CAN SECTION 11 BE SAVED?: "TRACING" A PATH TO ITS SURVIVAL

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Last term, a unanimous Supreme Court held in Slack Techs. v Pirani that purchasers of securities must "trace" their shares to the registration statement that contains the alleged misstatement or omission in order to be able to assert a claim under Section 11 of the Securities Act of 1933. Lawyers and law firms on both sides of the case agreed (with differing emotions) that the decision eclipsed Section 11, which had been the federal securities laws' strongest litigation remedy for investors. We disagree with this conclusion that Section 11 is doomed, but we recognize the danger. Both in an amicus brief we filed with the Court and now in this article, we show how tracing can be performed and thus Section 11 preserved.

Despite the views of many that it is impossible to trace the chain of title for commingled securities in order to establish standing under Section 11, we argue that this is a misguided, out-of-date assumption because enhanced data-reporting requirements and modern computing power can realistically solve this problem. With an accessible body of transaction records, it is possible to trace the chain of title for securities, using standard accounting methods like first in-first out (FIFO) or last in-first out (LIFO). This allows us to distinguish those investors who purchased only registered IPO shares from those who purchased both registered and unregistered shares. Of course, that a problem can be solved does not mean that both sides will want to solve it. Thus, we examine some of the objections that will likely be raised. Finally, that a technological solution is possible to the problem of tracing that protects both sides suggests that similar solutions should be pursued across a broader context.

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Introduction

On June 1, 2023, a unanimous Supreme Court held in *Slack Techs. v Pirani* that purchasers of securities must "trace" their shares to the registration statement that contains the alleged misstatement or omission to be able to assert a claim under Section 11 of the Securities Act of 1933.[1] Defense counsel and many commentators celebrated this outcome, announcing that it spared issuers and underwriters from alleged abuse by the plaintiff's bar. Still, it also deprived investors as a practical matter of Section 11, which was the principal provision that Congress inserted into the Securities Act to deter fraud in public offerings. We agree that these commentators might be right about the decision's impact, but we believe it is also possible that the decision could mark the beginning of a journey to resolve the problem of "tracing" and thereby restore the role of Section 11 as a force that compels issuers and underwriters to meet a high standard of care and due diligence in public offerings.[2]

Let us summarize our position briefly: We agree that Section 11 must have a tracing requirement for the reasons specified long ago by Judge Henry Friendly—because otherwise issuers would face disproportionate liability out of scale to the amount of stock that they were selling.[3] Indeed, we so argued

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[1] Slack Techs., LLC v. Pirani, 598 U.S. 759, 770 (2023) (holding Section 11 requires a plaintiff "to plead and prove that he purchased shares traceable to the allegedly defective registration statement").

[2] Section 11 of the Securities Act of 1933 (15 U.S.C. §77k) did considerably more than establish a high liability standard approaching strict liability for issuers in public offerings. In addition, it deliberately enacted a "gatekeeper strategy" under which the issuer's agents—its underwriters, accountants, directors and other experts involved in the offering—were placed under a legal duty to exercise due diligence in assuring that the issuer's registration statement contained no materially false statement. As Professors Joel Seligman and Andrew Tuch have written:

> "The structure and interpretation of Section 11 assure that multiple gatekeepers will exercise diligence in order to ensure the completeness and accuracy of issuer disclosures." *See* Andrew F. Tuch & Joel Seligman, *The Further Erosion of Investor Protection: Expanded Exemptions, SPAC Mergers, and Direct Listings*, 108 Iowa L. Rev. 303, 313 (2022).

But due diligence is costly, and places the agents in an adversarial position with respect to their client, the issuer. Thus, the more it becomes difficult to enforce Section 11 (either because of "tracing" or other legal obstacles), the more that the incentive to conduct due diligence and monitor the issuer correspondingly fades. A "gatekeeper strategy" depends on "an outsider who can influence controlling managers to forego offenses" and who is motivated to do so by legal incentives. *See* Reinier Kraakman, *Corporate Liability Strategies and the Costs of Legal Controls*, 93 Yale L. J. 857, 890 (1984). For an evaluation of the contemporary performance of gatekeepers in the corporate world, *see* John C. Coffee, Jr., Gatekeepers: The Role of the Professions and Corporate Governance (2012).

[3] Barnes v. Osofsky, 373 F.2d 269, 272 (1967) ("[Several considerations] point in the direction of limiting § 11 to purchasers of the registered shares, since otherwise their recovery would be greatly diluted when the new issue was small in relation to the trading in previously outstanding shares.").

in the amicus brief that we filed with the Court in the *Slack* case.[4] There, we argued that the real issue that needed to be addressed was not *whether* tracing was to be required, but *how* it was to be done. That remains largely unexamined legal territory, but in the last sentence of its decision in *Slack*, the Court indicated that it was remanding the case to the Ninth Circuit, which seems to imply that the lower courts will need to determine what procedures, if any, plaintiffs should be permitted to use to trace their shares.[5] This brief Article will assess some alternatives that may offer a feasible compromise.

We undertake this inquiry not because we wish to maximize liabilities for issuers and underwriters, but because we want to better implement what we believe was Judge Friendly's true goal: not to eliminate Section 11, but to confine it so that it awarded a more appropriate level of damages. We believe that, since 1933, Section 11 has played a salutary role, inducing the parties to a public offering to conduct greater due diligence and avoid the type of overstatements that are sometimes seen in overheated markets. Absent some sensible compromise on tracing, Section 11 is likely to cease to play that role, and public investors are likely to experience a significant decrease in the protections that they are afforded by the federal securities laws. As we will explain, other litigation remedies simply cannot fill this gap.

I. Background

A. *Section 11 Liability and Direct Listings*

First, a bit of background. Section 11 allows purchasers of securities registered under a registration statement to sue issuers, directors, signatories, underwriters, certain experts, and others for material misstatements or omissions in that statement. Section 11 is particularly appealing to plaintiffs because it imposes strict liability on issuers, thereby eliminating any need to prove scienter, and it is subject only to a limited causation defense. Thus, Section 11 is the go-to cause of action for plaintiffs representing purchasers of securities issued in the initial public offerings (IPOs) by which an issuer enters the public markets.

But *Slack* involved a *direct listing* of shares, an alternative to an IPO. Although both direct listings and IPOs involve shares registered under a registration statement,[6] in direct listings the issuer does not normally raise capital

[4] Brief for Law and Business Professors, as Amici Curiae Supporting Respondent at 4, Slack Techs., LLC v. Pirani, 598 U.S. 759 (2023) ("[W]e do not challenge the legitimacy of the tracing requirement … Section 11 should apply only to the shares registered under the registration statement.").

[5] Slack, 598 U.S. at 770.

[6] Notice of Filing of Proposed Rule Change to Amend Manual, Exchange Act Release No. 89148, at 4 (Jun. 24, 2020) (describing NYSE proposal to "allow a company to sell shares on

by selling shares.[7] Rather, *presently issued* shares are registered and listed on an exchange so that employees and other insiders can cash out by selling the shares they received prior to the IPO, which are likely to be unregistered (but may be resold under, for example, Rule 144).[8]

A critical feature of the *Slack* direct listing was that the issuer did not impose any *lockup* period on insiders or others selling shares. Lockups are typically used in IPOs to ensure that purchasers are not simply providing "exit liquidity" to insiders—that is, enabling insiders to sell at prices that are inflated, relative to the fundamental value of the issuer.[9] Lockups reassure investors that, at least for a given period of time, insiders are not bailing out, but retain significant "skin in the game." Their fortunes are intertwined with those of the purchasers: if the price goes up, they all stand to gain, and if the price goes down, they all stand to lose. Underwriters generally insist on IPO lockups for two primary reasons. Firstly, underwriters are putting their reputations on the line by representing to the public that shares are fairly valued. Secondly, lockups limit the supply of stock that can enter the market after the effective date, thus increasing the likelihood of a positive runup in the stock price on the first several days.[10] Allowing insiders to sell into the IPO would undercut this commitment.

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its own behalf in connection with its initial listing upon effectiveness of a registration statement, without a traditional underwritten public offering"); This proposal was subsequently approved by the SEC. *See* SEC, *Statement on Primary Direct Listings* (Dec. 23, 2020), https://www.sec.gov/news/public-statement/lee-crenshaw-listings-2020-12-23 [https://perma.cc/FM82-SVQH].

[7] Although, while not the case in *Slack*, direct offerings can be used by an issuer for capital raising purposes. Thus, a direct listing may enable an issuer to raise capital, while also ensuring that Section 11 cannot be used against it (because the offering was designed to combine registered and unregistered shares).

[8] SEC Rule 144, 17 C.F.R. § 230.144 (2023), allows for the resale of unregistered securities after a minimum *holding period* has been met, which is typically one year for non-reporting companies.

[9] Alon Brav & Paul A. Gompers, *The Role of Lockups in Initial Public Offerings*, 16 Rev. Fin. Stud. 1, 26 (2003) (finding empirical "support for the notion that lockups serve as a commitment device to overcome moral hazard problems subsequent to the IPO"); James C. Brau et. al, *Lockups Revisited*, 40 J. Fin. & Quantitative Analysis 519, 529 (2005) (arguing lockups function as a counter to adverse selection by "forc[ing] insiders to not only *put* their money where their mouth is but to *keep* it there as well."); Chris Yung & Jaime F. Zender, *Moral Hazard, Asymmetric Information and IPO Lockups*, 16 J. Corp. Fin. 320, 330 (2010) (claiming that rather than having a single, universal purpose, an IPO lockup will address *either* "a moral hazard or asymmetric information problem" depending upon the particular "firm characteristics" of the company going public).

[10] Eli Ofek & Matthew Richardson, *DotCom Mania: The Rise and Fall of Internet Stock Prices*, 58 J. Fin. 1113, 1125 n.11 (2003) (in a typical IPO "approximately 15-20 percent of the [company's] shares are issued to the public. Though not a legal requirement, it is a standard arrangement for the underwriters to insist upon the remaining 80–85 percent of shares to be restricted from sale for a certain period of time without the express written consent of the underwriter.").

