Hr’g Tr., Doc. No. 703, at 73:16. To that end, the Defendants emphasize the dearth of relevant peer review. See Defs.’ Class Cert. Opp’n, Doc. No. 508, at 16 (claiming that there is “no support in the peer-reviewed economics, finance, or accounting literature for” Dr. Tabak’s

tests); *see also* McConnell Report at ¶¶ 30–37 (explaining the importance of peer review); Bajaj Report at ¶ 57 (“Dr. Tabak’s z-test is simply his own self-invented and made-for-litigation methodology that makes no economic sense.”). The Defendants argue that I should exclude—or at least reject on the merits—Dr. Tabak’s tests in part for that reason.

The Plaintiffs take a different view. Although the FDT Article itself was not peer-reviewed (it appeared in a law review), many peer-reviewed articles support it. Most directly, in October 2020, the FDT Article was cited in a peer-reviewed article that “follow[ed] the methodology set forth in the FDT Article, as well as the methodology Dr. Tabak applied in this case.” Pls.’ *Daubert* Opp’n, Doc. No. 686, at 26; *see also* O. Miguel Villanueva & Steven Feinstein, *Stock price reactivity to earnings announcements: the role of the Cammer/Krogman factors*, REVIEW OF QUANTITATIVE FIN. AND ACCOUNTING (2020), Ex. 4 to Pls.’ *Daubert* Opp’n, Doc. No. 686-4 (the “Villanueva Article”).²⁶ More obliquely, the Plaintiffs note that various theoretical pillars supporting the FDT test—*e.g.*, the theories that (1) “days with news are more likely to be associated with large price movements, though not all news days are,”²⁷ (2) the more material a news item is, the more likely it is to be repeated or updated in further news stories

²⁶ The Defendants minimize the importance of the Villanueva Article. The Defendants argue that the Villanueva Article’s authors “are economists who frequently testify for plaintiffs.” *Daubert* Mem., Doc. No. 678-1, at 22. In addition, one of the authors, Steven Feinstein, “has had his opinions on the subject of market efficiency—which were based primarily on Dr. Tabak’s FDT test—excluded on *Daubert* grounds.” *Id.*; *see also* Defs.’ *Daubert* Reply, Doc. No. 696, at 9–11. The Plaintiffs point out that the potential biases of the authors are irrelevant because the hyper-critical peer review process ensures the quality of published articles, a point that the Defendants themselves previously emphasized. *See* Pls.’ *Daubert* Opp’n, Doc. No. 686, at 27; McConnell Report at ¶¶ 34–36.

²⁷ For that proposition, the Plaintiffs rely mostly on the Financial Media Article. The Financial Media Article is primarily a comparative study concerned with quantifying the financial media’s importance internationally and understanding why its impact might vary across countries. *See* Financial Media Article at 3941–42. The Financial Media Article notes that “[i]n most developed markets, a firm’s stock price moves much more on days with public news about the firm” and indicates that many news days will not be associated with a statistically significant stock price increase. *See id.* at 3941, 3969–72. But those are not the Article’s primary conclusions. Thus, I agree with the Defendants that the Financial Media Article overlaps with only “some generalized aspects of Dr. Tabak’s analysis.” *Daubert* Mem., Doc. No. 678-1, at 20.

(“content analysis”),²⁸ and (3) price changes tend not to “cause” news stories²⁹—have been subject to peer review. *See* Tabak Rebuttal Report at ¶¶ 38–43, 50–53, 91, 158.

In my view, the amount of peer review of the FDT test is not particularly important. If the FDT test were routinely cited in peer-reviewed financial economics journals, that would give me even more confidence in Dr. Tabak’s results in this case. But the lack of such peer-reviewed citations does not give me much pause. In *Petrobras I*, the defendants also objected to the plaintiffs’ expert’s FDT test based on a lack of peer review. *Petrobras I*, 312 F.R.D. at 369.

Judge Rakoff rejected that concern:

Were [the plaintiffs’ expert] using a novel or questionable statistical technique, the Court would place more weight on the absence of peer review. But it is not necessary for every application of a commonly used statistical technique to be peer-reviewed Because . . . the z-test is a well-established and sound statistical technique, the lack of peer review does not seriously undermine [the plaintiffs’ expert’s] application of the z-test.

Id. I agree with Judge Rakoff: The FDT test is, essentially, an application of a basic statistical tool.

It is also unsurprising that the FDT test has not garnered much attention from financial economics journals. The FDT test was created to address a recurring factor that arises in

²⁸ The Plaintiffs again rely on the Financial Media Article to support that proposition. The Financial Media Article uses “the ratio of the number of articles in the earnings-event window relative to the number of articles in the pre-event window” as a “proxy for the financial sophistication of the news.” Financial Media Article at 3947. Similarly here, Dr. Tabak uses “the number of news stories on a day as a proxy for materiality” of the news. Tabak Rebuttal Report at ¶ 158e. That parallelism seems to support the Plaintiffs’ view. However, the Financial Media Article never mentions the phrase “content analysis” or indicates that it relies on that theory.

²⁹ For that proposition, the Plaintiffs cite Jacob Boudoukh, *et al.*, *Information, Trading, and Volatility: Evidence from Firm-Specific News*, Vol. 32, Issue 3 THE REVIEW OF FIN. STUDIES 992 (Mar. 2019) (the “Boudoukh Article”), available at https://en-recanati.m.tau.ac.il/sites/nihul_en.tau.ac.il/files/media_server/Recanati/management/seminars/account/2017/Shimon_Kogan_2017.pdf. The Boudoukh Article investigates whether publicly available news is, in fact, “an important source for stock price volatility.” *Id.* at Abstract. In examining its data, the Boudoukh Article notes: “*Ex-ante*, one might have imagined that large price moves would have generated ‘news’ stories, but this result shows that there is no mechanical relation between news and firm volatility.” *Id.* at 13 (e-version cited above). That statement supports Dr. Tabak’s view. However, the Boudoukh Article examines a far stricter set of news than does Dr. Tabak in this case. *See id.* at 7 (explaining that the authors first identified a large pool of potential news from the *Dow Jones Newswires* but then culled that set using “a rule-based information extraction platform” and a “machine learning algorithm[] to process text”); Bajaj Decl. at ¶ 33 (making that point); *Daubert* Mem., Doc. No. 678-1, at 21 n.2.

securities litigation. (I address below the Defendants’ related argument that I should be skeptical of the FDT test for that reason.) Indeed, as Dr. Bajaj—the Defendants’ own expert—readily admitted, whether and how the prices of a single firm’s securities reacted to news during some period in the past is “not an interesting issue for an academic study.” Bajaj Depo. Tr., Ex. D to Pl.’s Class Cert. Reply, Doc. No. 656-4, at 182:1–14; *cf. Daubert*, 509 U.S. at 593 (“Some propositions . . . are too particular, too new, or of too limited interest to be published.”).

Further, the FDT test bears other indicia of reliability that are not the same as peer review, but are similar. Numerous courts have accepted the FDT test (or a similar comparative test) as a sound statistical method. *See, e.g., Petrobras I*, 312 F.R.D. at 369; *McIntire*, 38 F. Supp. 3d at 430; *In re Alstom SA Sec. Litig.*, 253 F.R.D. 266, 280 (S.D.N.Y. 2008); *In re Vale S.A.*, 2019 WL 11032303, at *11; *St. Jude Med., Inc.*, 312 F.R.D. at 520–22; *Cosby*, 2020 WL 3548379, at *14–16; *Angley v. UTi Worldwide Inc.*, 311 F. Supp. 3d 1117, 1122–27 (C.D. Cal. 2018); *In re NII Holdings, Inc. Sec. Litig.*, 311 F.R.D. 401, 411–12 (E.D. Va. 2015). Some courts, too, refer to the FDT Article and Dr. Tabak as leading authorities regarding *Cammer 5* testing. *See, e.g., Petrobras I*, 312 F.R.D. at 369 (referring to the FDT Article as “a law review article by three well-known securities econometric experts”); *McIntire*, 38 F. Supp. 3d at 430 (referring to the authors of the FDT Article as “accomplished economists”). Even one of the cases on which the Defendants rely to undermine the FDT test cited Dr. Tabak as a “well-known securities econometric expert[.]” and relied on both the FDT Article and the Tabak 2016 Article in explaining why a different expert’s *Cammer 5* test was inadequate. *Ohio Pub. Emps. Ret. Sys. v. Fed. Home Loan Mortg. Corp.* (“*OPERS*”), 2018 WL 3861840, at *3–4, *10 (N.D. Ohio Aug. 14, 2018).

