What is Price Impact?
How the *Goldman* Decision is Reshaping Shareholder Class Actions

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Shareholder class actions now face greater court scrutiny at the certification stage in the wake of the U.S. Supreme Court's recent Goldman decision. In that case, the court instructed the Second Circuit to decertify a class due to a lack of price impact from the alleged misrepresentations. The court found a mismatch between overly generic alleged misrepresentations and highly specific corrective disclosures. The court also instructed lower courts to consider all record evidence relevant to price impact when considering class certification motions.

We show that this decision has significantly impacted the class certification process. The rate of defendant motions challenging price

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The authors wish to thank Parsa Aghel, Robert Chang, Alyse Corcoran, Conor Tosh, and Nicolas Tschuetscher for valuable research assistance.

impact has more than doubled from the pre-Goldman era to the present time. Moreover, the rate of class certification denials based on price impact arguments has also roughly doubled during the same time period. Thus, the ripple effects of the Goldman decision are being felt as parties now litigate more intensely over price impact questions.

However, we also document a lack of consensus in court opinions over a key question: What is price impact? We break down this question into two important aspects. First, we explain what is implied by a mismatch between alleged misrepresentations and corrective disclosures, and we raise some points of caution in relation to how some lower courts have been approaching this question in recent cases. Second, we explain the concept of statistical significance in relation to price impact. Here, we also highlight instances in which some courts have adopted a statistical standard that is inconsistent with the civil law burden of proof and Goldman's guidance to evaluate price impact relative to a preponderance of the evidence. We show that, consistent with recent academic research on single firm event studies, experts and courts should not evaluate the magnitudes of disclosure-driven price movements based on a 95% statistical significance requirement. Rather, we explain how single firm event study results should properly be interpreted as tests against price movements caused by random chance when assessing price impact under a preponderance of the evidence standard.

I. INTRODUCTION

[Shareholder class actions are widely viewed as a complement to regulatory enforcement of the securities laws…]

In Goldman Sachs Group v. Arkansas Teacher Retirement System, the plaintiffs, several pension funds, sought a securities-

fraud class action against the Goldman Sachs Group.[1] They alleged that Goldman's "generic" statements "were false or misleading in light of several undisclosed conflicts of interest," and they were thus defrauded when the truth of Goldman's conflicts came to light and the stock price suffered.[2] Securities fraud is, of course, premised on Section 10(b) of the Securities Exchange Act of 1934. Its implementing regulation, Rule 10(b)-5 prohibits "material misrepresentations and omissions" in connections with the sale of securities.[3] To do so, a plaintiff must show a "material misrepresentation or omission by the defendant and the plaintiffs' reliance on that misrepresentation or omission."[4] Showing both creates a rebuttable presumption that has "particular significance in securities-fraud class actions,"[5] as it makes it easier for plaintiffs to establish the predominance requirement that "questions of law or fact common to class actions."[6]

The allegations included several generic statements from Goldman's SEC filings, including a promise that "our clients' interests always come first."[7] Goldman, in fact, was engaged in several conflicted transactions that they had not disclosed—and the plaintiffs alleged that the news breaking about these conflicts led to a price drop for Goldman and shareholders to suffer losses.

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[1] Id.
[2] Id.
[3] 15 U. S. C. § 78j(b)
[4] Halliburton.
[5] Amgen Inc.
[6] Id.
[7] Goldman

Based on the defendant's raised issues,[8] the Court first held that the "generic nature" of a misrepresentation often will be important evidence of a lack of price impact."[9] The holding is critical. Plaintiffs often approach securities fraud actions with the "inflation-maintenance theory," which alleges that a misrepresentation buoys an artificially inflated stock price. They try to prove this by pointing to a corrective disclosure and point to its associated drop, arguing that the price drop is representative of the amount of inflation caused by the misrepresentation.[10]

The Court held that the presumption that a back-end price drop is tantamount to the front-end inflation breaks down when the misrepresentation and the corrective disclosure "mismatch."[11] If the earlier misrepresentation was "generic," in contrast to a "specific" corrective disclosure, it is "less likely" that the disclosure corrected the generic misrepresentation.[12]

Secondly, the Court reaffirmed that the defendants bear the burden of rebutting price impact.[13] This holding keeps in line with precedent stemming from Basic that "'any showing that severs the link' aligns more logically with imposing a burden of persuasion rather than a burden of production."[14] This paper

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[8] "Goldman argues that the Second Circuit erred in two respects: first, by concluding that the generic nature of alleged misrepresentations is irrelevant to the price impact question; and second, by placing the burden of persuasion on Goldman to prove a lack of price impact."
[9] Goldman
[10] In re Vivendi, S. A. Securities Litig., 838 F. 3d 223, 233–237, 253–259 (CA2 2016).
[11] Goldman
[12] Id.
[13] Upon a showing of a prima facie case by the Plaintiff.
[14] Waggoner v. Barclays PLC, 875 F. 3d 79, 99–104 (CA2 2017)

focuses on the questions left open after Goldman, namely, how can plaintiffs can demonstrate price impact and how defendants rebut price impact?