In a direct listing, however, there are typically no sales of stock by the issuer, and thus no underwriter, [11] so lockups may seem unnecessary. But eliminating lockups had an unintended consequence which seemed particularly beneficial to the securities defense bar: holders of preexisting unregistered Slack securities were able to sell their shares right away, alongside the registered shares entering the market.[12] This immediate mixing of registered and unregistered securities meant that one could not simply presume that a purchaser like Mr. Pirani (the *Slack* plaintiff), who purchased shares the day of Slack's direct listing, acquired registered shares. He may have purchased unregistered shares that were sold by insiders on the same day of the listing. On this basis, Slack filed a motion to dismiss Mr. Pirani's suit, arguing that because Mr. Pirani did not establish that he could trace the shares he purchased to those registered under the registration statement, he had failed to state an actionable claim under Section 11.

Upholding the district court's denial of that motion, the Ninth Circuit ruled that it was possible for buyers to bring Section 11 claims even without tracing the particular shares they purchased back to a false or misleading registration statement. The court held that even the *unregistered* shares sold in Slack's direct listing were under the purview of Section 11 liability because they entered the market at a time corresponding to the registration statement that covered the registered shares.[13] And since that registration statement was the only one in effect, "All of Slack's shares sold in this direct listing, whether labeled as registered or unregistered, can be traced to that one registration."[14]

On this point, the *Slack* plaintiff suffered a defeat at the Supreme Court. Reversing the Ninth Circuit, the Court held that "[t]o bring a claim under § 11, the securities held by the plaintiff must be traceable to the particular registration statement alleged to be false or misleading."[15] Unsurprisingly, the Court rejected the claim that Section 11 applied equally to registered and unregistered shares.

Commentators in the defense bar have taken Justice Gorsuch's *Slack* opinion as a death knell for Section 11 litigation. Debevoise & Plimpton wrote that

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[11] *See* Brent J. Horton, *Direct Listings and the Weakening of Investor Protections*, 50 FLA. ST. U. BUS. L. REV. 279, 289–90 (2023) (Investment banks in a direct listing do not take on "traditional underwriter activities … the investment bank acts in a diminished role as a financial advisor. It does not 'build the book' and does not purchase shares" the two activities which in a traditional underwriting capacity "inevitably put the investment bank's reputation on the line.").

[12] Slack, 598 U.S. at 759 ("Under the direct listing process, holders of preexisting unregistered shares in Slack were free to sell them to the public right away. Slack's direct listing offered for purchase 118 million registered shares and 165 million unregistered shares."). We note that the expiration of a lockup does not necessarily imply that *unregistered* shares are sold. Insiders may also sell registered shares they own. But lockups typically served to bar the sale of unregistered shares.

[13] Pirani v. Slack Techs., Inc., 13 F.4th 940, 947 (9th Cir. 2021).

[14] *Id.* at 947.

[15] Slack, 598 U.S. at 768.

the *Slack* decision "should provide a defense to Section 11 claims in the direct listing context, given the *impossibility* of determining whether a particular purchaser acquired shares subject to the registration statement or shares otherwise available in the markets."[16] Wilson Sonsini claimed that *Slack* "supports the commonsense defense often asserted by defendants that Section 11 liability cannot attach to shares purchased in a mixed market comprised of registered and unregistered shares."[17] And even before the Supreme Court's opinion, the Ninth Circuit issued a similarly bleak assessment of what would happen to Section 11 if, as it ultimately did, the Court upheld the traditional tracing requirement. The Ninth Circuit warned that that standard, combined with the impossibility of tracing mixed pool purchases, would "create a loophole large enough to undermine the purpose of Section 11 as it has been understood since its inception."[18] But are plaintiffs truly blocked from bringing Section 11 cases for the future? Or is there a way around these new obstacles that does not require legislation and that does not attach Section 11 liability to unregistered shares?

B. The Law of Tracing

Courts have consistently held that the tracing requirement under Section 11 is to be applied in a stringent manner. "The case law is uninterrupted and has long been clear: traceability is strictly construed for a Section 11 claim."[19] But what does a "strictly construed" standard actually look like in practice?[20]

One approach is underwriter tracing, which secures Section 11 standing for plaintiffs who are able to show that they purchased shares directly from the underwriter.[21] There are a variety of ways for plaintiffs to establish the direct purchase. These include "an indication of interest by the broker on behalf of the customer, the customer's receipt of a preliminary prospectus with a legend in red ink (called a 'red herring'), a notation on the purchase order ticket showing purchase in the offering, purchase at the offering price, lack of

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[16] Elliot Greenfield et al., *Supreme Court's Slack Technologies Decision Clarifies Application of Section 11 to Direct Listings*, Debevoise & Plimpton (Jun. 1, 2023), https://www.debevoise.com/insights/publications/2023/06/supreme-courts-slack-technologies-decision [https://perma.cc/RZ5H-E7A3] (emphasis added).

[17] *U.S. Supreme Court Rejects Ninth Circuit Expansion of Section 11 Standing*, Wilson Sonsini (Jun. 5, 2023), https://www.wsgr.com/en/insights/us-supreme-court-rejects-ninth-circuit-expansion-of-section-11-standing.html [https://perma.cc/94UX-ACET].

[18] Pirani, 13 F.4th at 948.

[19] *In re* Puda Coal Sec. Inc. Litig., No. 11 Civ., 2598(KBF), 2013 WL 5493007, at 7 (S.D.N.Y. Oct. 1, 2013).

[20] *Id.*

[21] Kirkwood v. Taylor, 590 F. Supp. 1375, 1378 (D. Minn. 1984), *aff'd*, 760 F.2d 272 (8th Cir. 1985).

commission, language regarding the prospectus on the customer's confirmation slip, and special coding of the transaction by the brokerage firm."[22]

Of course, underwriter tracing should not be the exclusive means of establishing Section 11 standing, because purchasers of registered shares in the secondary market are also entitled to bring a claim. For years, plaintiffs have tried to argue for a probabilistic substitute to underwriter tracing, claiming that it is highly likely, as a matter of probability and statistics, that plaintiffs purchased at least one registered share. This approach has generally been rejected by courts, which have pointed out that an inference that it is "more likely than not" that a given plaintiff purchased a registered share based on population-wide inferences would lead to the conclusion that *every* plaintiff has standing.[23] The result would be that the potential damages are magnified in precisely the way that Judge Friendly sought to avoid.[24]

Where then does this leave plaintiffs who did not purchase directly from an underwriter? If anything other than showing a direct purchase from an underwriter is insufficient, it is difficult to envision how *any* aftermarket purchaser could satisfy that standard. Although some courts have opined that "aftermarket purchasers do not inevitably lack standing,"[25] this statement simply rings hollow after *Slack*. On this view, the existence of more than one registration statement/issuance is a death-knell for these secondary purchasers, and thus Section 11 liability would arise only in the case where there was only one registration statement in effect and all shares of stock were implicitly traceable back to that statement.[26] In the face of this, some plaintiffs have attempted to advance "statistical tracing" arguments, contending that the fraction of registered shares is sufficiently high to establish standing based

[22] *Id.*

[23] *See*, *e.g.*, Krim v. pcOrder.com, Inc., 402 F.3d 489, 497 (5th Cir. 2005) ("Taking a United States resident at random, there is a 99.83% chance that she will be from somewhere other than Wyoming. Does this high statistical likelihood alone, assuming for whatever reason there is no other information available, mean that she can avail herself of diversity jurisdiction in a suit against a Wyoming resident? Surely not."); *see also* Barnes, 373 F.2d at 272 (noting "the overall limitation of § 11(g) that 'In no case shall the amount recoverable under this section exceed the price at which the security was offered to the public,' and the provision of § 11(e) whereby, with qualifications not here material, an underwriter's liability shall not exceed 'the total price at which the securities underwritten by him and distributed to the public were offered to the public,' point in the direction of limiting § 11 to purchasers of the registered shares, since otherwise their recovery would be greatly diluted when the new issue was small in relation to the trading in previously outstanding shares").

[24] Barnes, 373 F.2d at 272.

[25] *Id.* at 495; *see also* Hertzberg v. Dignity Partners, Inc., 191 F.3d 1076, 1081 (9th Cir. 1999) (holding Section 11 standing can extend to aftermarket purchasers and noting "Other circuits that have addressed [the aftermarket] issue agree with our reading of the text [of Section 11] and have uniformly allowed for recovery by purchasers in the aftermarket").

[26] *See, e.g.*, Rosenzweig v. Azurix Corp., 332 F.3d 854, 873 (5th Cir. 2003) (holding that "because there was only *one* offering of Azurix stock, all the plaintiffs' stock is traceable to the challenged registration statement").

on the probabilistic inference that it is much more likely than not that plaintiffs purchased registered shares.[27] Nonetheless, this is an argument that many courts have rejected, and that *Slack* seemingly puts to rest.[28]

We think it is untenable to replace one fallacy with another. The combination of only accepting "direct" tracing and rejecting statistical arguments implies a conclusion that *no purchases* of registered shares occurred in contexts where it is certain that at least *some* purchases of registered shares did in fact occur. The inference that *no* registered shares were purchased is no less fictitious than the inference that *only* registered shares were purchased. There are, no doubt, valid concerns about proper limits to Section 11 standing, but that is no justification for embracing a categorically false view of reality.

Courts need not choose between either fiction. Rather, the myth that tracing is "impossible" is premised on a faulty understanding of the nature of "fungible bulk" ownership at the Depository Trust Company (which is the central depository of shares in the United States).[29] As we explain in the following Section, such a depository can greatly simplify tracing. As we further show, the question of whether a given custodial account (or beneficial owner) holds shares is an *evidentiary* one, which requires a careful examination of the available data.