Finally, the peer-reviewed financial economics literature cited by the parties is not especially noteworthy. To be sure, the Villanueva Article cites the FDT Article and relies substantially on the FDT methodology. But that is just one article. It is also true that other peer-reviewed articles seem to corroborate certain generalized aspects of the FDT test. *See supra* nn. 27–29. But those are only high-level concepts. In sum, the peer-reviewed literature that the Plaintiffs cite neither boosts nor invalidates the use of Dr. Tabak’s tests in this case. Simply put, the extent of peer review of the FDT test is not particularly relevant.

iii. Directionality

“Directionality” refers to whether a statistically significant excess return is in the “correct” direction. That is: Did an abnormally positive (or negative) return in fact occur in response to unexpectedly positive (or negative) news? *See* Tabak Report at ¶¶ 11, 38. Indisputably, Dr. Tabak did not test for directionality.

The Defendants claim that that failure renders Dr. Tabak’s analysis meaningless. *See* Bajaj Report at ¶ 65 (calling directionality a “fundamental element of market efficiency”); McConnell Report at ¶¶ 65–69. To illustrate the problem, Dr. Bajaj identifies two dates during the Class Period that exhibit directionality issues. On the first, Dr. Tabak calculated a positive excess return for the ADS, but news stories released immediately before the relevant trading day reported negative information about Teva. *See* Bajaj Report at ¶ 68. On the second, Dr. Tabak calculated negative excess returns for the ADS, but positive excess returns for three Notes. *See id.* at ¶ 69. In Dr. Bajaj’s view, the relevant news stories reported positive information about Teva, and so the price movement of the ADS was in the “wrong” direction. *See id.* Further, Dr. Bajaj expresses curiosity at how Dr. Tabak counts positive returns and negative returns for different Teva Securities on the same day (and thus in response to the same information) both as

evidence of market efficiency. *See id.* at ¶ 70. Finally, Dr. Bajaj notes that—had Dr. Tabak used particular “consensus” estimates for classifying earnings announcements—Dr. Tabak would have seen that five of the 17 earnings dates on which he calculated excess returns for the ADS were in the “wrong” direction. *See id.* at ¶¶ 71–72.

The Plaintiffs disagree. They claim that applicable law does not require Dr. Tabak’s event study to consider directionality. In the Plaintiffs’ view, that is for good reason: Directionality can be quite difficult to determine. Dr. Tabak notes that although the Defendants’ experts insist on a directional analysis, they provide no “evidence that one can generally identify the ‘direction’ of the news in a reliable, objective fashion.” Tabak Rebuttal Report at ¶ 82. On the other hand, Dr. Tabak cites academic literature showing that even for earnings surprises—which should “be the easiest news from which to infer directionality”—it can be difficult to predict directionality correctly even 65 percent of the time. Tabak Rebuttal Report at ¶¶ 83–86 & nn.72–73; *see also* Tabak 2016 Article at 9–14. That is because dates with positive (or negative) earnings surprises can also contain other news that is less (or more) rosy. Tabak Rebuttal Report at ¶ 85.

According to the Plaintiffs, Dr. Bajaj’s observations prove the point. Dr. Bajaj identified five earnings announcement dates that, in his view, exhibited reverse directionality. But Dr. Bajaj did not examine news on those days *other than* the earnings announcements. *See* Bajaj Depo. Tr., Ex. D to Pl.’s Class Cert. Reply, Doc. No. 656-4, at 154:24–55:7. In fact, other Teva-related news on at least four of those dates was, arguably, negative. *See* Tabak Rebuttal Report at ¶ 109. In the same vein, Dr. Tabak challenges the two other dates on which Dr. Bajaj claimed mismatched directionality. *See id.* at ¶¶ 115–19 (explaining that Dr. Bajaj’s analysis of the news’s import on one day was “disputable” and on the other day was “wrong because the Bajaj

Report misses key news”). Finally, the Plaintiffs argue that it is not eyebrow-raising that Dr. Bajaj identified a day on which the ADS and Notes moved in different directions: The same information can impact the prices of equity and debt in different ways, something that Dr. Bajaj himself acknowledges. *See id.* at ¶¶ 120–22 (citing Bajaj Depo. Tr., Ex. D to Pls.’ Class Cert. Reply, Doc. No. 656-4, at 87:25–88:5).

In my view, Dr. Tabak’s failure to assess directionality does not at all diminish the weight I afford his tests in this case. I acknowledge the possibility that—on some dates—Dr. Tabak may have calculated statistically significant positive (or negative) excess returns to negative (or positive) news. But that possibility does not give me much pause. First, even if there were some small number of directionally mismatched dates in Dr. Tabak’s results, those “errors” would be relatively unimportant because of the scale of Dr. Tabak’s tests: He examined over 1,300 trading days. Second, predicting directionality is a subjective exercise that would add little to Dr. Tabak’s tests. The debate between Dr. Tabak and Dr. Bajaj regarding five particular earnings announcement dates illustrates the point. *Compare* Bajaj Report at ¶¶ 71–72 (identifying five potential directional errors) *with* Tabak Rebuttal Report at ¶ 109 (rebutting four of the five). Relatedly, I am persuaded by Dr. Tabak’s report that it can be difficult to predict directionality correctly for earnings surprises even 65 percent of the time. Tabak Rebuttal Report at ¶¶ 83–86 & nn.72–73; *see also* Tabak 2016 Article at 9–14.

Interpretation of news is complex. In my view, it is a virtue that Dr. Tabak does not analyze the news’ content before running his tests. By reducing subjectivity in that way, Dr. Tabak’s tests give me confidence that Dr. Tabak has not intentionally (or unconsciously) influenced the outcome of his test results. Numerous other courts have also credited non-directional event studies. *See, e.g., Wilson*, 2018 WL 3913115, at *14 (“[T]he lack of the

inclusion of directionality analysis in [the plaintiffs' expert's] event study does not require us to discount this report's usefulness in determining market efficiency."); *In re Vale S.A.*, 2019 WL 11032303, at *12 (holding that "a test of directional consistency, if it were feasible, would only serve as an additional robustness check on Dr. Tabak's original event study," but "the lack of a directional consistency check does not undermine his conclusions"); *cf. Waggoner*, 875 F.3d at 97 (noting that, in *Petrobras II*, the Second Circuit "rejected the argument that 'directional' direct evidence of price impact was required by *Cammer 5*") (cleaned up). For those reasons, Dr. Tabak's failure to consider directionality does not weaken his results.

iv. Reverse Causality

The Defendants assert that Dr. Tabak's tests suffer from reverse causality errors. Dr. Tabak's interpretation of his results rests on the assumption that "the more material a news item is, the more likely it is to either be repeated or updated during the same trading day." Defs.' Class Cert. Opp'n, Doc. No. 508, at 23 (quoting Tabak Report at ¶ 42). Based on that assumption, it makes sense that the Top 10% test yields the strongest results of price responsiveness to news—and that the *DJN* test yields the weakest. However, the Defendants claim, that assumption is unfounded because the causality could "just as likely" run in the reverse direction. *See* Bajaj Report at ¶¶ 85–108. That is: "Dr. Tabak's results may 'become stronger' (i.e., the proportion of statistically significant 'news' days increases) because the news count increased because the price movement was larger, not because the news count increased as stories were 'more material.'" Defs.' Class Cert. Opp'n, Doc. No. 508, at 25 (quoting Tabak Report at ¶ 47); *see also* McConnell Report at ¶ 74 ("Because Dr. Tabak does not consider the time of day in any of his *Dow Jones Newswires* tests, Dr. Tabak does not know whether it was

the news that caused the significant price change or whether the significant price change caused the news.”).

In Dr. Bajaj’s view, that reverse causality problem shows itself in Dr. Tabak’s results. For instance, Dr. Bajaj identifies a specific day—February 1, 2017—on which Dr. Tabak calculated a statistically significant excess return for the ADS. That day, 86 percent of the price change for the ADS occurred before 1:45 p.m., which was when the first *DJN* news story about Teva during that trading day was published. *See* Bajaj Report at ¶ 91. In other words, 86 percent of the price movement for the ADS on February 1, 2017 could not have been caused by the relevant *DJN* news stories because it occurred before the stories were published.