[Empirical findings: rate of price impact challenges has doubled from pre-Goldman era. These challenges have also caused the rate of class certification denials to roughly double.]

[Yet a review of the relevant lower court opinions reveals inconsistent approaches to the key question: What is price impact? Southern case: Defendants face a daunting task of proving no price impact. Goldman reaffirmed Defendants' burden. But it is time to take a step back and consider price impact given the varying approaches to evaluating it.]

[Explain mismatch and caution in approach to evaluating this.]

[Explain statistical significance of disclosure-driven price movements and reasonable steps courts and experts should take when evaluating this under a preponderance of the evidence. Event study is not required – see Partnoy DCF paper and Alphabet expert report (settled for $xxx million).]

[Statistical significance is a continuum, not a bright line. See Fisch, et al, Brav and Heaton, Baker, etc.]

[Key implication: we provide two approaches to considering price impact when relying on event studies, in light of a preponderance of the evidence standard. In other words, is the price movement more likely than not to have been caused by the disclosure versus random chance. First is to document whether the price drops on a corrective disclosure (or increases on misrepresentations) after controlling for market and industry

movements on the event date. Second is to consider the probability that the abnormal price change was caused by random chance. Here, as explained by prior academic work, 95% is not the required standard under civil law. Rather, 50% - *i.e.*, a p-value of 0.50 – is the appropriate standard.]

[Summary…]

II. BACKGROUND AND LITERATURE REVIEW

A. Shareholder Class Actions

To qualify for class certification, shareholder plaintiffs must prove that the proposed class action satisfies the four elements of Rule 23(a): numerosity, commonality, typicality, and adequacy of representation.[15] In addition, the plaintiffs must also show that the proposed class action can proceed under one of the categories of Rule 23(b). Most commonly, securities class actions proceed under Rule 23(b), where plaintiffs must show that the questions of law or fact common to class members "predominate over any questions affecting only class members,"[16] that the class action is the superior method for bringing their claim, and that the "proposed class is sufficiently ascertainable."[17]

Commonality often turns on proving that the plaintiffs had the same element of reliance.[18] In securities class actions, the reliance can be on either an omission or a false statement. When

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[15] Fed. R. Civ. P. 23(a)
[16] Fed. R. Civ. P 23(b)(3).
[17] Puddu v. NYGG (Asia) Ltd., No. 15CV8061 (DLC), 2022 WL 2304248, at *2 (S.D.N.Y. June 27, 2022), reconsideration denied, No. 15CV8061 (DLC), 2022 WL 2789250 (S.D.N.Y. July 15, 2022).
[18] Erica P. John Fund, Inc. v. Halliburton Co., 563 U.S. 804, 8210 (2011) ("Halliburton I").

based on an omission, reliance on the omission can be presumed from its materiality.[19] When based on misrepresentations rather than omissions, however, a plaintiff can create a "rebuttable presumption" of reliance through a "fraud-on-the-market theory."[20] To fashion this presumption, the plaintiff must demonstrate 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."[21]

Price impact is crucial to multiple sects of securities fraud actions. In Halliburton II, the court considered price impact in the context of determining the plaintiff's reliance on fraudulent statements, but it is also "critical" to loss causation, materiality, and damages. In Basic Inc., the court accepted the presumption that the only relevant inquiry in a securities fraud case was the "extent to which market prices were distorted by fraudulent information."[22] This developed into Cammer v. Bloom, which espoused a five factor test to determine whether the market is efficient, a component of fraud on the market litigation.[23] The fifth factor necessitates a "cause-and-effect relationship…between unexpected corporate events, or financial

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[19] Affiliated Ute Citizens of Utah v. United States, 406 U.S 128 (1972).
[20] Basic Inc. v. Levinson, 485 U.S. 224, 242 (1988).
[21] Halliburton Co. v. Erica. P. John Fund, Inc., 573 U.S. 258, 277-78 (2014) ("Halliburton II").
[22] For a more comprehensive understanding of the history of event studies, see Fisch 2018.
[23] 711 F. Supp. 1264 (D.N.J. 1989).

releases and an immediate response in stock price."[24] Though Basic and Cammer have been continually disputed,[25] the cases expanded the use of event studies, distancing securities fraud from tort fraud by introducing a market-based approach.