[27] *See, e.g.*, Krim, 402 F.3d at 496 (5th Cir. 2005) ("Appellants, as aftermarket purchasers, assert that they can also demonstrate [Section 11] standing by showing a very high probability that they each have at least one [] share [issued pursuant to the public offerings in question]. Appellants argue that their statistical determinations, being over 50%, demonstrate by a preponderance of the evidence, that it is 'more likely than not,' that their shares are traceable to the public offerings in question. We are persuaded that accepting such 'statistical tracing' would impermissibly expand the [Section 11's] standing requirement."); *see also In re* Mirant Corp. Sec. Litig., No. 1:02-CV-1467-RWS, 2008 WL 11334395, at *11 (N.D. Ga. Aug. 5, 2008) ("Plaintiffs argue that they can trace all shares purchased by Plaintiff Kellner (and putative class members) vis-a-vis statistical proof, arguing that there is a 99.98% chance that any stock purchased by Plaintiff Kellner or a putative class member prior to April 2, 2001, was issued pursuant to the IPO Registration Statement . . . Plaintiffs' attempt through statistics to demonstrate Plaintiff Kellner's [Section 11] standing as to all 8,000 shares of stock he purchased in March of 2001 fails the tracing requirement of Section 11."); *see also* Doherty v. Pivotal Software, Inc., No. 3:19-CV-03589-CRB, 2019 WL 5864581, at **9, 10, 11 (N.D. Cal. Nov. 8, 2019) (a subset of Section 11 Plaintiffs "argue[d] that since more than seventy-five percent of [Defendant-Issuer's] shares in circulation on November 6, 2018, and more than sixty percent of shares in circulation on December 12, 2018, were issued in connection with the IPO, those IPO shares dominated the market for [Defendant-Issuer's] common stock, 'making it highly likely, or at least more than plausible, that the shares [purchased by this subset of Section 11 Plaintiffs] were issued in the IPO.' . . . [T]he only argument that [this subset of Section 11 Plaintiffs] asserts regarding Section 11 standing is a 'speculative' statistical argument . . . [and therefore this subset of Section 11 Plaintiffs] has not plausibly alleged that its shares are traceable to the [Defendant-Issuer's] IPO and therefore has not plausibly alleged that it has Section 11 standing.").

[28] *See, e.g.*, *In re* Honest Co. Sec. Litig., 2023 WL 3190506, at 5 (C.D. Cal. May 1, 2023); Krim, 402 F.3d at 497 (5th Cir. 2005).

[29] Dan Awrey & Joshua C. Macey, *Open Access, Interoperability, and DTCC's Unexpected Path to Monopoly*, 132 Yale L. J. 96, 106 (2022) (noting that the Depository Trust Company "is the only remaining depository" in the United States securities marketplace).

C. Fungible Bulk, Immobilization and Book-Entry Records

We now summarize how the basic, underlying mechanics of the U.S. securities marketplaces have evolved since Judge Friendly's famous 1966 opinion in *Barnes*. Although Section 11 jurisprudence has largely remained static since *Barnes*, the infrastructure of the market has seen significant change—most acutely since the mid-1970s.

Prior to that, as late as the early 1970s, the U.S. securities marketplace was still "vulnerable to many of the problems that had plagued banks in the nineteenth century."[30] What was the crux of this antediluvian vulnerability? The need for buyers and sellers to *physically exchange* share certificates whenever they made a trade. To settle a transaction, brokerage firms literally had to hire "hundreds of messengers to run around Lower Manhattan"[31] to make the necessary document deliveries between transacting parties. Well beyond simply being inefficient, unreliable, and costly,[32] this practice of physical certificate exchange pushed the entire clearing-and-settlement system "to the brink of collapse"[33] as the daily trading volume continued to rise.[34] There was simply no practical way for a physical delivery system to keep pace with the speed of the market.

The SEC and Congress recognized this fact and took steps to address the so-called "Paperwork Crisis." Subsequent to a 1971 SEC Report outlining the issue,[35] Congress amended the Securities Exchange Act to allow the SEC to instantiate a national system of "prompt and accurate clearance and settlement" that would eliminate the need for a physical system of clearance and settlement.[36] The Depository Trust and Clearing Corporation (DTCC)—and its wholly owned subsidiaries, the Depository Trust Company (DTC) and the National Securities Clearing Corporation (NSCC)—emerged in the wake of the "Paperwork Crisis" (and Congress's response to the crisis) to become the cornerstones of the modern clearing-and-settlement system.

The two DTCC-owned entities provide wraparound services for transacting parties in the securities marketplace. NSCC is a clearinghouse—the only active securities clearinghouse in the United States—which means, at a high level, it matches both sides of a transaction (buy and sell orders) and is a forum for settlement. Further, by acting as counterparty to each side of its

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[30] *Id.* at 127.

[31] *Id.* at 128.

[32] *See id.* at 128 ("Firms regularly lost track of physical securities in their possession. The resulting settlement failures led to at least $4 billion in losses during the late 1960s alone.").

[33] *Id.* at 128.

[34] *See id.* at 128–29 (observing that by the end of the 1960's "average daily equity-trading volumes had reached thirteen million shares a day.").

[35] U.S. Sec. & Exch. Comm'n, Study of Unsafe and Unsound Practice of Brokers and Dealers, H.R. Doc. No. 92-231 (1971).

[36] Securities Acts Amendments of 1975, sec. 15, § 17A(a)(2), 89 Stat. 97, 141 (codified at 15 U.S.C. § 78q-1(a)(2)(A)(i)).

facilitated transactions, NSCC not only processes trades but guarantees payment to sellers and delivery to buyers.[37] This not only contributes to expedited settling but also greatly increases liquidity in the market. DTC is a depository—the central securities depository in the United States—which means, at a high level, it is the entity responsible for holding the securities of market participants such as brokers and banks.

The combined services of NSCC and DTC mean that, now, once parties agree to a transaction—far from having to hire a messenger to deliver stock certificates—NSCC is able to *electronically settle* the already-matched transaction by *drawing from the DTC accounts* of the transacting parties. The DTC has concisely summarized this much-expedited process: "[S]elling brokers deliver securities to an account of NSCC at DTC, not directly to buying brokers. NSCC, in turn, makes deliveries from its DTC account to the buying broker's DTC accounts for settlement at DTC (and NSCC receives and credits payment)."[38]

The process is made possible by the fact that even as, in economic terms, the asset is continually flying around between buyers and sellers, the actual physical certificate of each underlying security has been *immobilized* by DTC.

This process known as immobilization consists of a few simple steps. First, market participants deliver ownership of their securities to DTC. Then, DTC designates "nominee ownership" for these securities to a special-purpose entity, Cede & Company (Cede). Cede thereby becomes the listed "nominee" owner for all the eligible securities for which DTC is acting in a custodial capacity. Meanwhile, DTC's electronic records list the name of the actual or "beneficial" owner of the security.[39]

Thus, instead of having to endlessly shuttle around the physical certificates every time a security is sold, DTC's electronic book-entry is now simply "updated to show that a security sold by a client of one broker/dealer has been debited from the firm's account with DTC and credited to the account of a firm whose client has purchased the security."[40] And DTC's nominee entity, Cede, holds legal title throughout.

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[37] Brief for the Depository Tr. Co. as Amicus Curiae Not in Support of Any Party at 11, *In re.* Petrobras Sec., 862 F.3d 250 (2d Cir. 2017), ECF No. 293 [hereinafter DTC Brief].

[38] *Id.* at 11–12.

[39] Most of the time this will mean a two-step trail of ownership. DTC's records will list the name of the brokerage firm that owns the security, and then the *brokerage firm's* records will list the name of the individual person on whose behalf the firm has purchased the security. *See* Virginia B. Morris, A Guide to Clearance and Settlement: An Introduction to DTCC 14 (2021), ("When investors buy an immobilized security for their brokerage accounts, the investors are listed in their broker/dealers' records as its actual, or beneficial, owners. At the same time, the broker/dealers are identified in DTC's electronic records as holders of the security. When the security is sold, DTC's electronic records are updated at settlement to reflect that [the security] has been debited from the seller's broker/dealer's account and credited to the buyer's broker/dealer's account. Those firms, in turn, update their own records to reflect the sale and purchase of shares.").

[40] *Id.* at 7.

This ownership system—in which Cede, rather than a market participant, is always the one holding legal title to the security being bought and sold—is what is known as an "indirect holding" system, the legal implications of which are governed by Uniform Commercial Code (UCC) Article 8.[41] It creates a "tiered" ownership system, in which a participant-holder of securities holds only an *entitlement* (rather than legal title) to those securities, as the legal title for the entire pool of securities is held by DTC in "fungible bulk" form.[42] This "fungible bulk" ownership form means that every security is fungible with (and can be replaced by) another security from the pool of securities deposited with DTC and owned by Cede. Therefore, shareholders have only a fractional interest in that larger pool.[43]

This modern system of ownership, along with its interrelated modern system of clearance-and-settlement, raises potential concerns about tracing chain-of-title across transactions. The presence of words like "indirect" and "tiered" can contribute to an impression that modern stock ownership has become too diffuse or abstract to be amendable to something like title tracing. Indeed, some experts have argued that more efficient ownership and clearance-and-settlement practices have come at the cost of making it "virtually impossible"[44] to trace a security's chain of title across transactions.[45]

However, this is overstated and does not pay adequate attention to the reality of DTC's record-keeping infrastructure. Book-entry records can be transferred from one custodial account to another. This can be illustrated by a very simple example. Suppose a company has issued 100 shares to Cede, which are held by DTC for the benefit of JPMorgan Chase (JPM). JPM then sells 50 shares to Bank of America (BoA). We are able to observe a transfer of book-entry ownership in those 50 shares from JPM to BoA. The mere fact that JPM holds title in book-entry form does not make it *impossible* to trace the transfer from JPM to BoA. If no other shares changed hands, there are now

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[41] U.C.C. § 8-115 (Unif. L.Law Comm'n 1994); U.C.C. § 8-50 (Unif. L.Law Comm'n 1994).

[42] DTC Brief, *supra* note 37, at 18 ("In sum, the indirect holding system established under UCC Article 8 constitutes a tiered structure of securities ownership interests in which each beneficial interest holder holds a security entitlement only against its own securities intermediary. And, as between an investor and its broker or bank, that entitlement has nothing to do with whether the broker or bank utilizes DTC to settle the transaction by which the investor acquired his interest.").

[43] DTC Brief, *supra* note 37, at 10 (explaining that, under the fungible bulk ownership model, "each Participant to whose DTC account securities of that issue have been credited has a pro rata (proportionate) interest in DTC's entire inventory of that issue, but none of the securities on deposit is identifiable to or 'owned' by or otherwise attributable to any particular Participant").