Dr. Bajaj also manipulated Dr. Tabak’s data in an attempt to show the extent of the reverse causality problem. Dr. Bajaj divided all the *DJN* news articles—over 2,300 articles, *see* Ex. 2 to Tabak Report, Doc. No. 419-5, at 64–113—into “pre-open stories” (stories published between the close of trading on the NYSE on one day (4 p.m.) and the open of trading on the NYSE the following day (9:30 a.m.) and “open to close stories” (stories published during trading hours—from 9:30 a.m. to 4 p.m.). *See* Bajaj Report at ¶ 93. Dr. Bajaj then “divided Dr. Tabak’s close to close ADS returns into two parts using the same sub-periods.” *Id.* at ¶ 95. Dr. Bajaj performed a z-test “in which returns over a preceding period are matched against stories in the subsequent period” and found statistically significant results. *Id.* at ¶ 97. Dr. Bajaj concludes: “Since stories could not possibly ‘cause’ preceding returns, my evidence shows that Dr. Tabak would illogically conclude market efficiency even when there is no cause and effect.” *Id.*

Dr. Bajaj also ran a simulation in which, so far as I understand it, he randomized the days that were characterized as news days and then assigned a random number of stories to each of those randomized news days. *See id.* at ¶¶ 104–05. However, Dr. Bajaj “assign[ed] a larger

number of stories on average [to] those days which had a larger return.” *Id.* at ¶ 105. In other words, Dr. Bajaj “introduce[d] a statistical correlation between the number of stories and magnitude of the observed return.” *Id.* Dr. Bajaj performed a z-test and a K-S test on that new data set and found that the “false positive error rate” for the new Top 50% and Top 10% tests was 89.9 and 98.9 percent, respectively. *See id.* at ¶ 106. Dr. Bajaj concludes: “[I]f the market was simply (and ‘completely’) inefficient by design according to his own z-test, the reverse causality problem alone could lead one to falsely conclude the market is efficient 89.9% of the time for Dr. Tabak’s Top 50% z-test and 98.9% of the time for his Top 10% z-test.” *Id.*

The Plaintiffs downplay the Defendants’ “theoretical” reverse causality concerns. *See* Tabak Rebuttal Report at ¶ 90. First, Dr. Tabak reiterates that his approach of using the number of news stories as a proxy for materiality is supported by the academic theory of content analysis. *See id.* at ¶ 158e. Second, Dr. Tabak claims that Dr. Bajaj’s singling out February 1, 2017 “proves little.” *Id.* at ¶ 158a. That is both because February 1, 2017 is a single example and because of the possibility of “news leakage,” which occurs when news “enter[s] the market by means other than formal news sources.” *Id.* at ¶¶ 153–54. Third, Dr. Tabak essentially disregards the results of Dr. Bajaj’s simulation. According to Dr. Tabak, Dr. Bajaj’s simulation was “set up to fail” based on “obviously unreasonable and unrealistic” assumptions “that there are more news stories when there are price movements” and that “*all* of these news stories are meaningless.” *Id.* at ¶ 101 n.82.

In any event, because Dr. Tabak concedes that Dr. Bajaj’s reverse causality critique is a “potentially valid theoretical criticism,” Dr. Tabak re-ran his *DJN* tests. More particularly, Dr. Tabak re-defined *DJN* news days to be days with news stories that were published *outside* NYSE trading hours. *See id.* at ¶ 93. According to Dr. Tabak, because there are no price changes while

the NYSE is closed, those stories “cannot be driven by changes in prices in the United States markets.” *Id.* The results of Dr. Tabak’s updated tests changed very little. The ADS still passed all four versions of the z-test and all four versions of the K-S test. *See* Exs. 4a-a, 4c-a to Tabak Rebuttal Report, Doc. No. 656-10, at 178, 182. The Preferred Shares passed all four versions of the z-test and three of the four versions of the K-S test. *See* Exs. 4a-b, 4c-b to Tabak Rebuttal Report, Doc. No. 656-10, at 179, 183.³⁰ According to Dr. Tabak, the Notes exhibited “marginally worse results.” Tabak Rebuttal Report at ¶ 94c. Still, the Notes all exhibited increased price responsiveness to news as the set of *DJN* news became more restrictive. *See* Exs. 4a-c, 4c-c to Tabak Rebuttal Report, Doc. No. 656-10, at 180–81, 184–85. Five of the six Notes (all except the 2018 Notes) passed the Top 10% z-test, and all six Notes passed the Top 10% K-S test. *See id.* In Dr. Tabak’s view, those results “verif[y]” his previous results. *See* Tabak Rebuttal Report at ¶ 94c. Dr. Tabak notes that the attenuation bias in these *DJN* tests is even stronger than in his original *DJN* tests because the “non-news” sets now include days on which Teva-related news stories were published during trading hours. *See id.*

In a declaration in support of the Defendants’ *Daubert* motion, Dr. Bajaj responded to Dr. Tabak’s rebuttal report. *See* Bajaj Decl., Ex. G to Defs.’ *Daubert* Mot., Doc. No. 678-8 (the “Bajaj Declaration”).³¹ Dr. Bajaj argues that Dr. Tabak’s revised tests—defining news days as only those days with stories published outside of NYSE trading hours—does not eradicate the

³⁰ The version of the K-S test that the Preferred Shares failed was the broadest test—the *DJN* test—and the Preferred Shares would have passed the test at a 10 percent level of statistical significance.

³¹ The Plaintiffs argue that I should not consider the Bajaj Declaration because it is really an improper expert report. *See* Pls.’ *Daubert* Opp’n, Doc. No. 686, at 34. Because the Bajaj Declaration was submitted outside of the expert discovery and briefing period, Dr. Tabak has not had an opportunity to address the Bajaj Declaration in an opposing report or declaration. In any event, because I must undertake a “rigorous analysis,” I consider the Bajaj Declaration on the merits and accord it the weight that, in my view, it deserves. In the end, my decision does not disadvantage the Plaintiffs because I give the Bajaj Declaration little weight, and it does not affect my decision to deny the Defendants’ *Daubert* motion and grant the Plaintiffs’ class certification motion. In the Bajaj Declaration, Dr. Bajaj reiterates his previous claims regarding (1) the design of Dr. Tabak’s tests (¶¶ 41–49), (2) directionality (¶¶ 34–40), and (3) reverse causality (¶¶ 6–33). Dr. Bajaj’s discussions of (1) and (2) are entirely duplicative. I address only Dr. Bajaj’s discussion of (3).

potential for reverse causality. First, the Notes traded on an over the counter market between 6 a.m. and 5 p.m. *See* Bajaj Decl. at ¶ 9. If Dr. Tabak had removed all stories during those trading hours, his test results become less favorable for the Notes. *See id.*; Exs. 2a, 2b to Bajaj Decl., Doc. No. 678-8, at 41–42. Second, Dr. Tabak’s approach does not eliminate the possibility that price changes caused the increased news because (a) post-close stories might be driven by earlier price increases, (b) there is limited pre-open and post-close trading on the NYSE, and (c) the ADS traded on the Tel Aviv Stock Exchange (the “TASE”), which trades (in part) when the NYSE is not trading. *See* Bajaj Decl. at ¶¶ 16–17.

Dr. Bajaj performed another manipulation of Dr. Tabak’s rebuttal test. Whereas Dr. Tabak examined the relationship between post-close, pre-open news and the price movement of Teva Securities in the subsequent trading period, Dr. Bajaj examined the relationship between the same news and the price movement of Teva Securities during the *previous* trading period. *See* Bajaj Decl. at ¶ 22. Dr. Bajaj argues that there should be no statistically significant correlation between the two; but Dr. Bajaj claims that, in fact, there is one. *See id.* at ¶¶ 23–25, 27. Dr. Bajaj concludes that, “[s]ince stories could not possibly ‘cause’ price changes on the prior day,” his results indicate that there is still a possibility of reverse causation present in Dr. Tabak’s revised test. *Id.* at ¶ 25.

This is the Defendants’ strongest critique of Dr. Tabak’s tests, but it is still not particularly concerning. There may be some reverse causality present in Dr. Tabak’s results. Indeed, Dr. Tabak acknowledged that Dr. Bajaj’s criticism was a “potentially relevant theoretical critique.” Tabak Rebuttal Report at ¶ 100. Dr. Tabak’s revised tests alleviate those concerns, at least in part. By re-defining *DJN* news days as days with news stories published only outside NYSE trading hours, Dr. Tabak significantly reduced the possibility that price changes were

causing the news. It is thus significant that Dr. Tabak's test results remained substantially the same. *See* Exs. 4a, 4c to Tabak Rebuttal Report, Doc. No. 656-10, at 178–85; Tabak Rebuttal Report at ¶ 94.

Dr. Bajaj's critiques—both of Dr. Tabak's original tests and his revised tests—are not entirely without merit. For instance, when Dr. Bajaj identified February 1, 2017—a day on which 86 percent of the observed statistically significant excess return occurred before the trading day's first news story—Dr. Tabak merely retorted that the example “proves little” because of its low power and the possibility of news leakage, *see* Tabak Rebuttal Report at ¶¶ 153–54, 158a. In addition, Dr. Bajaj raises legitimate issues with Dr. Tabak's revised test, including the facts that: (1) the Notes traded on an over the counter market between 6 a.m. and 5 p.m., (2) post-close stories might be driven by earlier price increases, (3) there is limited pre-open and post-close trading on the NYSE, and (4) the ADS traded on the TASE.

But I do not find Dr. Bajaj's various manipulations and simulations of Dr. Tabak's data particularly convincing. *See* Bajaj Report at ¶¶ 93–106; Bajaj Decl. at ¶¶ 22–27. In my view, Dr. Bajaj's tests bear little resemblance to Dr. Tabak's tests because Dr. Bajaj changes so many fundamental assumptions and relationships among data. *Cf.* Tabak Rebuttal Report at ¶ 101 n.82 (arguing that Dr. Bajaj's simulation was “set up to fail” based on “obviously unreasonable and unrealistic” assumptions).