Event studies are now routinely used in evaluating the significance of price impact in securities litigation. Indeed, without an impact on the stock price, plaintiffs lack any grounds to prove that they were defrauded.[26]

In 2019, the Northern District of Georgia held that once a plaintiff shows entitlement to a presumption of reliance, the defendant is burdened with the "daunting task of proving that the publicly known statement had no price impact."[27] Defendants thus face a high burden in proving that alleged misstatements had "no price impact whatsoever" in order to rebut price impact.[28] The court held that "the existence of non-statistically significant stock price declines does not prove the *absence* of price impact."[29]

B. The Goldman Decision

In 2023, the Second Circuit reconsidered Goldman I following the Court's instruction for remand. [30] The court reaffirmed the Basic presumption that stock trading in an efficient market incorporates into its price all material information, which

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[24] Id.
[25] Fisch 560
[26] See Halliburton II, "in the absence of price impact, Basic's fraud-on-the-market theory and presumption of reliance collapse."
[27] 332 F.R.D. 370
[28] Id.
[29] Id.
[30] Arkansas Tchr. Ret. Sys. v. Goldman Sachs Grp., Inc., 77 F.4th 74 (2d Cir. 2023) (Goldman II).

includes "material misrepresentations," that investors rely on.[31] The court instructed that following Goldman I, courts are now directed to compare the "relative genericness of a misrepresentation with its corrective disclosure."[32] In Goldman I, Goldman's statements that "our client's interests always come first" and "we have extensive procedures and controls that are designed to identify conflicts of interest" was challenged by the disclosure that Goldman was betting on subprime mortgages to fall while touting various CDOs as long-term investment opportunities.[33]

Goldman proceeded to introduce an event study claiming to show that the business principles statements and conflicts disclosure did not cause a "significant uptick in Goldman's stock price."[34] Goldman identified 36 dates prior to the corrective disclosure dates, where media outlets "raised questions about Goldman's ability to manage conflicts of interest."[35] Goldman claimed that these 36 instances were "alternative corrective disclosures" that did not cause a "statistically significant decrease."[36] As a result, Goldman alleged that the price drop that did occur could not have been related to the original misrepresentations the plaintiffs allege. The Second Circuit did not accept these arguments in Goldman I.

The district court upon remand found that "even the more generic statements, when read in conjunction with one another,

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[31] Id.
[32] Id.
[33] Id.
[34] Id.
[35] Id.
[36] Id.

may reinforce misconceptions about Goldman's business practices, and thereby serve to sustain an already-inflated stock price."[37] Indeed, Goldman's conflict statements were "quite a bit more specific in form and focus than, say assurances that '[i]ntegrity and honesty are at the heart of our business.'" The Second Circuit found the genericness analysis to be "untenable."[38] The generic statements, they held, were offered in separate reports and thus must be read in isolation as well.

The Court held that the "proper measure of inflation maintenance by a company that chooses to speak 'is not what would have happened had a company remained silent, but what would have happened if it had spoken truthfully.'"[39] This is similar to the test based on Vivendi, resting on the finding that "had the company spoken truthfully…at an equally generic level, the market would have reacted." Thus, the Vivendi test looks at whether a truthful statement that is equally generic, substituted for the alleged misrepresentation, would have impacted the stock price.

Moving forward, the Second Circuit said that a "searching price impact analysis must be conducted where (1) there is a considerable gap in the front-end-back-end genericness…(2) the corrective disclosure does not directly refer…to the alleged misstatement, and (3) the plaintiff claims…that a company's generic risk-disclosure was misleading by omission."[40] Courts should, they held, consider other indirect evidence of price impact

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[37] In re Goldman, 579 F. Supp. 3d at 534.
[38] Id.
[39] Id. Quoting In re Vivendi, 838 F.3d at 258.
[40] Goldman II