[44] Joseph A. Grundfest, *Morrison, the Restricted Scope of Securities Act Section 11 Liability, and Prospects for Regulatory Reform*, 41 J. Corp. L. 1, 18 (2015).

[45] Jonathan Rotenberg & Bruce G. Vanyo, *Blockchain Technology May Enable Tracing in Securities Act Litigation*, Nat. L. Rev. (Mar. 22, 2018), https://www.natlawreview.com/article/blockchain-technology-may-enable-tracing-securities-act-litigation [https://perma.cc/ZYS7-BFC4] (noting potential impact of blockchain on Section 11 litigation, where currently the "lack of a direct association between a beneficial owner and a share of stock has created an impenetrable barrier to tracing").

50 shares held by JPM and 50 shares held by BoA. As this example illustrates, "fungible bulk" should not be an easily invoked mantra that serves to magically prevent tracing in every situation. Rather, it simply means that tracing is a question of *evidence* rather than categorical presumptions.

D. A Taxonomy of Tracing Scenarios

Before moving to possible solutions, we outline a few distinct scenarios giving rise to the tracing problem. The suitability of different tracing methods may depend on the specific scenario at issue. We do not discuss the "benchmark" scenario of an IPO in which 100% of the outstanding shares have just been registered. In that case, tracing is obviously unnecessary because every share in circulation was registered under the registration statement.

Rather, we discuss three somewhat more complex scenarios: *first*, a traditional IPO with previously issued unregistered shares trading on the secondary market pursuant to an exemption from resale under Rule 144; *second*, secondary offerings, where an existing publicly traded company sells new shares of stock; and *third*, direct listings as in *Slack*. For each of these scenarios, we explain how the tracing problem presents itself.

1. IPO with Previously Issued Rule 144 Shares on the Market

In this situation, which is common among companies going public, the issuer has previously issued unregistered securities, often to early-stage investors or employees as part of compensation packages. [46] Although sales of unregistered securities are prohibited by Section 5 of the Securities Act of 1933, Section 4(a)(1) of the same provides for an exception. It exempts "transactions by any person other than an issuer, underwriter, or dealer" from registration. [47] This means that recipients of unregistered shares can seek to qualify for the exemption under Section 4(a)(1)—codified as a safe harbor by the SEC in Rule 144—so that they are not inadvertently liable for distributing securities as an "underwriter." [48] Notably, many such recipients do qualify for the Section 4(a)(1) exemption.[49]

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[46] *In re* Snap Inc. Sec. Litig., 334 F.R.D. 209, 211 (C.D. Cal. 2019) (finding standing to be established where both parties acknowledged "only 100,000 of the more than 200 million shares in the market were not traceable to the IPO—meaning approximately 99.95% of the shares in the market during the relevant period *are* traceable to the IPO"); *see also* Sudunagunta v. NantKwest, Inc., No. CV-16-1947, 2018 WL 3917865 (C.D. Cal. Aug. 13, 2018) (standing established when 98% of shares were issued pursuant to an initial public offering).

[47] 15 U.S.C. § 77d

[48] James H. Fogelson, *Rule 144—A Summary Review*, 37 BUS. LAW. 1519, 1522 (1982) ("Rule 144 is applicable to securities received under stock bonus and similar plans that are not registered.").

[49] *Id.*

Under Rule 144, holders of unregistered securities may freely resell those securities as long as a series of conditions are met. In particular, the securities must be held for a minimum holding period—six months for companies which are presently reporting under the Securities Exchange Act of 1934, and one year for all other companies.[50] Other terms include the dissemination of current, public information, a minimum trading volume, that the transactions be conducted as ordinary brokerage transactions, and that a disclosure filing is made with the SEC.[51]

Sales of Rule 144 unregistered securities prior to the IPO can raise tracing questions, even if the plaintiff purchased shares on the day of the IPO itself. Defendants are likely to argue that even if the volume of Rule 144 sales is small—as is typically the case—even a single share "contaminates" the tracing pool due to the nature of "fungible bulk" ownership as discussed previously. That is, so long as there is even a chance that custodial book-entry entitlements held by DTC include some Rule 144 shares, there is a chance that the plaintiffs may actually have purchased unregistered securities and thus may lack standing to bring a Section 11 claim.

To be sure, it has traditionally been common in IPOs for underwriters to insist on "lockup" agreements that prohibit employees and other holders of unregistered securities from selling shares prior to the expiration of a period of time. The rationale for a lockup is simple: the IPO price is supposed to reflect a floor, not a ceiling, on the value of the issuer. After all, investors are being asked to purchase shares at that price, and nobody is expecting that the price will *decline* in the future. Sales by insiders at the same time as the issuer

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[50] SEC Rule 144, 17 C.F.R. § 230.144(d)(1)(i)–(d)(1)(ii) (2023) ("If the issuer of the securities is, and has been for a period of at least 90 days immediately before the sale, subject to the reporting requirements of section 13 or 15(d) of the Exchange Act, *a minimum of six months* must elapse between the later of the date of the acquisition of the securities from the issuer, or from an affiliate of the issuer, and any resale of such securities in reliance on this section for the account of either the acquiror or any subsequent holder of those securities. If the issuer of the securities is not, or has not been for a period of at least 90 days immediately before the sale, subject to the reporting requirements of section 13 or 15(d) of the Exchange Act, *a minimum of one year* must elapse between the later of the date of the acquisition of the securities from the issuer, or from an affiliate of the issuer, and any resale of such securities in reliance on this section for the account of either the acquiror or any subsequent holder of those securities.") (emphasis added).

[51] *Rule 144: Selling Restricted and Controlled Securities*, SEC (Jan. 15, 2013), https://www.sec.gov/about/reports-publications/investorpubsrule144 [https://perma.cc/KHN4-V794] The potential for insiders to avail themselves of Rule 144 is no doubt significantly limited by the fact that the issuer of the securities in question needs to have been, for at least 90 days, "subject to the Exchange Act reporting requirements." *Id.* And companies do not typically become subject to those reporting requirements until their IPO Registration Statement has been declared effective. However, it is possible for an issuer-company to have been required to become subject to the Exchange Act reporting requirements *prior* to its IPO. This famously happened to Google. Google was required to become a publicly reporting company "once it had 500 shareholders, and [it was required] to file the associated financial statements within 120 days of the end of year" in which it crossed that threshold. *See* Eric Schmidt, *How I Did It: Google's CEO on the Enduring Lessons of a Quirky IPO*, HARV. BUS. REV. (May 2010), https://hbr.org/2010/05/how-i-did-it-googles-ceo-on-the-enduring-lessons-of-a-quirky-ipo [https://perma.cc/3CQ2-CTW3].

may suggest that the former is in possession of material, nonpublic information which indicates that the share price is too high. To avoid the market making that sort of adverse inference, a lockup agreement prohibits insiders from selling shares until the expiration of the lockup period.

Nonetheless, IPO lockups do not pose an insurmountable burden to tainting the pool of registered shares with unregistered ones. As we explain in our amicus brief filed in *Slack*, one of the most vocal proponents of such a technique published an article in the *Harvard Law School Forum on Corporate Governance* that explained how "a minor change to the customary lock-up agreement" could "prevent Section 11 strike-suiters from 'tracing' their shares to the IPO."[52] Although acknowledging that the conventional wisdom was that shares registered in an IPO could be traced back to the registration statement because there were at that point no other shares available in the market, he showed that lockup procedures could easily be redesigned to ensure that unregistered shares were always in the market. Since then, his prediction appears to be becoming a reality.

2. Subsequent Offerings

In a subsequent offering, an *existing* publicly traded issuer sells *newly issued* shares to raise additional capital. Under Section 5 of the Securities Act, these newly issued shares must also be registered pursuant to a registration statement, and it is common for plaintiffs to bring Section 11 claims for misstatements and omissions made in registration statements accompanying subsequent offerings (but which were not present in the registration statement accompanying the IPO).[53]

Such subsequent offerings present tracing issues because only purchasers of the shares issued under the new registration statement have standing to bring a Section 11 claim. Like Rule 144 sales, the presence of multiple registration statements "contaminates the pool"—that is, some securities were registered under one registration statement while others were registered under another registration statement. Also, it is possible that the Section 11 statute of limitations will have expired on some of the earlier registration statements.

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[52] *See* Boris Feldman et al., *A Modest Strategy for Combatting Frivolous IPO Lawsuits*, HARV. L. SCH. F. CORP. GOVERNANCE (Mar. 13, 2015), https://corpgov.law.harvard.edu/2015/03/13/a-modest-strategy-for-combatting-frivolous-ipo-lawsuits/ [https://perma.cc/AA4Q-DUZS].

[53] *See In re* Century Aluminum Co. Sec. Litig., 729 F.3d 1104, 1106 (9th Cir. 2013) ("Plaintiffs allege that the shares they purchased were issued under a materially false and misleading prospectus supplement dated January 28, 2009, which is treated as part of the company's registration statement for purposes of § 11. Century Aluminum issued the prospectus supplement in connection with a secondary offering of 24.5 million shares of the company's common stock. When the secondary offering commenced, more than 49 million shares of Century Aluminum common stock were already in the market. To prevail, plaintiffs would need to prove that the shares they purchased came from the pool of shares issued in the secondary offering, rather than from the pool of previously issued shares.").

Because both types of securities trade freely under the same ticker, a plaintiff who purchases shares in the open market may have acquired one or the other. Even a plaintiff who purchased on the *day* of the secondary offering may have acquired previously issued shares, so long as there was at least one share sold by existing sellers on that same day.

Indeed, the "magnitude" of the tracing problem may be larger for subsequent offerings than for Rule 144 sales. Following an IPO, the volume of shares sold by employees and early-stage investors during the period when plaintiffs acquired their shares often amounts to a very small fraction of the pool of issued and outstanding shares, sometimes less than 1%.[54] By contrast, shares sold in a subsequent offering will typically be larger (although it is unusual for such shares to exceed 50% of that pool, which would require one new share to be issued in the subsequent offering for every share that had been previously issued in the IPO). The problem is complicated further when, as is often the case, issuers sold shares pursuant to *multiple* subsequent offerings, and all of those shares are circulating under the same ticker symbol.