Dr. Tabak's tests are not entirely free of potential reverse causality, but I do not agree with the Defendants that it is “just as likely” that price movements—as opposed to material news events—caused increased numbers of news stories. *Cf. id.* at ¶ 92 n.81 (calling Dr. Bajaj's claim a “statistically naïve statement”). Although I do not take Dr. Tabak's tests results fully at face

value, I discount them only slightly because of the possibility of reverse causality. Dr. Tabak's *Cammer* 5 tests still weigh heavily in favor of market efficiency for all the Teva Securities.

v. Classification of News Days

The Defendants argue that Dr. Tabak's news selection methodology is problematic in two ways. First, Dr. Tabak defines *DJN* news days without evaluating the content of the news stories themselves, and so Dr. Tabak has no way of knowing that all the *DJN* news days contain material, new, unexpected information. *See* Bajaj Report at ¶¶ 76–84, 98 (identifying news days with stories that, in Dr. Bajaj's view, contained only immaterial or stale information and commenting that Dr. Tabak's "purported 'objective' measure [for identifying news] is not a sound substitute for an economist's reasoned judgment"); McConnell Report at ¶ 59 ("[A]s Dr. Tabak has acknowledged, the z-test methodology for testing market efficiency is susceptible to misclassification of news and non-news days."). In the Defendants' view, that is a demerit because Dr. Tabak needed to test whether material, new, unexpected information caused price changes in the Teva Securities. Second, Dr. Tabak's Earnings Announcements test exhibits "look-ahead" bias³² because "extensive literature" establishes that "stock prices experience significant increases in volatility in response to earnings announcements." McConnell Report at ¶¶ 52, 54. As a result, "Dr. Tabak knows in advance that it is highly likely that Teva's security prices will exhibit significant price changes . . . on earnings announcement days." *Id.* ¶¶ 54–55 (making the same point with respect to Dr. Tabak's inclusion of corrective disclosure dates).

The Plaintiffs see things differently. Regarding *DJN* news days, Dr. Tabak readily concedes that he did not examine the content of the *DJN* news stories (except to ensure that they did not report solely on price changes). Dr. Tabak also concedes that his hands-off classification

³² "A look-ahead bias is a type of bias that occurs when a study or simulation relies on data or information that is not yet available or known during the study." Tabak Rebuttal Report at ¶ 67 (cleaned up).

system likely results in some misclassification of news and non-news days. But those misclassifications bias the test results *against* price responsiveness because of attenuation bias: “[E]rrors in classification will make the two groups tend to look more similar and make that distinction harder to see.” Tabak Rebuttal Report at ¶¶ 74–75, 147–51. Regarding the Earnings Announcements test, Dr. Tabak argues that—contrary to Dr. McConnell’s view—testing price responsiveness on earnings announcement dates does not exhibit look-ahead bias. Dr. Tabak notes that relying on “already existing academic studies of earlier data” to help determine what sets of days to test is “not at all problematic.” Tabak Rebuttal Report at ¶ 67. It does not “rel[y] on data or information that is not yet available or known during the study.” *Id.* The Plaintiffs also point out that many other courts accept *Cammer* 5 testing based on earnings announcement days. *See Villella*, 333 F.R.D. at 53 (citing *Cammer*, 711 F. Supp. at 1287).

In my view, Dr. Tabak’s hands-off news classification methodology is a virtue of his tests. It is a good thing that Dr. Tabak does not screen for materiality on the front end. *See In re Countrywide*, 273 F.R.D. at 618 & n.97 (explaining that “the events for study should be selected using criteria that are as objective as possible” and that “[o]ne way to minimize subjectivity is to define the event *ex ante* by criteria that are as objective as possible under the circumstances”). As explained above, Dr. Tabak’s news classification system gives me confidence that Dr. Tabak has not intentionally (or unconsciously) influenced the outcome of his test results. In my view, Dr. Bajaj is incorrect when he claims that Dr. Tabak’s “purported ‘objective’ measure [for identifying news] is not a sound substitute for an economist’s reasoned judgment.” Bajaj Report at ¶ 98. Dr. Bajaj’s proposal—that an economist handpicks event dates—would clearly inject more subjectivity into the process.

No matter what date classification methodology an expert uses, there is likely to be some subjectivity involved. Courts recognize that reality, and, in the normal course, do not discount or exclude *Cammer* 5 event studies based on that fact. *See, e.g., McIntire*, 38 F. Supp. 3d at 429 (rejecting *Daubert* challenge based on similar date selection methodology and noting that “an expert who is conducting an event study necessarily must use his or her discretion to define selection criteria that are conducive to the execution of a meaningful multivariate regression analysis”); *Petrobras I*, 312 F.R.D. at 368 (“There is always some subjectivity in analyses of this nature, and courts would be unable to rely on expert testimony if they could not tolerate a modest level of subjectivity.”). In my view, Dr. Tabak’s analysis is more objective than many other event studies, in which experts single out event dates *ex ante*.

Finally, there is nothing to the Defendants’ argument that Dr. Tabak should not have conducted the Earnings Announcements test. The fact that academic literature demonstrates that stock price volatility often increases on earnings announcement dates does not provide a reason not to test earnings announcement dates. In fact, it provides a good reason to do so: If securities do *not* pass the Earnings Announcements test, that might be significant in certain circumstances. Further, Dr. Tabak did not conduct *only* Earnings Announcements tests in this case. Thus, the Earnings Announcements test results are merely one aspect of Dr. Tabak’s overall analysis. Many courts accept earnings announcement dates as a proper news set for *Cammer* 5 testing. *See, e.g., Carpenters*, 310 F.R.D. at 80 (explaining that, in general, “[a]n event study has four parts: defining the event (*e.g.*, an earnings announcement) . . .”); *In re NII Holdings*, 311 F.R.D. at 411; *Monroe Cty. Emps.’ Ret. Sys. v. Southern Co.*, 332 F.R.D. 370, 385 (N.D. Ga. 2019) (“Neither Defendants nor [their expert] challenge [the Plaintiffs’ expert’s] selection of earnings announcements as event dates.”); *Pearlstein v. BlackBerry Ltd.*, 2021 WL 253453, at *17

(S.D.N.Y. Jan. 26, 2021). In sum, I view Dr. Tabak’s news classification methodology as a reason to give his analysis more weight, not less.

vi. Deviations from Prior Methodology and Inconsistencies

The Defendants argue that in this case Dr. Tabak deviated from his prior methodology in important ways. The Plaintiffs argue that none of those “deviations” is noteworthy.

First, in the FDT Article, Dr. Tabak and his co-authors wrote that corrective disclosure dates should be excluded from news days in an FDT test because “plaintiffs would normally choose a class period where corrective disclosures coincide with large negative price movements,” and so “including those days in the analysis would bias the results.” FDT Article, Doc. No. 508-5, at 41 n.155. But, the Defendants point out, in the *DJN* tests in this case, Dr. Tabak included 13 corrective disclosure dates. When those dates were removed from the relevant news categories, the tests’ results became much less favorable to the Plaintiffs. *See* Bajaj Report at ¶¶ 109–11.

Dr. Tabak acknowledges that the FDT Article “was a little confusing, maybe even miswritten, when it says to exclude corrective disclosure dates.” Tabak Depo. Tr., Ex. 6 to Defs.’ Class Cert. Opp’n, Doc. No. 507, at 122:25–23:3. Since the FDT Article was published in 2004, Dr. Tabak has clarified that the only corrective disclosure date that a tester should exclude is the final day of a class period. *See* Tabak 2016 Article at 2 n.5 (explaining that it would be “contrary to proper statistical technique” to include “the event ending the class period” because “its inclusion would have been driven, at least in part, by the fact that there was an associated stock-price movement”). The reason for doing so is to avoid selection bias:³³ The final day of a class period invariably coincides with a corrective disclosure because plaintiffs’ counsel

³³ Selection bias is “[s]ystematic error due to nonrandom selection of subjects for study.” Reference Manual on Sci. Evid. at 296.

normally chooses to end a class period on a day with “both news and a substantial decline in the price of at least one of the securities at issue.” Tabak Rebuttal Report at ¶ 129. In contrast, there is no selection bias issue with testing all days within a class period because plaintiffs’ counsel cannot choose what days are included within a class period. *See id.* at ¶ 130. In fact, excluding certain days within a class period based on the tester’s notion of when corrective disclosures occurred would almost certainly introduce an element of look-ahead bias because “[t]he only way to know to remove” those days “would be to read the complaint and discover that those dates were already described as corrective disclosures (and often described as being associated with large price declines).” *Id.* at ¶¶ 130–32.