"directed at either the inflation-maintaining nature of the generic misstatement, or the price-dropping capacity of an equally generic corrective disclosure."[41] The court concluded holding that future decisions hinge on whether the defendants have demonstrated *by a preponderance of the evidence* that the alleged misstatements did not affect the stock price. Complicating things, the Second Circuit noted that Goldman thus directs courts to consider *"all* record evidence relevant to price impact, regardless whether that evidence overlaps with materiality or any other merits issue."[42] The court noted that "this is a complex case and whatever analytical approaches might be warranted in future cases remains to be seen."[43]

C. Academic Literature

[Discussion of Fisch, et al, Brav and Heaton, Baker, Partnoy, etc…]

III. EMPIRICAL ANALYSIS

A. Sample Description

We collected all *Docketalarm* plaintiff and defendant class certification memoranda of law in federal US 10b-5 shareholder suits filed between June 21, 2020, *i.e.* one year before the Supreme Court decision, and October 4, 2024. We further collected all expert reports filed in conjunction with the

[41] Id.
[42] Id.
[43] Id.

memoranda of law. For court-resolved cases, we further collected class certification orders.[44]

The resulting sample consists of 115 plaintiff motions, 94 defense motions, and 55 court orders associated with 115 distinct 10b-5 cases.[45]

We split the analysis period into three sub-periods to assess the effects of the Supreme Court and Second Circuit *Goldman* decisions. The first sub-period covers one full year before the Supreme Court decision, *i.e.* June 21, 2020 to June 20, 2021. The second sub-period covers the time between the Supreme Court and the Second Circuit decisions, *i.e.* June 21, 2021 to August 9, 2023. The third sub-period covers the time after the Second Circuit decision, *i.e.* August 9, 2023 to October 4, 2024. Because plaintiff and defendant motions are filed at different points in time, the respective motions for a given case may fall into different time categories. As a result, the numbers and percentages vary slightly across the tables in the following section, based on whether the calculations rely on plaintiff versus defendant filings.

B. Empirical Findings

As shown in Table 1, defendants have increasingly challenged class certification following *Goldman*. For cases that reached the class certification stage in the year prior to the Supreme Court *Goldman* ruling, defendants challenged class

[44] We exclude sealed filings and associated orders from our sample. The statistics calculated in the tables are based on cases with publicly-available documents.
[45] In a few instances, we identified more than one plaintiff and defense motion filed in the same case. We exclude duplicate same-case motions if they contain qualitatively identical arguments.

certification in 72% of cases. This fraction reached 92% in the period after the 2023 Second Circuit ruling.

This trend is even more pronounced with regard to defendants' price impact challenges. Defendants challenged price impact in 28% of cases that reached the class certification stage in the year prior to the Supreme Court ruling. In the period between the Supreme Court and Second Circuit rulings, the corresponding figure was 48%. In the period after the Second Circuit ruling, it was 72%. This indicates an important development in Defendants' class certification strategies, with price impact now being a central tenet. The rate of Defendant price impact challenges has effectively more than doubled as a direct result of the *Goldman* decision.

Defendants' increasingly aggressive challenges to class certification is not limited to arguments against price impact. As also shown in Table 1, defendants have increasingly challenged market efficiency and plaintiffs' proposed damages methodologies following *Goldman*. This may suggest that Defendants view the *Goldman* decision as opening the door to other class certification challenges beyond simply direct price impact issues.

Moreover, defendants' challenges to class certification have been increasingly successful following *Goldman*. Table 3 shows that 13% of court-resolved cases challenged by defendants in the year before the Supreme Court ruling were (fully or partially) denied. The corresponding figure following the Second Circuit decision was 25%, almost twice as high.

This trend is even more pronounced in the subset of cases in which defendants challenge price impact. While the sample size

is small for the year before the Supreme Court *Goldman* ruling, Table 4 shows that none of defendants' challenges to price impact in this period were successful. By comparison, defendants' challenges to price impact following the Second Circuit decision were successful 25% of the time.

These empirical findings demonstrate that the *Goldman* decision is already producing significant changes in the litigation strategies of parties to shareholder class actions.

Table 1. Motions for Class Certification

		% of Class Certification Motions Challenged by Defendants			
Filing Date	**Number of Plaintiff Motions Filed**	**Challenged by Defendants**	**Defendant Challenged Price Impact**	**Defendant Challenged Market Efficiency**	**Defendant Challenged Damages Methodology**
Year Before Supreme Court Ruling	25	72% (N=18)	28% (N=7)	8% (N=2)	36% (N=9)
After Supreme Court Ruling, Before Second Circuit Ruling	65	78% (N=51)	48% (N=31)	23% (N=15)	54% (N=35)
After Second Circuit Ruling	25	92% (N=23)	72% (N=18)	32% (N=8)	68% (N=17)

Note: "Year Before Supreme Court Ruling" is the period June 21, 2020 – June 20, 2021, inclusive; "After Supreme Court Ruling, Before Second Circuit Ruling" is the period June 21, 2021 – August 9, 2023, inclusive; "After Second Circuit Ruling" is the period August 10, 2023 – September 30, 2024, inclusive.