3. Direct Listings

Yet another situation which presents tracing issues is that underlying *Slack* itself: direct listings. In a direct listing, lockups are unlikely to be present, in part because one of the central purposes of a direct listing is to allow insiders to sell shares on the public markets at the time of the listing. For this reason, one would expect that a fairly large number of Rule 144 or otherwise unregistered securities would flood the market on the first day of trading. This sort of situation poses the same challenges discussed with IPOs and subsequent offerings.

II. Some Possible Solutions to the Tracing Problem

A. *Mandatory Lockup Periods*

In March 2023, a working group of academics, former SEC officials, and legal scholars submitted a rulemaking petition to the SEC in response to developments in the law around Section 11 liability and, in particular, tracing.[55]

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[54] *See* Snap, 334 F.R.D. at 223–24 ("[O]nly 100,000 of the more than 200 million shares in the market were not traceable to the IPO—meaning approximately 99.95% of the shares in the market during the relevant period *are* traceable to the IPO."); *see also* Sudunagunta, 2018 WL 3917865, at *5 ("[O]nly 240,663 Non-IPO shares…were in the market during the lock-up period, compared to the over 9.5 million IPO-registered shares.").

[55] Edwin Hu et al., Working Group on Investor Protection in Public Offerings *Petition for Rulemaking: Modernization of Rule 144*, SEC (Mar. 9, 2023), https://www.sec.gov/files/rules/petitions/2023/petn4-801.pdf [https://perma.cc/4AMB-6TN7].

The petition notes that the emergence of (a) direct listings with no lockup periods, and (b) waivers of lockup periods in the wake of IPOs, have complicated tracing by creating "post-offering pools" where registered and unregistered securities comingle.[56] This contemporary development—in which registered and unregistered shares mix far earlier than they would have done (as, for example, when a formerly-standard 180-day lockup was in place)—makes it harder for potential Section 11 plaintiffs to show (via tracing) that they did indeed purchase registered securities.

The working group argued that these practices, and their winnowing down of the lockup period, have already begun to distort Section 11 litigation. Seeing the wrench that mixed security-types throw into the machinery of tracing, issuers' lawyers have already begun to advise their clients "to intentionally comingle the sale of unregistered and registered securities" to limit their Section 11 liability.[57] To counteract this centrifugal drift, the working group's petition recommends the SEC amend Rule 144. Specifically, the petition recommends that the SEC establish holding periods (lockups) for unregistered shares as the later of (a) 90 days or (b) the next 10-Q or 10-K.[58]

Former SEC chairman Jay Clayton and law professor Joseph Grundfest filed an amicus brief in the *Slack* case that was similarly focused on lockup-modification as a way, in light of contemporary tracing challenges for plaintiffs, to preserve Section 11 liability. They argue that the SEC "can take a variety of administrative actions to address the tracing challenge that arises in direct listings, and in all other forms of Section 11 litigation."[59] One such potential measure is an SEC requirement that registered and exempt shares offered in a direct listing trade with "differentiated tickers, at least until the expiration of the relevant Section 11 statute of limitations."[60] They also offer a "narrower approach" whereby the SEC mandates what is essentially a one-day lockup period.[61] Specifically, exempt (unregistered) shares would not be tradeable "until *the day after* an initial auction that is limited to registered shares."[62] In terms of the entry of registered and unregistered shares into the market, this would make a direct listing resemble an IPO with universal one-day lockups. Whether the SEC has authority to take such a step is debatable, particularly to the extent that it imposes trading limitations on already issued shares.[63] Finally, there is a problem of proportionality. Because only a

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[56] *Id.* at 2.
[57] *Id.* at 5.
[58] *Id.* at 6.
[59] Brief for the Honorable Jay Clayton and the Honorable Joseph A. Grundfest as Amici Curiae Supporting Petitioners at 3, Slack Techs., LLC v. Pirani, 598 U.S. 759 (2023) (No. 22-200).
[60] *Id.* at 31.
[61] *Id.* at 32.
[62] *Id.* at 33 (emphasis added).
[63] We do not mean to oppose such an effort (which also creates tracing problems), but foresee the possibility of litigation.

minority of public offerings attract Section 11 litigation, it may seem disproportionate to impose even a short lockup period on all offerings.

Another similar approach, though one focused more centrally on burden-shifting, would utilize SEC Rule 173, which currently requires selling-underwriters or selling-dealers (but not issuers) to provide notice to buyers when a transaction was made pursuant to a registration statement.[64] The SEC could potentially extend Rule 173's notification requirement to issuers as well. Rather than altering the nature of lockups, this approach could claim to simply be introducing parity to the reporting requirements for all seller-parties in the IPO process. The notice from the issuer would hopefully serve to identify all registered shares, but again on the sale of such shares, tracing problems would re-emerge.

B. Tracing in Fungible Bulk Custodial Records

As we have previously noted, many judges, academics, plaintiffs' and defense attorneys still subscribe to the myth that it is impossible to trace chain of title for commingled securities in order to establish standing under Section 11. Unfortunately, this is a misguided, out-of-date assumption because enhanced data-reporting requirements and modern computing power can realistically solve this problem.

Continuous time-stamped transactional records must be maintained by many parties in the securities marketplace, including broker-dealers, exchanges, and the Financial Industry Regulatory Authority (FINRA).[65] What are known as FINRA Blue Sheets, for example, "contain both trading and account holder information," meaning for any trade a firm executes on behalf of a client, the firm is keeping a record of the name of the security, the date of the trade, the price of the trade, and with whom the individual client traded.[66] These records are submitted, kept, and stored electronically.[67] Even more significant, pursuant to SEC Rule 613, all certified participants in the United States securities marketplace have to submit their detailed, extensive records into a pooled, centralized system, known as the Consolidated Audit

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[64] 17 C.F.R § 230.173(a) (2023).

[65] *See e.g.,* 17 C.F.R. § 240.17a-3(a)(6) (2024) (requiring broker-dealers to maintain detailed records on individual orders, including "the time the order was received, the time of entry, the price at which executed, the identity of each associated person, if any, responsible for the account . . . and, to the extent feasible, the time of execution or cancellation").

[66] *Electronic Blue Sheets (EBS)*, FINRA (Nov. 17, 2023), https://www.finra.org/filing-reporting/electronic-blue-sheets-ebs#overview [https://perma.cc/4DRS-YNV5].

[67] *See id*. ("FINRA sends Blue Sheet requests to firms by email and also posts them on FINRA's Request Manager system as a second means of notification."). FINRA's Request Manager system "facilitates the electronic exchange of information between firms/individuals and FINRA. With Request Manager, which is available via the FINRA Gateway and its designated portal, firms and individuals are able to securely submit, manage and track FINRA information requests." *Request Manager*, FINRA (Dec. 20, 2024), https://www.finra.org/filing-reporting/request-manager.

Trail (CAT).[68] This removes the need for plaintiffs to subpoena every individual broker-dealer whose accounts at one time held the securities in question.[69]

While tracing may sometimes be exacting (due to the high-velocity and frequency of trading), no computing limitation prevents tracking the ownership of a security across any number of transactions. And the record-keeping infrastructure, from CAT down to individual firms' FINRA Blue Sheets, ensures there is similarly no record-data limitation to tracking ownership of a security across any number of transactions using standard accounting methods like first in-first out ("FIFO").

These extensive records are held electronically. The practical significance of this is that all the immense power of modern computing can be applied to parsing, searching, and analyzing that store of transactional data. Modern computing has the capacity to process records for any number of transactions, even into the trillions. This was not the case in the 1960s and 1970s, when many of the attitudes in the law around tracing began to ossify.

Tracing example: methodology. With an accessible body of transaction records (both in terms of record-keeping and computing power), it is possible to trace the chain of title for securities, using standard accounting methods like first in-first out or last in-first out ("LIFO"). In this context, as its name indicates, FIFO treats the earliest ("first") incoming security as the first one to go out. Conversely, LIFO treats the most recent ("last) incoming security as the first one to go out. A very simple example demonstrates the two methods in actions:

Suppose Broker A received 10 unregistered shares at 9 AM, and then received 10 registered shares at 12 PM. And that Broker A then sold 10 shares to Broker B at 3 PM.

Using FIFO, we conclude the 10 unregistered shares were the ones sold to Broker B at 3 PM, since the unregistered shares were the first to enter Broker A's account. And thus Broker A is left holding 10 registered shares, and Broker B holding 10 unregistered shares.

Using LIFO, we conclude that the 10 registered shares were the ones sold to Broker B at 3 pm, since the registered shares were the last to enter Broker's account. And thus Broker A is left holding 10 unregistered shares, and Broker B holding 10 registered shares.

The above example was designed for this context (using registered and unregistered shares), but the application of those accounting methods to trace assets moving through commingled accounts is ubiquitous across various

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[68] 17 C.F.R § 242.613(a) (2024) ("Creation of a national market system plan governing consolidated audit trail").

[69] *See* Order Approving the National Market System Plan Governing the Consolidated Audit Trail, Exchange Act Release No. 34-79318 (Nov. 15, 2016) ("[T]he CAT NMS Plan provides that the confidentiality provision does not restrict disclosures required by: . . . an order, subpoena or legal process.").

areas of law. Courts have established that a holder of a security interest may trace property transferred through comingled bank accounts.[70] Similarly, it is well-established under trust law that a beneficiary may enforce a constructive trust on a wrongful transfer of trust assets by tracing the assets through the relevant transfers of the assets through comingled accounts.[71] And in the criminal forfeiture context, courts have held that these accounting methods are acceptable and effective for tracing the proceeds and flow of illegal activity even as they become commingled with other assets.[72]

The FIFO accounting method is also commonly utilized by broker-dealers to determine their tax liability. FIFO enables the proper calculation of basis value—and subsequently, the correct tax obligation—for sales of shares of identical stock. Under SEC Regulation SHO, "[T]axpayers owning blocks of identical stock acquired on different dates or for different prices determine their stock's basis by using the FIFO method."[73] And in a different legal context but for the similar purpose of calculating financial obligations, LIFO has been used by courts for purposes of determining damages in securities litigation.[74]

Methodology (in general). Expert analysis, generally speaking, reflects a scientific or professional opinion based on all available information and evidence in the expert's possession. It is widely understood that expert analysis will include methodological assumptions, choices about control variables, and other manifestations of research design. This is reflected by the fact that expert analysis is scrutinized based on the sensibility and defensibility of its methodological assumptions. Expert opinion is not disqualified for containing those assumptions.