Second, in the FDT Article, Dr. Tabak advocated using “unpooled” variance³⁴ in the FDT test. *See* FDT Article, Doc. No. 508-5, at 43 n.158 (“The test examines whether the means of two samples with potentially different variances are the same . . .”). But in this case, Dr. Tabak used the “pooled” variance, which assumes that both sets of data (the news set and the non-news set) have common variability. The Defendants claim that that difference renders Dr. Tabak’s z-statistic computations incorrect and biases his findings towards efficiency. *See* Defs.’ Class Cert. Opp’n, Doc. No. 508, at 28; Bajaj Report at ¶¶ 112–13. Although Dr. Tabak does not explain why he and his co-authors initially advocated using an unpooled variance to calculate the z-statistic, Dr. Tabak explains that, since the FDT Article was published, he has begun using a pooled variance in his FDT tests. *See* Tabak Report at ¶ 45 n.29 (“A test of proportions implicitly assumes equal variances under the null hypothesis, an update in methodology that I have used in prior cases.”); Tabak Depo. Tr., Ex. 6 to Defs.’ Class Cert. Opp’n, Doc. No. 507, at

³⁴ In calculating a z-statistic, “[s]tandard statistical textbooks . . . describe two methods.” Bajaj Report at ¶ 112. Those involve using either “pooled” or “unpooled” variance. “Where the variances of the two samples are not assumed to be equal, it is appropriate to use the unpooled variance in the requisite calculation.” *Id.* In contrast, when the variances of the two samples *are* assumed to be equal, it is appropriate to use the pooled variance.

120:23–22:18. Dr. Tabak updated his methodology because a pooled variance is consistent with the FDT test’s null hypothesis: If news actually does not matter, then there should be no differential price movements in the news and non-news sets. *See* Tabak Rebuttal Report at ¶¶ 124–26.

Third, in past cases Dr. Tabak has identified *DJN* (or equivalent) news days to be days on which news stories mentioned the defendant company in the title or first paragraph. *See* Bajaj Report at ¶ 51. Dr. Tabak did not use that limitation here. Dr. Tabak admits that, “in most of [his] cases,” he defines *DJN* news days as days when the defendant company is mentioned either in an article’s title or first paragraph. *See* Tabak Depo. Tr., Ex. 6 to Defs.’ Class Cert. Opp’n, Doc. No. 507, at 220:14. Dr. Tabak did not “remember the particular reason” he used a different approach here. *Id.* at 219:14–15. To ensure that that “deviation” did not affect test results in this case, Dr. Tabak re-ran his z-tests and K-S tests defining *DJN* news days as days on which *DJN* stories mentioned Teva in their title or first paragraph. The Teva Securities passed those tests with even stronger results. *See* Tabak Rebuttal Report at ¶ 142.³⁵

Finally, the Defendants point out that Dr. Tabak performed autocorrelation tests by year, but he did not do the same for the z-tests and K-S tests. Had he done so, those tests would have returned less significant results. *See* Bajaj Report at ¶ 114. Dr. Tabak explains that he tested for autocorrelation—but not price responsiveness to news—by year because “[t]here is an economic reason” to do so. Tabak Rebuttal Report at ¶ 159. More specifically, as described above, “if a pattern [of autocorrelation] is not stable over time, it may not be exploitable.” *Id.* at ¶ 160.

Testing for autocorrelation by year can reveal whether autocorrelation observed over the entirety

³⁵ The ADS and Preferred Shares passed all four z-tests. *See* Exs. 5a-a, 5a-b to Tabak Rebuttal Report, Doc. No. 656-10, at 186–87. The Notes not only all passed the Top 10% test, but they also all passed the Top 50% test. *See* Ex. 5a-c to Tabak Rebuttal Report, Doc. No. 656-10, at 188–89. When temporally limiting news to stories published outside of NYSE trading hours, those results are the same. *See* Exs. 6a-a, 6a-b, and 6a-c to Tabak Rebuttal Report, Doc. No. 656-10, at 196–99.

of a class period was consistent and predictable, such that an investor might have exploited it. When testing for price responsiveness to news, that reason simply does not exist. *Id.* at ¶ 161. Even so, Dr. Tabak performed further z-tests for the ADS and the Preferred Shares broken down into sub-periods, and the results were substantially the same.³⁶

In my view, none of the “deviations” or inconsistencies that the Defendants identify is significant. In fact, none of them is a “deviation”: Not even the Defendants claim that Dr. Tabak did anything for the first time in this case. *See, e.g.,* Pls.’ *Daubert* Opp’n, Doc. No. 686, at 18 n.9 (citing previous expert reports in which Dr. Tabak has (1) included corrective disclosure dates as event dates and (2) used the pooled variance for z-testing). It is unsurprising that Dr. Tabak has changed the way that he conducts the FDT test in the 17 years since the FDT Article was published.

Regarding the inclusion of corrective disclosures, I accept Dr. Tabak’s reasoning for including corrective disclosure dates (other than the last date of the Class Period). Removing those dates would introduce “look-ahead” bias because the tester would remove dates based (most likely) upon information gleaned from the complaint. *See* Tabak Rebuttal Report at ¶¶ 130–32. Further, other courts have remarked that the inclusion of corrective disclosure dates in a *Cammer* 5 event study is not necessarily problematic. *See, e.g., Willis v. Big Lots, Inc.*, 2017 WL 1074048, at *4 (S.D. Ohio Mar. 17, 2017) (“That the objective criterion incorporated corrective disclosure dates does not undermine the reliability of the methodology employed in the event study.”); *W. Palm Beach Police Pension Fund v. DFC Glob. Corp.*, 2016 WL 4138613, at *13 (E.D. Pa. Aug. 4, 2016) (holding that plaintiffs were entitled to *Basic* presumption when, in part,

³⁶ Dr. Tabak broke down the testing periods by year and into pre- and post-Actavis acquisition periods. Dr. Tabak performed only an Earnings Announcements z-test. The ADS and Preferred Shares passed each test, except that the Preferred Shares did not pass for the partial year 2018. *See* Ex. 7 to Tabak Rebuttal Report, Doc. No. 656-10, at 204.

the plaintiffs' expert's report "include[d] data to support the conclusion that abnormal returns were experienced on dates that included corrective disclosures").

With respect to the use of "pooled" rather than "unpooled" variance, I also accept Dr. Tabak's explanation. It makes sense that Dr. Tabak used the pooled variance (which assumes that the news and non-news sets will have common variability) in his tests because doing so was consistent with his null hypothesis (that news did not affect security prices).

Insofar as the Defendants note that Dr. Tabak has, in the past, defined *DJN* (or equivalent) news days to be days with news stories that mentioned Teva in the title or first paragraph, they have identified, at best, only an honest mistake. In any event, when Dr. Tabak re-ran his tests using that more restrictive definition of news days, his results only strengthened. *See* Tabak Rebuttal Report at ¶ 142; *supra* n.35. Similarly, the Defendants' observation that Dr. Tabak performed autocorrelation tests—but not security price responsiveness tests—by year does not raise a genuine concern. I agree with Dr. Tabak that there was no independent economic reason for him to do so, and, in any event, when Dr. Tabak re-ran those tests, the results were substantially the same. *See supra* n.36.

c. Summary

As described above, the "indirect" indicia of market efficiency strongly support the notion that the markets for all the Teva Securities were efficient. In my view, Dr. Tabak's *Cammer* 5 tests only bolster that conclusion. As discussed, not all of the Defendants' gripes are trivial, but none of them raises a substantial issue that affects my conclusion.

To sum up: Dr. Tabak's *Cammer* 5 tests support market efficiency especially strongly for the ADS and the Preferred Shares. The ADS and Preferred Shares passed all Dr. Tabak's original z-tests and K-S tests. The results for the Notes are less convincing on their face, but

they are still strong. The Notes all passed the Top 10% tests. In addition, four of the Notes passed the Earnings Announcements tests. As already noted, it is unsurprising that the same news might have had less of an impact on bond prices than on equity prices. Because bonds' upside is limited by their terms, good news might not affect their prices. And because bonds are senior to equity, bad news might not affect bond prices until the news is bad enough that a risk of default arises. See Tabak Report at ¶ 51; *In re Enron*, 529 F. Supp. 2d at 749; *In re Countrywide*, 273 F.R.D. at 615; Macey & Miller, *Good Finance, Bad Economics*, at 1085. Mindful of the differences between the bond markets and equity markets, I conclude that Dr. Tabak's tests also provide strong support for the Notes' market efficiency.