Table 2. Reliance on Expert Reports

Filing Date	**Plaintiff Motions**		**Defendant Motions**		**Defendant Motions Challenging Price Impact**	
	N	**% Citing Expert**	**N**	**% Citing Expert**	**N**	**% Citing Expert**
Year Before Supreme Court Ruling	25	92% (N=23)	18	83% (N=15)	7	100% (N=7)
After Supreme Court Ruling, Before Second Circuit Ruling	65	89% (N=58)	51	76% (N=39)	31	94% (N=29)
After Second Circuit Ruling	25	96% (N=24)	23	83% (N=19)	18	89% (N=16)

Note: For each period, the sample of plaintiff and defendant motions are those filed during that period. Therefore same-case plaintiff and defendant motions may be mapped to different time periods.

Table 3. Class Certification Outcomes

Opposition Filing Date	N Cases Challenged by Defendants	N Challenged Cases Resolved in Court	Court Granted	Court Denied / Partially Denied
Year Before Supreme Court Ruling	10	8	88% (N=7)	13% (N=1)
After Supreme Court Ruling, Before Second Circuit Ruling	60	32	81% (N=26)	19% (N=6)
After Second Circuit Ruling	24	12	75% (N=9)	25% (N=3)

Table 4. Outcomes Following Price Impact Challenges

Opposition Filing Date	N Cases Challenging Price Impact	N Cases Resolved in Court	Court Granted	Court Denied / Partially Denied	Court Denied Based on Price Impact
Year Before Supreme Court Ruling	6	5	80% (N=4)	20% (N=1)	0% (N=0)
After Supreme Court Ruling, Before Second Circuit Ruling	34	17	82% (N=14)	18% (N=3)	12% (N=2)
After Second Circuit Ruling	18	8	63% (N=5)	38% (N=3)	25% (N=2)

C. Class Certification Denials

Table 5 reports each case from our empirical sample in which courts denied class certification due to a purported lack of price impact. This includes the four cases indicated in Table 4 plus two additional cases with briefs filed prior to the sample period. In four out of six, or two-thirds of cases (including the Goldman decision), courts cited a mismatch between overly generic alleged misstatements and specific corrective disclosures. The other two cases included reasoning related to non-significant price reactions around alleged misrepresentations and/or alleged corrective disclosures. However, as explained further in the next section, several of these opinions appear to be outliers in light of the prevailing reasoning among courts considering price impact challenges post-Goldman.

Table 5. Class Certification Denials or Partial Denials Related to Price Impact

Case	Date of Opinion	Price Impact–Related Reasoning
Qualcomm Securities Litigation	Mar. 20, 2023	Mismatch in genericness; Truth on the market
In re Goldman Sachs Group, Inc. Securities Litigation	Aug. 10, 2023	Mismatch in genericness
Ramirez v. Exxon Mobil Corp.	Aug. 21, 2023	Non-significant price reaction; Confounding information
In re Kirkland Lake Gold Securities Litigation	Mar. 29, 2024	Mismatch in genericness; Mismatch in content
SI v. Bed Bath & Beyond	Sep. 27, 2024	Mismatch in content; Non-significant price reaction
Shupe v. Rocket Companies	Sep. 30, 2024	Mismatch in genericness

Notes: *In re Goldman Sachs Group* and *Ramirez v. Exxon Mobil* are not included in the sample underlying Tables 1-4 as plaintiffs' and defendants' memoranda of law were filed prior to the sample period.

IV. WHAT IS PRICE IMPACT?

In this section, we discuss the key question raised in the *Goldman* case: What exactly is price impact and how should parties approach an inquiry into price impact at the class certification stage? The *Goldman* court stated: "In assessing price impact at class certification, courts 'should be open to all probative evidence on that question—qualitative as well as quantitative—aided by a good dose of common sense.'"[46] Below we address three key aspects of price impact that have been the subject of judicial review since Goldman: a) a mismatch between alleged misrepresentations and corrective disclosures, b) truth on the market claims, and c) statistical significance of company stock price movements following the alleged misrepresentations or corrective disclosures.