Like any form of expert testimony, accounting methods employ methodological choices. In this respect, they are no different from any methodological tool employed in expert analysis. Consider, for instance, an event study—a paradigmatic piece of expert analysis employed in securities fraud litigation—to determine and demonstrate whether a misstatement or omission led to an abnormal return, that is, an unusual price change. The expert designing this event study will necessarily make numerous choices on a number of fronts, like the selection of control variables. An event study with one particular set

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[70] Brown & Williamson Tobacco Corp. v. First Nat. Bank of Blue Island, 504 F.2d 998, 1002 (7th Cir. 1974) (stating that where the proceeds of collateral can be "traced into a bank account, such proceeds would be deemed identifiable and subject to the security interest").

[71] *See* Restatement (Second) of Trusts § 202 cmt. j (Austin W. Scott 1959).

[72] U.S. v. Banco Cafetero Panama, 797 F.2d 1154, 1160 (2d. Cir. 1986) ("Government … can establish a prima facie case for [criminal] forfeiture in the context of bank accounts by relying on either the 'drugs-in, last-out' approach or the 'drugs-in, first-out approach.'").

[73] Turan v. Comm'r of Internal Revenue, 114 T.C.M. (CCH) 65, 2 (T.C. 2017).

[74] *In re* Vivendi Universal, S.A. Sec. Litig., 284 F.R.D. 144, 160 (S.D.N.Y. 2012) ("damages will be computed using LIFO").

of control variables may yield a statistically significant price drop where an event study with different control variables would not have.[75]

The inclusion of each of potential control variable is a *choice*. Consider, for example, subtracting industry-wide price changes in an event study designed to measure whether an abnormal price decline (relative to the industry) was statistically significant. That may be defended as a matter of adjusting for "industry-specific facts, conditions, or other events, which taken separately or together account for some or all of that lower price."[76] But to the extent that information about one firm affects other firms in an industry—a possibility that has been documented in emerging research on so-called "shadow trading"[77]—subtracting industry-wide price changes may lead to distorted conclusions regarding the impact of a misstatement or omission on the price of a company's stock. That is, the attempt to subtract industry-wide price changes distorts one's assessment of the impact of the misstatement on the company's stock because the subtraction of the industry-wide price changes will entail the subtraction of some portion of the price impact that purportedly would not have occurred but-for the misstatement. This is because the misstatement may also have affected industry-wide prices.

For an expert considering whether to make this adjustment, the question, therefore, is not whether it is "*correct*" to control for industry-wide trends but whether, in light of the facts and circumstances of a given case, it is *appropriate* to do so. That is, just as no control variable can ever be inherently, as a scientific matter, "correct," one accounting method is not inherently "correct" or another flawed. An event study is constructed with choices. It is not one large unadulterated chunk of reality. Those assumptions and choices are then challenged and defended; their existence, however, is not. The relevant question is whether the assumptions and choices are *appropriate*, and can be defended as *superior* to other models, that is, other *choices*, given the relevant epistemological and data constraints.

The same is true with respect to tracing title. The question is not whether, for example, a broker physically sends out shares beginning with those which first entered her account (LIFO). Clearly, LIFO's representation of reality is, in part, the product of a methodological choice. The choice *is* in the method's name; no one is seeking to conceal the existence of choices. The question is the appropriateness of the choices inherent to LIFO, FIFO and other

[75] *See generally, e.g.,* Sanjai Baghat & Roberta Romano, *Event Studies and the Law: Part I: Technique and Corporate Litigation*, 4 AM. L. ECON. REV. 141–67 (2002).

[76] Dura Pharmaceuticals v. Broudo, 544 U.S. 336, 343 (U.S. 2005).

[77] Mihir N. Mehta, David M. Reeb & Wanli Zhao, *Shadow Trading*, 94 ACCT. REV. 367 (2021). This rule limits the amount of funds a claimant can be awarded from a commingled account. It limits the claim to the lowest intermediate balance reached by the account in the interval between the commingling/mixing of funds in the account and the bringing of the claim.

methodologies such as lowest intermediate balance ("LIBR") given (1) the circumstances of a particular case and question of law, and (2) the available alternative methodologies.

The reasonableness prong has already been discussed in part earlier in this section. To review, tracing is frequently utilized across various areas of law in cases dealing with commingled assets. Additionally, there are multiple standard methods of tracing at an expert's disposal. However, no methodological assumption can be inherently correct, as a matter of science. Therefore, the ability to trace using LIFO, FIFO, and other methods such as LIBR means the validity of a tracing method's conclusions can be bolstered by a showing that the results hold *across* different accounting methods.

Methodological differences are not inevitable. Consider the following example. A gets 10 unregistered shares at 9 AM, 10 registered shares at 9:15 AM, and 10 unregistered shares at 9:30 AM; and A sells 20 shares to B at 9:45 AM. LIFO and FIFO would *each* conclude A sent B 10 registered and 10 unregistered shares. This cross-methodological consistency is a clear and compelling rebuttal to any critiques of the subjectivity or artificiality of a particular method. Because using standard accounting methods to trace is so systematic and straightforward, it makes these sort of alternate comparative approaches very easy.

Further, tracing is not only "reversible" (or at least adjustable, i.e., switching from LIFO to FIFO) but internally coherent. A given method makes and announces its assumptions and treatment of the data at the outset and then produces objective, reproducible results that *answer* the question of Section 11 standing with certainty. In other words, tracing is *not* an exercise in statistical probability. Discretion is *front-loaded*. Courts, opposing counsel, opposing experts, etc. can all scrutinize the chosen tracing method and how suited it may be to the facts of a particular case. Once those assumptions and choices—which, again, are present in any expert analysis—are addressed and considered, tracing produces a clear, yes-no answer with respect to standing.

This distinguishes tracing even from event studies. In the case of event studies, courts allow for both differing methodological choices *and* admit probabilistic evidence with only a 95% confidence interval. Tracing, meanwhile, is analogous to offering courts method A or B where each A and B provide an answer with 100% certainty, rather than offering expert analysis that itself only claims X% probability of accuracy.

However, it should be noted that the frontloaded assumptions (i.e., arguable methodological choices) for tracing include more than simply opting for FIFO or LIFO. While the reservoir of data is immense, as outlined earlier, these data are not always sorted and organized in a self-evident manner. That is, just because timestamped transactional records are available does not mean the records still do not have to be arranged in ways that involve discretion. For example, an expert will have to make choices—that will seek to be logical and defensible—about sequencing DTCC data. Because accounting methods

like FIFO and LIFO are obviously dependent on the underlying order (sequence) of transactions, these determinations and arrangements by an expert will undoubtably affect their results.

Tracing's merits—and limitations—should not be evaluated in isolation. Rather, that evaluation should be done against the backdrop of other available options and their implications. For an alternative method to be superior, it needs a plausible claim to being to a *more accurate* representation of reality. The choice is not between tracing and perfection. The choice is between tracing and blindness to the fact that shares *did, in fact,* move from one account to the other.

As earlier sections have outlined, tracing is a requirement for Section 11 plaintiffs. Therefore, ruling out the use of standard accounting methods like FIFO and LIFO to trace the title of securities in commingled accounts will mean that, in practice, any purchaser of a mixed pool (registered and unregistered securities) would be categorically unable to bring a claim under Section 11. That approach is no less a "method" than FIFO or LIFO tracing. And its practical, legal conclusion—a purchaser of securities from a mixed pool cannot be said to have purchased registered securities—is no less a "representation of reality" than FIFO or LIFO tracing's conclusions. And the results from the "no tracing of commingled assets" approach are quite likely to be a far *less* accurate representation of reality than those provided by FIFO or LIFO tracing.

Further, not only would that likely be less accurate, but the burdens or practical implications of that inaccuracy would seemingly be distributed in a manner that is neither equitable nor in line with the intent and purpose of Section 11. Namely, all difficulties or limitations related to tracing would come at the cost of would-be plaintiffs, and a significant subset of purchasers of securities (those purchasing from a mixed pool of registered and unregistered securities) would be stripped of the benefits and protections of Section 11 standing.

Avoiding that outcome is precisely why accounting measures are utilized everywhere else in the law. It does not make sense on either an epistemological or an equitable basis to throw our hands up anytime different types/classes of assets are commingled.

Tracing chain of title for securities using FIFO and LIFO is not only a compelling approach based on its merits and in comparison to other available approaches. It also is responsive and well-suited to what contemporary courts—most particularly the current Supreme Court—have expressed a desire to see from Plaintiffs. Specifically, as outlined earlier, tracing is not statistical modelling, and it provides yes-no results with 100% certainty, rather than a probabilistic range of outcomes.[78]

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[78] As with any scientific methodology, there are implementation details that will likely need to be resolved on a case-by-case basis. One example is the treatment of securities lending in connection with short sales, which may involve custodial transfers of registered shares to borrowers.