3. Defendants' *Daubert* Motion³⁷

The Defendants' *Daubert* motion is essentially duplicative of their opposition to class certification. That repetitiveness emphasizes two important points. First, the Defendants' challenge mostly involves attempting to discredit Dr. Tabak's *Cammer* 5 analysis. As I have explained, I view that effort as slightly misguided because my analysis is "holistic" and, in this case, the indirect *Cammer* and *Krogman* factors provide strong indications of market efficiency. Second, nearly all of the Defendants' gripes with Dr. Tabak's tests regard the weight I should afford the results, rather than their admissibility. As already discussed, the FDT test is an "application of a commonly used statistical technique." *Petrobras I*, 312 F.R.D. at 369; cf. Reference Manual on Sci. Evid. at 214 (explaining that because "most statistical methods relied on in court are described in textbooks or journal articles and are capable of producing useful

³⁷ The Plaintiffs argue that the Defendants' *Daubert* motion was improper because it should have been filed during the time allotted for class certification briefing. In their support, the Plaintiffs cite (1) *Fort Worth Emps.' Ret. Fund v. J.P. Morgan Chase & Co.*, 301 F.R.D. 116, 127–28 (S.D.N.Y. 2014), and (2) *Lumen v. Anderson*, 280 F.R.D. 451, 461–62 (W.D. Mo. 2012). In both *Fort Worth* and *Lumen*, the courts noted the impropriety of the Defendants' *Daubert* motions, but proceeded to consider them on the merits, at least partially. Similarly, although I agree that the proper time for the Defendants to have submitted their *Daubert* motion was with their opposition, I will consider it as part of my "rigorous analysis."

results when properly applied, . . . [o]ften . . . the battle over statistical evidence concerns weight or sufficiency rather than admissibility”). In analogous circumstances, courts have noted that similar challenges to an FDT test were “appropriately considered [] as part of the Court’s analysis of the merits of Plaintiffs’ motion for class certification” even though the arguments were “styled . . . as part of a motion to strike expert testimony.” *McIntire*, 38 F. Supp. 3d at 430. Nevertheless, I address the arguments in the Defendants’ *Daubert* motion here.

The Defendants do not contest Dr. Tabak’s qualifications. Dr. Tabak has B.S. degrees in economics and physics from the Massachusetts Institute of Technology and M.A. and Ph.D. degrees in economics from Harvard University. *See* Tabak Resume, Doc. No. 419-5, at 35–36. Since obtaining his Ph.D., Dr. Tabak has worked at NERA Economic Consulting. *See id.* at 36. Dr. Tabak has published many articles—including some in peer-reviewed journals—and given numerous presentations. *See id.* at 54–59. Dr. Tabak has also provided scores of expert reports and has testified extensively. *See id.* at 38–53. The Plaintiffs point out that Dr. Tabak testifies “on behalf of both defendants and plaintiffs” and that his “opinions have never been excluded by any court.” *See* Pls.’ *Daubert* Opp’n, Doc. No. 686, at 6–7. As discussed, numerous courts refer to Dr. Tabak as an expert on market efficiency testing in securities cases. Dr. Tabak’s education and experience qualify him to opine on market efficiency in this matter.

The Defendants also do not seriously contest that Dr. Tabak’s expert reports and potential testimony are irrelevant. The Defendants’ only potential challenge to relevancy is a half-hearted argument that Dr. Tabak’s tests do not address “whether Teva securities traded in an efficient market.” *Daubert* Mem., Doc. No. 678-1, at 18. The Defendants miss the mark. Dr. Tabak’s expert reports are relevant to establishing market efficiency: Dr. Tabak discusses all five *Cammer* factors, all three *Krogerman* factors, and several other indicia of market efficiency.

Insofar as the Defendants' argument regards Dr. Tabak's *Cammer* 5 event study, I have already explained that the FDT test is not—and need not be—a standalone test for market efficiency. Instead, the FDT test examines price responsiveness to news. An event study that examines price responsiveness to news is clearly relevant to determining market efficiency. *See Cammer*, 711 F. Supp. at 1287. Thus, Dr. Tabak's tests are relevant.

The Defendants claim that Dr. Tabak's tests are unreliable because they (1) were not grounded in sufficient data, (2) were applied unreliably, and (3) depend on unreliable methods. Regarding (1), the Defendants simply reiterate their argument that in classifying news days, Dr. Tabak “did not identify material, unexpected news” and “did not even review the news articles on which he bases his opinions.” *Daubert* Mem., Doc. No. 678-1, at 13. But there is no requirement that Dr. Tabak begin his event study by sifting through the content of news stories. And, as I have already explained, I view Dr. Tabak's news selection methodology as a virtue of his tests. *See In re Countrywide*, 273 F.R.D. at 618 & n.97. Regarding (2), the Defendants renew their attacks regarding (a) the potential for reverse causality, and (b) the alleged “deviations” from Dr. Tabak's prior approaches. *See Daubert* Mem., Doc. No. 678-1, at 25–30; Defs.' *Daubert* Reply, Doc. No. 696, at 12–13. I have already fully addressed the Defendants' reverse causality arguments. Although those arguments are not meritless, they do not render Dr. Tabak's tests inadmissible. Rather, they provide good fodder for “[v]igorous cross examination” and “presentation of contrary evidence.” *Daubert*, 509 U.S. at 596. I have also already explained why I do not discount Dr. Tabak's results—and much less will I exclude them as unreliable—based on alleged “deviations” from his prior methodology.

Regarding (3), the Defendants also recycle several of the arguments that they have already made. For instance, the Defendants argue that Dr. Tabak's tests in this case were

“retrofitted for this specific litigation” because Dr. Tabak did not remove corrective disclosure dates from his event study and because he used the pooled, rather than unpooled, variance. *Daubert* Mem., Doc. No. 678-1, at 15–16. I already explained why neither of those observations detract from the weight I afford Dr. Tabak’s results, and they also do not render Dr. Tabak’s tests inadmissible. The Defendants also reassert that the FDT test is not generally accepted by financial economists and lacks meaningful peer review. *See id.* at 18–24. Here, the Defendants downplay the importance of the Villanueva Article and distinguish the articles that Dr. Tabak cites as support for various underpinnings of the FDT test. For the reasons described above, I do not find the relative lack of peer review to be an important factor in determining the reliability of Dr. Tabak’s test. *Cf. Kumho Tire*, 526 U.S. at 141 (noting that “*Daubert*’s list of specific factors neither necessarily nor exclusively applies to all experts or in every case”).

The Defendants also claim that Dr. Tabak’s tests are unreliable for two “new” reasons. The first is that the FDT test is a “made-for-litigation methodology.” *Daubert* Mem., Doc. No. 678-1, at 14–15. That argument is unpersuasive for the same reasons as the Defendants’ arguments regarding the lack of peer review. More specifically, the FDT test was created for litigation because the applicable legal standard often requires plaintiffs to prove market efficiency for a single firm’s securities. Plaintiffs primarily use event studies—rather than academic theories or literature—to do so. *See Waggoner*, 875 F.3d at 94; Brav & Heaton, *Event Studies*, at 587 (explaining that the single-firm event study “methodology is applied [] infrequently in peer-reviewed research”). The FDT test is a version of an event study. The fact that it was made for use in litigation does not, under the circumstances, make it unreliable. *See McIntire*, 38 F. Supp. at 430–431 (rejecting *Daubert* challenge to version of FDT test).

Second, the Defendants argue that Dr. Tabak's tests have no known error rate because they "are consistent with market *inefficiency*." *Daubert* Mem., Doc. No. 678-1, at 24–25.³⁸ That is: "[H]ow often is Dr. Tabak wrong to conclude that a stock that reacts only sometimes to news is trading in an efficient market[?]" Defs.' *Daubert* Reply, Doc. No. 696, at 11. According to the Plaintiffs, the fact that Dr. Tabak's *Cammer* 5 test results can be consistent with market inefficiency "is merely a criticism that the testing is not perfect, which applies to any statistical test." Pls.' *Daubert* Opp'n, Doc. No. 686, at 28. In fact, the Plaintiffs argue, Dr. Tabak's *Cammer* 5 test has a known error rate: Five percent, which is the "false positive" rate, equivalent to the level of statistical significance. *See* Reference Manual on Sci. Evid. at 300–01 ("A statistical test makes a Type I error when (1) the null hypothesis is true and (2) the test rejects the null hypothesis, i.e., there is a false positive."). In my view, the parties talk past each other because their definitions of the relevant "error rate" are not the same. The Plaintiffs focus exclusively on Dr. Tabak's *Cammer* 5 test; the Defendants focus on how often a security that passes Dr. Tabak's *Cammer* 5 tests actually traded in an inefficient market. The Defendants' conception of "error rate" is erroneous because it is a legal question whether a particular security traded in an efficient or inefficient market. Even if Dr. Tabak could calculate that "error rate" based on how judges have ruled in the past, it would be irrelevant to determining the admissibility of Dr. Tabak's tests. I will not exclude Dr. Tabak's tests on that basis.

Finally, the Defendants cite three cases in which courts have "exclude[d] market efficiency opinions based in whole or in part o[n] Dr. Tabak's methodology." *Daubert* Mem.,

³⁸ The Defendants also comment that "Dr. Tabak's unusual date selection methodology" has a high "error rate." *Daubert* Mem., Doc. No. 678-1, at 25. The Defendants cite Dr. Bajaj's "simulations" that claimed to show "that the false-positive error rates of Dr. Tabak's Dow Jones Newswires Top 50% and Top 10% tests were 89.9% and 98.9%, respectively for the Tabak z-test and 79.1% and 90.6%, respectively for the Tabak KS tests." *Id.* In my view, that argument does not regard an "error rate" in the relevant sense. I have already explained that I do not find Dr. Bajaj's simulations particularly convincing and that I view Dr. Tabak's news classification methodology as a virtue.