A. The *Goldman* Mismatch

[Goldman, and subsequent cases (e.g., Rocket) relied on expert reviews of class period analyst reports, finding that when no analysts mentioned or discussed the alleged misrepresentations, this supports defendants' severing of the link between the front-end misrepresentations and back-end price drops.]

[This is a somewhat surprising standard of review, given the widespread academic research on analyst reports demonstrating that they exhibit a systematic pro-management bias. Buy-side

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[46] Citing *In re Allstate Corp. Securities Litig*., 966 F. 3d 595, 613, n. 6 (CA7 2020) (quoting Langevoort, Judgment Day for Fraud-on-the-Market: Reflection on Amgen and the Second Coming of Halliburton, 57 Ariz. L. Rev. 37, 56 (2015); emphasis in Goldman decision).

analysts have an incentive to encourage buying, hence their well-documented tendency to issue overoptimistic price targets and recommendations. They also tend to discount short-sellers even when the short-seller reports are valid. As a result, why would a lack of potentially biased analysts' discussion of misrepresentations represent dispositive evidence on the link between the front- and back-end price impact?]

[Other courts seem to agree. In *Brokop et al v. Farmland Partners Inc. et al* the court found that "analyst commentary indicating that 'nobody cared' [about alleged misstatements] is not sufficiently persuasive" to rebut price impact. *In re Chicago Bridge & Iron Co. N.V.*: "[T]he presence or absence of analyst commentary, while of interest, is not a scientifically accepted method of demonstrating price impact or its absence."

Beyond this question, the *Goldman* decision opened the door for significant debate about mismatches. Examples from recent class certification denials in Table 5 above illustrate the difficulties in evaluating potential mismatches:

- Qualcomm Securities Litigation:
- In re Kirkland Lake Gold Securities Litigation:
- SI v. Bed Bath & Beyond:
- Shupe v. Rocket Companies:

[Whereas the *Goldman* decision addressed a mismatch involving generic, boilerplate risk disclosures, recent cases have already moved well-beyond this domain into more complicated territory.]

[Moreover, some of these mismatch evaluations consider statistical significance of alternative hypothetical statements

(e.g., Kirkland). Yet, as explained in the following section, courts have not adopted a consistent approach in setting a threshold of statistical significance, and in fact, in some cases have set a bar that is improperly higher than what would be implied by a preponderance of the evidence.]

[Implications…]

B. Truth on the Market

[it appears truth-on-the market argument were, at least previously, not allowed at the class certification stage. See, e.g., *In re Virtus Investment Partners, Inc. Securities Litigation*, Fed. Sec. L. Rep. (CCH) P 99720, 2017 WL 2062985 (S.D. N.Y. 2017):

"Defendants contend that these [corrective] disclosures could not have impacted Virtus Partners' share price because the truth about back-testing was already revealed. Specifically, Defendants point to three articles in December 2013… Defendants' expert concluded that there was no statistically significant abnormal negative return on the days these articles were published.

But Defendants' argument is essentially a 'truth-on-the-market defense,' which is inappropriate on a motion for class certification. Rebutting "'the [fraud-on-the-market] presumption of reliance' . . . by demonstrating that 'news of the [truth] credibly entered the market and dissipated the effects of [prior] misstatements' . . . is a matter for trial (and presumably also for a summary judgment motion. . .)." Amgen Inc. v. Conn. Ret. Plans & Trust Funds, 133 S. Ct. 1184, 1204 (2013) (quoting Basic, 486 U.S. at 248–49); In re Goldman, 2015 WL 5613150, at *6 ("Defendants' demonstration of 34 separate dates . . . , which allegedly revealed that Goldman had acted against clients'

interest and on which there was no movement in Goldman's stock price, does not show a lack of price impact. This is because the argument is an inappropriate 'truth on the market' defense.")."

[…]

C. Statistical Significance of Price Changes

[Event studies are not required in order to demonstrate price impact. See, *e.g.*, Partnoy DCF paper. This approach was implemented in Alphabet. Case settled for $xxx million.]

[But by far the most common approach to demonstrate price impact is via an event study. For a primer on single firm event study methodology, see Brav and Heaton, Fisch et al, Baker, etc.]

[This section discusses several important aspects of the implementation and interpretation of event studies. As a reminder, the civil law evidentiary burden is "a preponderance of the evidence: - *i.e.*, "more likely than not" As the Goldman decision clearly stated, "defendants can rebut the presumption and defeat class certification by demonstrating, by a preponderance of the evidence, that the misrepresentations did not actually affect, or impact, the market price of the stock."]