That makes it especially well-suited to the current judicial climate because, as the headline of a FiveThirtyEight article put it, "The Supreme Court Is Allergic To Math."[79] More significant than a lack of nuanced understanding of mathematical modeling is the Court's hostility to such methods. While substantively distinct from Section 11 litigation, cases concerning political gerrymandering provide an example of the problems that arise with primarily relying on statistical models to demonstrate the existence of a particular phenomenon. In a gerrymandering case argued before the Supreme Court in October 2017, Plaintiffs relied on a statistical metric created by law professors called the "efficiency gap." The metric "represents the difference between the parties' respective wasted votes in an election—where a vote is wasted if it is cast (1) for a losing candidate, or (2) for a winning candidate but in excess of what she needed to prevail … The efficiency gap essentially aggregates all of a district plan's cracking and packing choices [i.e., methods of gerrymandering] into a single tidy number."[80]

"Tidy" as the methodological approach may be—or in Plaintiffs' lawyer's description of the efficiency gap in oral arguments before the Supreme Court: "this is … this is not complicated"[81]—the Court still was not impressed by its helpfulness for standing considerations. In the opinion of a unanimous Court that found that Plaintiffs had failed to demonstrate Article III standing, Justice Roberts wrote:

> "The plaintiffs and their amici curiae promise us that the efficiency gap and similar measures of partisan asymmetry will allow the federal courts—armed with just 'a pencil and paper or a hand calculator'—to finally solve the problem of partisan gerrymandering that has confounded the Court for decades … *We need not doubt the plaintiffs' math. The difficulty for standing purposes is that these calculations are an average measure. They do not address the effect that a gerrymander has on the votes of particular citizens*."[82]

Although we should be wary of analogizing between distinct areas of law, a general implication of the Court's opinion, discussed above, is relevant to

In that sort of situation, which is common, questions may arise such as whether lenders (who may no longer have custody of their shares) have standing under Section 11, and if so, at what times, and the effect of receiving unregistered shares to satisfy a lending obligation on Section 11 standing. We leave the resolution of these complex questions (which are likely to be fact-specific) for expert analysis in light of the facts and circumstances of a given case.

[79] Oliver Roeder, *The Supreme Court Is Allergic To Math*, FiveThirtyEight (Oct. 17, 2017, 6:00 AM), https://fivethirtyeight.com/features/the-supreme-court-is-allergic-to-math [https://perma.cc/D5D6-TJ4K].

[80] Nicholas O. Stephanopoulos & Eric M. McGhee, *Partisan Gerrymandering and the Efficiency Gap*, 82 U. Chi. L. Rev. 831, 834 (2015).

[81] Transcript of Oral Argument at 40:15–16, Gill v. Whitford, 585 U.S. 48 (2018), https://www.supremecourt.gov/oral_arguments/argument_transcripts/2017/16-1161_mjn0.pdf.

[82] Gill v. Whitford, 585 U.S. 48, 72 (2018) (emphasis added).

tracing—namely, its insistence on methods producing *individualized* answers on standing. Even if some sort of aggregate statistical model for determining the percentage of registered and unregistered shares in the secondary market, or the likelihood that any group of similarly-situated purchasers bought a registered security were potentially "better" or "more reflective of reality" in some purely academic sense, it would not seem to be the kind of answer courts are looking for to these types of questions. By contrast, tracing using FIFO or LIFO methods does provide an *individualized* answer on standing.

III. Litigation Issues Arising from Section 11 Tracing

A. *Initial Framework*

Any plan to preserve Section 11 as a viable litigation remedy after *Slack*[83] necessarily intersects with the issue of whether a Section 11 action can be maintained at all if the plaintiff needs discovery to establish that its shares are "traceable" to the registration statement. The problem here relates less to the Court's insistence in *Slack* that a Section 11 plaintiff be able to trace its shares, and more to the Private Securities Litigation Reform Act's ("PSLRA") requirement that the plaintiff be generally denied discovery prior to the trial court's decision on the defendant's motion to dismiss. Here, Section 21D(b)(3) of the Securities Exchange Act provides:

> "In any private action arising under this chapter, all discovery and other proceedings shall be stayed during the pendency of any motion to dismiss, unless the court finds upon the motion of any party that particularized discovery is necessary to preserve evidence or to prevent undue prejudice to that party."[84]

Thus, assuming that a motion to dismiss a Section 11 cause of action will ordinarily be filed by the defendant, it might appear at first glance that the plaintiff is blocked from discovery aimed at determining whether the plaintiff's shares can be traced to the registration statement. But, on closer inspection, this conclusion seems incorrect, in large part because Section 11 does not require any proof of intent.

To understand this point, we need to turn to Section 21D(b)(2) of the Securities Exchange Act, which mandates that:

> …in any private action arising under this title in which the plaintiff may recover money damages only on proof that the defendant acted with a particular state of mind, the complaint shall, with respect to

[83] Slack, 598 U.S. at 759 (2023).
[84] 15 U.S.C. § 78-u-4(b)(3)(B).

> each act or omission alleged to violate this title, state with particularity facts giving rise to a strong inference that the defendant acted with the required state of mind.[85]

In a Rule 10b-5 action, this is a formidable obstacle to the plaintiff because it is difficult to plead with particularity facts "giving rise to a strong inference" of scienter (the state of mind necessary to support a Rule 10b-5 action) in the absence of discovery. But this obstacle dissipates in the case of a Section 11 cause of action because Section 11 does not require proof of any state of mind.[86] Indeed, although it allows individual defendants to plead an affirmative defense of "due diligence" and good faith, Section 11 is basically a strict liability provision with regard to the corporate issuer.[87]

Assume then that the defendant finds some justification for filing a motion to dismiss in a Section 11 case. The simplest claim would be that the facts, as alleged, do not give rise to a cause of action for securities fraud, perhaps because the complaint fails to identify a misrepresentation or omission in violation of a duty to disclose or because any alleged misrepresentation or omission fails to satisfy the materiality standard, which requires that the misstatement or omission "would have been viewed by the reasonable investor as having significantly altered the total mix of information made available."[88] Conceivably, the defendant may also allege issues as to extraterritoriality or the statute of limitations, or the defendant may simply assert that the complaint fails the low standard of pleading required by *Twombly*.[89] Assume further that the defendant will predictably fail to provide any discovery until this motion to dismiss is resolved, and it may argue that dismissal is required because the plaintiff has not to this point provided any evidence that its shares can be traced to the registration statement.

Such arguments strike us as lacking merit. Except when the plaintiff is required to show a "strong inference of fraud"—which is unnecessary in a Section 11 case—neither federal civil procedure nor the PSLRA require the plaintiff to prove any form of intent at the motion to dismiss stage. Rule 9(b)

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[85] 15 U.S.C. § 78-u-4(b)(2)(A).

[86] Unless the claim being brought under Section 11 concerns a statement of opinion rather than of fact. In such a case, heightened "state of mind" pleading is then required to show that the maker of the opinion-statement did not subjectively believe the opinion to be true when the statement was made. *See* Omnicare, Inc. v. Laborers Dist. Council Const. Indus. Pension Fund, 575 U.S. 175, 176 (2015) ("[O]pinion statements are not wholly immune from liability under § 11's first clause. Every such statement explicitly affirms one fact: that the speaker actually holds the stated belief. A statement of opinion thus qualifies as an 'untrue statement of . . . fact' if that fact is untrue—i.e., if the opinion expressed was not *sincerely held*.") (emphasis added).

[87] *See* 15 U.S.C. § 77k(a)(4); 15 U.S.C. § 77k(a)(5).

[88] Basic, Inc. v. Levinson, 485 U.S. 224, 232 (1988).

[89] Bell Atl. Corp. v. Twombly, 550 U.S. 544, 570 (2007) (holding plaintiffs must only plead "enough facts to state a claim to relief that is plausible on its face.").

does require particularized pleadings in fraud actions,[90] but again Rule 9 is inapplicable to Section 11 as fraud does not factor into the Section 11 analysis. Thus, it underlines that particularized pleading is the exception, not the rule. Indeed, courts have routinely held that Section 11 claims are subject to the liberal pleading standard of Rule 8, which requires "a short and plain statement of the claim showing that the pleader is entitled to relief" and "a demand for the relief sought.":

> Section 11 was designed to hold those who prepare registration statements in connection with IPOs—such as the Underwriters, Issuers, and Individual Defendants here—to a stringent standard of liability for *any* material misrepresentations contained in those statements, although certain Defendants may raise their due diligence as an affirmative defense at trial. Pleading under Section 11 is governed solely by Rule 8 because fraud is not an element of a Section 11 claim.[91]

B. The Proper Role of the Stay.

Section 21D(b)(3)'s stay of discovery is closely tied to Section 21D(b)(2)'s requirement that plaintiff plead a "strong inference" of intent; put simply, the stay was intended to enforce the PSLRA's requirement of a highly particularized pleading of fraud. In contrast, to reiterate, under Rule 8 of the Federal Rules of Civil Procedure, which applies when special pleading provisions are not applicable, the plaintiff need only plead "a short and plain statement of the claim showing that the pleader is entitled to relief" and "a demand for the relief sought." Thus, in a Section 11 case, if the plaintiffs plead, on information and belief, that their shares do satisfy all standing requirements, including that the shares are traceable to the registration statement, this should be sufficient to satisfy Section 21D(b)(3)'s requirement at this stage. Proof of plaintiff's contention that it can trace its shares should not be necessary at this stage (although, after discovery, defendants may be entitled to summary judgment if such proof is still lacking).

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[90] Fed. R. Civ. P. 9(b) ("In alleging fraud or mistake, a party must state with particularity the circumstances constituting fraud or mistake. Malice, intent, knowledge, and other conditions of a person's mind may be alleged generally.").

[91] *In re* Initial Pub. Offering Sec. Litig., 241 F. Supp. 2d 281, 296 (S.D.N.Y. 2003); *see also* Degulis v. LXR Biotechnology, Inc., 928 F. Supp. 1301, 1310 (S.D.N.Y. 1996) ("Fraud is not an element in Section 11 [claims] … only a material misstatement or omission need be shown to establish a *prima facie* case, and scienter need not be alleged."); Herman & MacLean v. Huddleston, 459 U.S. 375, 382 (1983) ("Although limited in scope, Section 11 places a relatively minimal burden on a plaintiff … If a plaintiff purchased a security issued pursuant to a registration statement, he need only show a material misstatement or omission to establish his prima facie case.").

Nor is this unfair to the defendant, because such discovery places little burden on the defendant, as the necessary information will normally be available from FINRA. FINRA's Consolidated Audit Trail tracks stock movement and identifies the broker-dealers handling the orders, thus enabling regulators to follow the flow of stock from the registration statement to the current holders.