Doc. No. 678-1, at 30. Those cases are: (1) *IBEW Local 90 Pension Fund v. Deutsche Bank AG*, 2013 WL 5815472 (S.D.N.Y. Oct. 29, 2013); (2) *In re Fed. Home Loan Mortg. Corp. (Freddie Mac) Sec. Litig.*, 281 F.R.D. 174 (S.D.N.Y. 2012); and (3) *Ohio Pub. Emps. Ret. Sys. v. Fed. Home Loan Mortg. Corp. (“OPERS”)*, 2018 WL 3861840 (N.D. Ohio Aug. 14, 2018).

In *IBEW*, the court granted the defendants’ *Daubert* motion to exclude the opinions of plaintiffs’ expert, who had performed a version of a z-test. 2013 WL 5815472 at *6, *12. First, the court held that the plaintiffs’ expert was unqualified because his “expertise is being an expert in plaintiffs’ securities cases.” *Id.* at *2, *13–15. Indeed, the plaintiffs’ expert had no graduate degree in any field and had never written an article in any area of financial markets or market efficiency. *Id.* at *2. The court was also “singularly unimpressed with [the plaintiffs’ expert’s] in-court testimony” because he was “evasive in answering questions when such answers were inconvenient.” *Id.* at *15. Second, the court held that, even if the plaintiffs’ expert had been qualified, his methodology was flawed. Most importantly, he “fail[ed] adequately to account for the fact that over 90% of [the relevant securities] traded in a market other than the one he studied (and indeed, outside the U.S.)” and simultaneously conceded that “German pricing drove U.S. pricing.” *Id.* Further, the plaintiffs’ expert did not “account for the particular circumstances impacting financial institutions during the financial crisis,” and his choice of inputs “ma[de] little sense.” *Id.* at *16. Finally, the court “credit[ed] the testimony” of the defendants’ expert that the plaintiffs’ expert’s “regression was not performed according to reliable methodology.” *Id.*

In *Freddie Mac*, the plaintiffs’ expert submitted two event studies. 281 F.R.D. at 179–80. The first “contained several significant errors,” including important miscalculations and the inclusion of dates that were outside the class period. *Id.* at 179. In the second study, the plaintiffs’ expert “changed his methodology” and conducted a version of the FDT test. *Id.* In

denying the plaintiffs’ motion for class certification, the court wrote: “I question [the plaintiffs’ expert’s] use of these tests for the first time in a second and inconsistent event study.” *Id.* at 180. The court also noted that the plaintiffs’ expert’s “analysis changed so many times in important ways and was so internally inconsistent that I found it unreliable and unpersuasive.” *Id.* at 181.

In *OPERS*, the court granted the defendants’ *Daubert* motion. The plaintiffs’ expert conducted a z-test in which he identified just nine news days out of a class period of 330 trading days. 2018 WL 3861840, at *5. None of those news days was within the first five months of the class period. *See id.* The court rejected the z-test primarily because it “was based on an insufficiently small sample.” *Id.* The court also wrote, without elaborating: “[T]he z-test conducted by [the plaintiffs’ expert] is unreliable due to numerous other fundamental design problems that infect it.” *Id.* at *6. Later, the court seemed to suggest that those “design problems” were “sample size and limited events.” *Id.* at *17. The court also noted, without analysis, that a z-test “is not a peer-reviewed process that economists accept as a method to establish market efficiency.” *Id.* at *5 n.4. The plaintiffs’ expert had also conducted a “single-date, last day of the putative Class Period event study.” *Id.* at *2. Relying in part on the FDT Article and the Tabak 2016 Article, the court rejected that study because of its low sample size. *Id.* at *2–4.

Each of the above cases—none of which involved Dr. Tabak—is distinguishable, and none can bear the weight that the Defendants ask it to shoulder. Unlike the expert in *IBEW*, Dr. Tabak has not failed to consider vitally important information. Also unlike the expert in *IBEW*, Dr. Tabak comes across—in both his reports and depositions—as thoughtful and forthcoming.³⁹

³⁹ For instance, during his December 2020 deposition, Dr. Tabak essentially overruled plaintiffs’ counsel’s gratuitous objection so that he could answer what he thought to be an insightful economic question from defense counsel. *See* Tabak Depo. Tr., Ex. F to Defs.’ *Daubert* Mot., Doc. No. 678-7, at 171:11–16 (“Don’t object. That’s a

Unlike the expert in *Freddie Mac*, Dr. Tabak has not submitted an event study that “contained several significant errors” and has not submitted event studies based on different methodologies. *OPERS* is the case most critical of the z-test. But, in my view, the *OPERS* Court did not explain its reasoning beyond rejecting the test for small sample size. In this case, there is no suggestion that Dr. Tabak’s tests suffered from a small sample size.

For those reasons, I **deny** the Defendants’ *Daubert* motion that seeks to exclude Dr. Tabak’s opinions and to strike his expert reports.

D. Rule 23(b)(3) Predominance: Exchange Act Claims – Economic Loss

The parties dispute whether the Plaintiffs have shown that common questions of law or fact predominate over individual questions with respect to calculating economic loss arising from the Exchange Act claims. In most Section 10(b) and Rule 10b-5 cases, economic loss is determined by the “out-of-pocket” measure for damages. *See Acticon AG v. China North East Petroleum Holdings, Ltd.*, 692 F.3d 34, 38 (2d Cir. 2012) (explaining that out-of-pocket damages seek to ensure that “a defrauded buyer of securities is entitled to recover only the excess of what he paid over the value of what he got.”) (quoting *Levine v. Seilon, Inc.*, 439 F.2d 328, 334 (2d Cir. 1971)). So, too, in this case.

According to the Plaintiffs, out-of-pocket damages can be measured using a common methodology. *See* Tabak Report at ¶¶ 74–76. Dr. Tabak describes how he (or another expert) might calculate those damages at the appropriate time. First, the expert would conduct an event study to analyze “the change in the market prices of each Teva security, accounting for changes in market and/or industry effects, on the dates of (or the trading dates following) the corrective disclosures and materializations of the risk alleged in this case.” *Id.* at ¶ 77. In that first step, the

very good question because it points out the difference between my analysis . . . and Dr. Bajaj and Dr. McConnell’s analysis.”).

expert would disaggregate confounding information by “determin[ing] whether any of the information disclosed or negative events were unrelated to the alleged fraud.” *Id.* at ¶ 78. The expert would also consider whether “the amount of inflation decline[d] for reasons other than a corrective disclosure.” *Id.* at ¶ 76. Second, the expert would “determine the amount of artificial inflation in the price of Teva Securities for each day during the Class Period.” Pls.’ Class Cert. Mem., Doc. No. 419-1, at 41. And, third, the expert would apply that artificial inflation model “to each Class member’s transactions in a mechanical fashion . . . to determine the appropriate claim for each member of the Class.” Tabak Report at ¶ 79.

Numerous courts have certified classes asserting Section 10(b) and Rule 10b-5 claims based on an expert’s proposed use of that three-step analysis. *See, e.g., Wilson*, 2018 WL 3913115, at *17 (“Other courts in this district have found that this three-step model suffices at the class certification stage to show that the issue of damages does not preclude a finding that common issues of law and fact predominate over individual damages issues.”); *Petrobras I*, 312 F.R.D. at 371–72 (accepting plaintiffs’ expert’s “three-step damages methodology” and noting that “[i]t is not necessary . . . to resolve the detailed disputes over plaintiffs’ damages model at the class certification stage”).

Still, the Defendants claim that Dr. Tabak’s proposed methodology for calculating classwide damages cannot show that common issues will predominate over individual ones because Dr. Tabak does not explain how it would address the following three issues. First, the Defendants argue that the Price-Hike Strategy⁴⁰ was “pure fiction” because “information about increased drug prices—including Teva-specific information on the prices of individual drugs—was widely available during the Class Period.” Defs.’ Class Cert. Opp’n, Doc. No. 508, at 11,

⁴⁰ The “Price-Hike Strategy” refers to the Plaintiffs’ allegations that “the [D]efendants implemented a strategy to systematically raise generic drug prices across a large swath of Teva’s generic drug portfolio.” *Ontario Teachers’*, 432 F. Supp. 3d at 143 (cleaned up).

34–40; *see also* Expert Report of Christopher M. James, Doc. No. 508-4, at ¶¶ 32–78 (the “James Report”) (describing Teva’s public disclosures, “free-to-the-public . . . and commercially available” drug pricing databases, public discussion, and securities analyst coverage during the Class Period). Second, the Plaintiffs assert four theories of liability—(1) the Price-Hike Strategy, (2) denials of collusive conduct, (3) false statements regarding the competitiveness of the generic drug market, and (4) lies about the July 2015 Actavis merger—but do not explain how damages could be isolated accordingly. *See* Defs.’ Class Cert. Opp’n, Doc. No. 508, at 40–45; *see also* James Report at ¶¶ 79–107. And, third, the Defendants note that, as fixed-income securities, the Notes have “particular characteristics” and “price determinants.” Defs.’ Class Cert. Opp’n, Doc. No. 508, at 45–46; James Report at ¶¶ 108–16.