[Defendants routinely attempt to raise the bar by asserting that Plaintiffs must demonstrate price impacts that are statistically significant at the 95% level. This has caused confusion among lower courts…

[Quote from Southern ruling pre-Goldman. After the Goldman ruling (add further quotes, e.g., from *In re EQT Corporation Securities Litigation*, at p. 26; *Hall v. Johnson & Johnson et al New Jersey District Court*, at p. [x] ; *St. Clair County Employees' Retirement System v. Acadia Healthcare Company*,

Inc. et al, p. [x]; *Boston Retirement System v. Alexion Pharmaceuticals Inc et al*, at p. 41]

In *Allegheny County v. Energy Transfer*, the court stated:

"The statistical significance of a given event study is another relevant factor in assessing whether price impact can be severed for a given disclosure…. But it should be noted that even a lack of statistical significance is not invariably fatal to a plaintiff's case. Event studies have an inherent rate of error, and where the statistical evidence does not disprove a null value to the requisite confidence level, numerous courts have recognized that as a matter of logic such absence of proof is not proof of absence."

In this case, in fact, the court appeared to interpret Goldman as de-emphasizing the importance of a statistically significant price movement:

"Given this precedent, Defendants' emphasis on a lack of statistical significance immediately after disclosure has even less force. This is borne out by Goldman Sachs, discussed in more detail below, where the Supreme Court stated: "In assessing price impact at class certification, courts should be open to all probative evidence on that question—qualitative as well as quantitative—aided by a good dose of common sense." (1960) (cleaned up)

Ramirez v. Exxon is an exception. [Briefly summarize defendant's argument, plaintiff's reply, and court opinion regarding statistical significance. Note potential tension with other court orders.]

[quote *In re Kirkland Lake Gold Securities Litigation*. In this case, the court noted that the disclosure of "the closest, real-world proxy for a generic, truthful substitute" for the alleged

misrepresentation "was not followed by a statistically significant decline in share price." The court saw this as "probative of the absence of price impact." (p. 19)]

[Fisch, et al explain the flaws behind requiring a 95% confidence level in the securities context. The authors note that the requirement has been "imported" into the law despite a lack of reasoning for why. But confidence levels only address the probability of rejecting non-meritorious claims, i.e. the cases in which the disclosure did not cause a change in the stock price. A forgotten part of event studies is "power": the "erroneous rejection of meritorious claims.[47] The authors conclude that any insistence on a 95% confidence interval increases the likelihood that courts will reject a substantial number of cases of true fraud.[48] Brav and Heaton also explain this.]

[What significance level corresponds to a "preponderance of the evidence?" We put forward two approaches. The first is to simply consider the direction of a stock return after controlling for market and industry movements via an event study. This is known as the residual, or "abnormal" return. If, following an alleged misrepresentation, a company demonstrates a positive abnormal return, this provides evidence of price impact. Similarly, a company's stock price experiences a negative abnormal return following a corrective disclosure, this provides evidence of price impact. The event study is an important step here because it allows the expert to rule out the possibility that a

[47] Id.
[48] Id.

company's stock price movement on a given date is solely the result of changes in the overall market or industry.]

[The second, more rigorous, approach is to evaluate the level of statistical significance of an abnormal return in a way that corresponds with the burden of proof required under a preponderance of the evidence. Because this burden is equivalent to "more likely than not," it should be evaluated against a 50% threshold. Fortunately, the standard event study process allows for such a comparison. Once an abnormal return is calculated, the probability that the abnormal return is the product of randomness can be computed by dividing it by the regression standard error, also known as the root mean squared error (or "RMSE"). This produces a t-statistic, which corresponds to a p-value. The p-value represents the probability that the calculated abnormal return would be observed due to random chance. For example, a p-value of 0.40 indicates a 40% chance of observing an abnormal return of this magnitude due to random chance. Defendants could demonstrate a lack of price impact by showing that all alleged misrepresentations and corrective disclosures were associated with company abnormal returns having p-values of greater than 0.50 – *i.e.*, that they were more likely than not to have occurred due to random chance.]

[Below, we demonstrate additional steps that are important in conducting a reasonable event study, and to further illustrate the inappropriateness of requiring a strict 95% level of statistical significance. Consider a tech firm that discloses with a corrective disclosure on September 27, 2024. During the prior 40 trading

days, the company also disclosed an earnings release on August 7, 2024 and a new product announcement on August 15, 2024….]

Table 6. Hypothetical Event Study Input

Date	Company Return	Market Return	Industry Return	Event
8/2/24	-4.21%	-1.84%	-1.99%	
8/5/24	-2.99%	-2.99%	-3.78%	
8/6/24	-1.60%	1.04%	1.11%	
8/7/24	**-8.50%**	**-0.77%**	**-1.36%**	**Earnings Release**
8/8/24	3.80%	2.31%	3.31%	
8/9/24	0.68%	0.48%	0.64%	
8/12/24	3.37%	0.02%	0.92%	
8/13/24	3.12%	1.69%	3.00%	
8/14/24	0.42%	0.39%	0.61%	
8/15/24	**8.00%**	**1.64%**	**2.54%**	**New Product**
8/16/24	0.60%	0.21%	0.26%	
8/19/24	0.43%	0.98%	1.44%	
8/20/24	-0.58%	-0.20%	-0.32%	
8/21/24	0.38%	0.43%	0.46%	
8/22/24	0.66%	-0.89%	-2.13%	
8/23/24	2.50%	1.15%	1.66%	
8/26/24	-1.42%	-0.31%	-1.12%	
8/27/24	0.78%	0.17%	0.63%	
8/28/24	-1.33%	-0.60%	-1.30%	
8/29/24	2.49%	0.00%	-0.74%	
8/30/24	0.78%	1.02%	1.06%	
9/3/24	-5.50%	-2.11%	-4.43%	
9/4/24	0.31%	-0.16%	-0.41%	
9/5/24	1.27%	-0.30%	0.05%	
9/6/24	-2.72%	-1.71%	-2.40%	
9/9/24	0.73%	1.17%	1.42%	
9/10/24	-1.45%	0.45%	1.23%	
9/11/24	4.46%	1.07%	3.25%	
9/12/24	-1.50%	0.75%	0.82%	
9/13/24	2.65%	0.56%	0.42%	

9/16/24	-0.90%	0.15%	-0.95%	
9/17/24	1.02%	0.03%	-0.09%	
9/18/24	0.01%	-0.29%	-0.51%	
9/19/24	1.62%	1.70%	3.08%	
9/20/24	2.50%	-0.19%	-0.50%	
9/23/24	-2.29%	0.28%	-0.08%	
9/24/24	0.26%	0.25%	0.79%	
9/25/24	-0.72%	-0.19%	0.50%	
9/26/24	-2.75%	0.41%	0.89%	
9/27/24	**-5.50%**	**-0.12%**	**-0.96%**	**Corrective Disclosure**

[Running an event study that includes all three of the event dates above produces an abnormal return on the corrective disclosure of -4.16% and a p-value of 0.076.[49] While this clearly meets the two approaches described above – a negative return after controlling for market and industry movements that day, and a p-value of less than 0.50 – it does not meet the more stringent 95% statistical significance threshold. This is perhaps not surprising, because on average, only 2 trading days out of 40 will be significant at the 95% level. This biases against finding statistical significance at this high level when the event study includes other potentially value-relevant disclosures. This also illustrates the fact that such a test is not evaluating whether a corrective disclosure is inconsistent with randomness, but rather is at least as important as other company-specific disclosures during the estimation window.]

[A more powerful test to measure significance in such a case is to exclude outlier returns that are caused by company-specific

[49] Calculations…

information. If the event study is instead estimated excluding the three outlier information disclosure events, it produces an abnormal return following the corrective disclosure of -4.17% and a p-value of 0.017.[50] This price drop is statistically significant at the 95% level. It also remains valid under the two approaches described above – having a negative return after controlling for market and industry movements and a p-value less than 0.50.]

[Other inputs to the event study estimation must also be considered. It is standard to benchmark an event date price movement against the volatility during the prior 120 trading days (six calendar months) leading up to the event date. Some defense experts have relied on much shorter windows, such as 40 days. And they also have relied on estimation windows that include the event period and go into the future beyond the event disclosure. This is problematic because corrective disclosures often trigger increases in price volatility that may persist for days or weeks. Thus, an event study estimation period that encompasses the disclosure period and/or is relatively short will very likely be underpowered and unable to detect statistically significant price movements even when price impact is present.]

[The considerations above are relevant in many real-world event study scenarios. For example, bellwether firms … (Alphabet). Etc.]

[Summary…]

IV. CONCLUSION

[50] Calculations…