None of the Defendants’ claims has merit. The Defendants’ first and third arguments require little discussion. It is difficult to understand how the amount of information available to the market affects the commonality of issues pertaining to calculating economic loss. The Defendants do not attempt to explain it. To the extent that the Defendants actually seek to challenge price impact on that ground, I reject that challenge. I have already explained that I give substantial weight to the Plaintiffs’ evidence of market efficiency. In contrast, the Defendants’ evidence—based on Dr. James’s qualitative “review[of] Teva’s SEC filings, press releases, and conference call transcripts . . . which preceded the first alleged curative disclosure,” James Report at ¶ 35—is not nearly enough to show by a preponderance of the evidence “that the entire price decline on the corrective-disclosure dates was due to something other than the corrective disclosures.” *ARTS II*, 955 F.3d at 271 (citing *Waggoner*, 875 F.3d at 105). Further, to the extent that the Defendants actually seek to challenge materiality—*i.e.*, that the allegedly actionable misstatements and omissions were not material because the market knew the truth – I

have already rejected similar arguments at the motion to dismiss phase. See *Ontario Teachers' Pension Plan Bd. v. Teva Pharm. Indus., Ltd.*, 432 F. Supp. 3d 131 (D. Conn. 2019). In addition, the Second Circuit has recently confirmed that “while securities class action defendants have numerous avenues for challenging materiality, Rule 23 is not one of them.” *ARTS II*, 955 F.3d at 270. Finally, the fact that the Notes behave differently than the ADS and Preferred Shares is not surprising and “simply means that the analyses for the different securities will have to take” those differences into account.⁴¹ Tabak Rebuttal Report at ¶ 211.

The Defendants’ second argument—regarding the Plaintiffs’ alleged four theories of liability—is also misplaced. Primarily, the Defendants rely on *Comcast* for support. In *Comcast*, the Supreme Court reversed the lower courts’ certification of a Rule 23(b)(3) class alleging violations of federal antitrust laws. 569 U.S. at 38. Below, the plaintiffs had “proposed four theories of antitrust impact,” only one of which the district court accepted for certification because it was the only theory that was “capable of classwide proof.” *Id.* at 31. The plaintiffs had offered a damages model, though, that “did not isolate damages resulting from any one theory of antitrust impact.” *Id.* at 32. The Supreme Court held that the class was improperly certified because “[q]uestions of individual damage calculations will inevitably overwhelm questions common to the class.” *Id.* at 34. The Second Circuit has interpreted *Comcast* narrowly:

We have [] interpreted *Comcast* as precluding class certification only because the sole theory of liability that the district court determined was common in that antitrust action . . . was a theory of liability that the plaintiffs’ model indisputably failed to measure when determining the damages for that injury. In other words, we have stated that *Comcast* held that a model for determining classwide damages relied upon to certify a class under Rule 23(b)(3) must actually measure damages that result from the class’s asserted theory of injury.

⁴¹ Mindful of the differences between how debt and equity respond to news, I will examine the Plaintiffs’ damages claim with respect to the Teva Notes with a particularly discerning eye.

Waggoner, 875 F.3d at 105–06 (cleaned up); *see also Roach v. T.L. Cannon Corp.*, 778 F.3d 401, 407 (2d Cir. 2015); *Sykes v. Mel S. Harris and Assocs. LLC*, 780 F.3d 70, 82 (2d Cir. 2015). Thus, “*Comcast* does not mandate that certification pursuant to Rule 23(b)(3) requires a finding that damages are capable of measurement on a classwide basis.” *Roach*, 778 F.3d at 402. Indeed, class certification may be appropriate pursuant to Rule 23(b)(3) even in cases “involving individualized damages calculations.” *Id.* at 408.

Since *Comcast*, many courts have commented that the potential need for individualized damages calculations in Section 10(b) cases simply does not impose a high hurdle on Rule 23(b)(3)’s predominance requirement. *See, e.g., Strougo v. Barclays PLC*, 312 F.R.D. 307, 313 (S.D.N.Y. 2016) (“Issues and facts surrounding damages have rarely been an obstacle to establishing predominance in section 10(b) cases.”); *In re Barrick Gold Sec. Litig.*, 314 F.R.D. 91, 105–06 (S.D.N.Y. 2016) (“This oft-used remedy, which is calculated based on the difference between the price paid and the true value of the stock when bought, does not create individualized damages issues that defeat predominance.”) (cleaned up). Leading commentators agree. *See* 7 William B. Rubenstein, *Newberg on Class Actions* § 22:81 (5th ed.) (Westlaw 2021) (noting that “[s]ecurities class actions rarely have trouble complying with . . . *Comcast*’s insistence on a classwide methodology” and emphasizing that “it is a rare—perhaps even nonexistent—securities case that raises damages issues that are so individualized as to defeat the predominance of the critical common issues in the case”).

This case comfortably complies with *Comcast*. I agree with the Plaintiffs that there is one theory of liability: The Defendants’ misstatements and omissions regarding the reasons for their business success in the generics market caused the price of the Teva Securities to be artificially inflated during the Class Period. To be sure, the Defendants allegedly lied about

numerous different (yet intimately related) topics, such as their Price-Hike Strategy and the competitiveness of the generic drug market. But the Defendants' various misstatements and omissions were "part of a network of interrelated lies all collectively aimed at perpetuating a broader, material lie." *Ontario Teachers'*, 432 F. Supp. 3d at 174 (quoting *In re Vivendi, S.A. Sec. Litig.*, 838 F.3d 223, 250 (2d Cir. 2016)) (cleaned up). The Plaintiffs have shown that their proposed damages calculation methodology will actually measure damages that result from the proposed Class's asserted theory of injury. Thus, the Plaintiffs' model for classwide damages also supports the conclusion that common issues of law and fact will predominate over individual ones.

IV. Conclusion

For the foregoing reasons, the Plaintiffs' motion for class certification and appointment of class representatives and class counsel, doc. no. 419, is **granted**. The Defendants' *Daubert* motion to exclude the opinions and strike the reports of the Plaintiffs' expert, doc. no. 678, is **denied**. The certified class is defined as follows:

- (1) As to claims under the Securities Exchange Act of 1934, all persons and entities who, in domestic transactions, purchased or otherwise acquired the following securities during the period from February 6, 2014 through May 10, 2019, inclusive (the "Class Period"), and were damaged thereby:
 - a. Teva American Depositary Shares ("ADS");
 - b. Teva 7.00% mandatory convertible preferred shares issued on or about December 3, 2015 and January 6, 2016 ("Preferred Shares");
 - c. The following Teva Finance U.S.-dollar-denominated senior notes issued on or about July 21, 2016:
 - i. 1.400% Senior Notes due July 20, 2018 ("2018 Notes");
 - ii. 1.700% Senior Notes due July 19, 2019 ("2019 Notes");
 - iii. 2.200% Senior Notes due July 21, 2021 ("2021 Notes");

- iv. 2.800% Senior Notes due July 21, 2023 (“2023 Notes”);
 - v. 3.150% Senior Notes due October 1, 2026 (“2026 Notes”); and
 - vi. 4.100% Senior Notes due October 1, 2046 (“2046 Notes”) (collectively, the “Notes”); and
- (2) As to claims under the Securities Act of 1933, all persons and entities who, in domestic transactions, purchased or otherwise acquired ADS, Preferred Shares, and Notes pursuant or traceable to the offerings of ADS and Preferred Shares completed on or about December 3, 2015 and January 6, 2016, or the offering of the Notes completed on or about July 21, 2016; and as to the alleged additional state-law claims, all persons and entities who purchased or otherwise acquired ADS pursuant to Teva’s Employee Stock Purchase Plan for U.S. Employees (“ESPP”) during the Class Period, and were damaged thereby.⁴²

Ontario Teachers’ Pension Plan Board and Anchorage Police & Fire Retirement System are appointed Class Representatives. Bleichmar Fonti & Auld LLP is appointed Class Counsel. And Carmody Torrance Sandak & Hennessey LLP is appointed Class Liaison Counsel.

So ordered.

Dated at Bridgeport, Connecticut, this 9th day of March 2021.

/s/ STEFAN R. UNDERHILL
Stefan R. Underhill
United States District Judge

⁴² Excluded from the Class are: (1) Defendants and any affiliates or subsidiaries thereof; (2) present and former officers and directors of Teva, Teva USA, and Teva Finance, and their immediate family members (as defined in Item 404 of SEC Regulation S-K, 17 C.F.R. § 229.404, Instructions (1)(a)(iii) & (1)(b)(ii)); (3) Defendants’ liability insurance carriers, and any affiliates or subsidiaries thereof; (4) any entity in which any Defendant has or has had a controlling interest; (5) Teva’s employee retirement and benefit plan(s) (not including the ESPP); and (6) the legal representatives, heirs, estates, agents, successors, or assigns of any person or entity described in the preceding five categories.