For purposes of class certification, all that should similarly need to be demonstrated is that the lead plaintiffs hold registered shares and thus have standing so that they can adequately represent the other class members. In the event of a settlement or trial, persons who are unable to trace their shares (and thus lack standing) should be denied damages, and the Claims Administration, guided by any settlement agreement, could easily handle this process. Any settlement can also be structured so that defendant's liability is reduced by the claims of class members who cannot trace their shares and are disqualified at this damage calculation stage (that is, any recovery that an ineligible class member would have received if this class member had standing will be returned to the defendant and not increase the recovery to the eligible class members).

Defendants will likely disagree and insist that the literal language of Section 21(D)(b)(3) entitles them to a stay "during the pending of any motion to dismiss," even though their motion has nothing to do with inadequate pleading of intent (which was the justification advanced in the legislative debate over the PSLRA). Knowing that a motion to dismiss in a Section 11 case is unlikely to succeed, defendants may delay in filing any such motion in order to delay discovery. This will slow the action down and thereby raise the costs (and possibly lower the return) to the plaintiffs.

Here, the court has at least three options: first, it can give expedited attention to the motion to dismiss. If it decides to grant the motion, plaintiffs are not unduly prejudiced by the denial of discovery, as motions to dismiss are required to assume the accuracy of the facts alleged by the non-moving party. If, in contrast, the court denies the motion to dismiss, plaintiffs are now free to proceed with discovery.

Second, the plaintiff may, itself, file a motion under Section 21D(b)(3), asking the court to permit discovery "to prevent undue prejudice" to it.[92]

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[92] The "undue prejudice" standard is typically construed as "improper or unfair treatment amounting to something less than irreparable harm." Texas Pac. Land Tr. v. Oliver, No. 3:19-CV-1224-B, 2019 WL 3387767, at *4 (N.D. Tex. Jul. 26, 2019). This does not include the inherent delay in the discovery stay, as that prejudice is "neither improper nor unfair." *In re* Cassava Scis., Inc. Sec. Litig., No. 1:21-CV-00751-DAE, 2023 WL 28436, at *2 (W.D. Tex. Jan. 2, 2023). While this is a high bar, courts have granted exceptions to PSLRA's discovery stay in a variety of settings. The most common is to allow the plaintiff in a pending securities fraud lawsuit to receive "certain documents and materials" already produced to regulators and other parties. *See, e.g., In re* WorldCom, Inc. Securities Litigation, 234 F.Supp.2d 301 (S.D.N.Y. 2002). This type of request is especially compelling when the stay puts plaintiffs at a disadvantage "in a rapidly

We believe that such a motion should presumptively be granted if defendants are contesting issues unrelated to Section 21D(b)(2). The purpose of Section 21D(b)(2)'s stay of discovery was to protect defendants from burdensome discovery in cases where the plaintiff had not adequately pled particularized evidence giving rise to a "strong inference" of fraud. Thus, if the defendant were contesting an issue as to extraterritoriality or the statute of limitations, the delay to the plaintiff results in "undue prejudice" to it because Section 21D(b) is focused on a very different issue that is not legitimately implicated here.[93] Although sparse, the case law supports this position, as we next explain.

Immediately after the PSLRA was adopted, courts considered whether the case law surrounding limited jurisdictional discovery survived the discovery stay. One solution courts adopted was to incorporate the existing discussion of pre-MTD jurisdictional discovery into the statutory language. In one case, a court considered whether denying a motion for that limited jurisdictional discovery would result in "undue prejudice."[94] In another case,

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shifting landscape." *Id* (noting plaintiffs' chances of recovery/settlement are unfairly hampered if the stay remains in place). In addition to the settlement context, courts have used this reasoning when a particular remedy may be useless after a delay. *See* Ashford Hosp. Tr., Inc. v. Cygnus Cap., Inc., No. 3:21-CV-00125-M, 2021 WL 3631142, at *5 (N.D. Tex. Feb. 18, 2021) ("[G]iven Plaintiff's pending motions for injunctive relief and the fact that Plaintiff's annual meeting will likely be held in the spring of 2021, Plaintiff will be unduly prejudiced if expedited discovery is not allowed."). Further, stays for undue prejudice are often granted in the bankruptcy context. *In re* Delphi Corp., No. 05-MD-1725, 2007 WL 518626, at *1 (E.D. Mich. Feb. 15, 2007). Courts are also moved by this request when it is made from "necessity to preserve evidence," such as when the company is undertaking a wide-ranging corporate reorganization. *See, e.g., In re* Royal Ahold N.V. Sec. & Erisa Litig., 220 F.R.D. 246, 247 (D. Md. 2004) (arguing that getting this evidence "could help the plaintiffs identify other specific materials that may be at risk of loss"). Similarly, courts may partially lift the PSLRA stay if necessary to preserve evidence. The moving party must show that the loss of evidence is "imminent as opposed to merely speculation." *In re* Smith Barney Transfer Agent Litig., 2012 WL 1438241 at *3 (S.D.N.Y. Apr. 25, 2012). This consideration often intertwines with the undue prejudice question. For example, a court in Ohio granted the plaintiffs' motion after a key witness, who was also a confidential source for a reporter, died from a gunshot wound. *In re* FirstEnergy Corp. Sec. Litig., No. 2:20-CV-03785, 2021 WL 2414763, at *6 (S.D. Ohio June 14, 2021) (determining that this event poses "unique prejudice").

[93] *See* H.R. Rep. No. 104-369, at 31 (1995) (Conf. Rep.), *reprinted in* 1995 U.S.C.C.A.N. 730 ("Congress has been prompted by significant evidence of abuse in private securities lawsuits to enact reforms to protect investors and maintain confidence in our capital markets. The House and Senate Committees heard evidence that abusive practices committed in private securities litigation include: (1) the routine filing of lawsuits against issuers of securities and others whenever there is a significant change in an issuer's stock price, without regard to any underlying culpability of the issuer, and with only faint hope that the discovery process might lead eventually to some plausible cause of action; (2) the targeting of deep pocket defendants, including accountants, underwriters, and individuals who may be covered by insurance, without regard to their actual culpability; (3) the abuse of the discovery process to impose costs so burdensome that it is often economical for the victimized party to settle; and (4) the manipulation by class action lawyers of the clients whom they purportedly represent."); *see also* Wendy Gerwick Couture, *Cyan, Reverse-Erie, and the PSLRA Discovery Stay in State Court*, 47 Wash. U. L. Q. 21, 22–23 (2019) (summarizing the purpose and intent of PSLRA's discovery stay as limited to the prevention of "(1) fishing-expedition discovery and (2) extortive discovery.").

[94] *In re* Baan Co. Sec. Litig., 81 F. Supp. 2d 75, 83 (D.D.C. 2000) (noting that the request "simultaneously satisfies the statute and the case law"). Later courts denying these requests

a court discussed in depth the PSLRA's heightened standard for pleadings in a securities fraud lawsuit before staying *the motion to dismiss pending jurisdictional discovery.*[95] The court concluded that the plaintiff's contentions "raise a colorable showing of personal jurisdiction sufficient to allow jurisdictional discovery."[96] Although issues of tracing go more to standing than jurisdiction, both standing and jurisdictional issues are unrelated to "merits" issues, such as plaintiff's claims of misconduct by the defendant. Further, FINRA, and not the defendants, will be the primary party from whom discovery will be sought, thus implying that the defendant is not directly prejudiced.

A third and final possibility is that the plaintiff could file its Section 11 action in state court and assert that the discovery stay in section 21D(b)(3) does not apply in state court. [97] Some state courts have so held but in

similarly employ the "undue prejudice" standard. *See, e.g.,* Szulik v. TAG Virgin Islands, Inc., 783 F. Supp. 2d 792, 797 (E.D.N.C. 2011) (describing the PSLRA as "an alternate basis for denying Plaintiffs' request"); Hallisey v. Zuckerberg, No. 18-CV-01792-HSG, 2018 WL 3474172, at *2 (N.D. Cal. July 19, 2018) (denying a request for jurisdictional discovery by declining "to determine now whether a basis for lifting the PSLRA stay in part could develop later").

[95] *In re* Fisker Auto. Holdings, Inc. S'holder Litig., No. CV 13-2100-SLR, 2015 WL 6039690, at *23 (D. Del. Oct. 15, 2015).

[96] *In re* Fisker, 2015 WL 6039690, at *22.

[97] One approach is to attach related state common-law claims, which are not per se subject to a discovery stay. The question then becomes, does the PSLRA discovery stay apply to cases with both state common-law claims and federal securities claims? There is a thread of cases allowing discovery on related common-law state claims, despite potential application of the PSLRA. *Tobias*, decided in 2001, is the early influential case. There, plaintiffs filed suit alleging violations of the Exchange Act and state common law claims for fraud, breach of contract, conspiracy, and tortious interference with contract. The court allowed discovery on the common law claims to proceed, holding that the automatic stay "cannot prohibit discovery on non-fraud common law claims arising under the Court's diversity jurisdiction." Tobias Holdings, Inc. v. Bank United Corp., 177 F. Supp. 2d 162, 169 (S.D.N.Y. 2001). This case was supported, but distinguished, in *Purizer*. Plaintiffs had similarly alleged violations of the Exchange Act and Rule 10b-5, but alleged common law fraud and negligent misrepresentation. The court applied the PSLRA's discovery stay, noting that "*Tobias Holdings* does not stand for the proposition that if the basis of federal jurisdiction over state law claims could be found in diversity of citizenship, even where the state claims are closely tied to the federal claims, the PSLRA's discovery stay does not apply. Rather, it stands for the proposition that state law claims that are distinct from the federal securities claims—such as would be expected to be found where the basis of jurisdiction over the state law claims relies solely on diversity of citizenship—are not subject to the discovery stay." Angell Invs., L.L.C. v. Purizer Corp., No. 01 C 6359, 2001 WL 1345996, at *1 (N.D. Ill. Oct. 31, 2001). This distinction centered on the goal of the PSLRA—to avoid high discovery costs in frivolous suits—and argued this is not hampered when discovery is allowed in distinct claims. The court, however, worried about creating an easy out (the assertion of state common law claims) and limited the holding in *Tobias*. This holding has also been limited to claims brought under diversity. Courts considering federal claims along with state law claims brought under *supplemental jurisdiction* without an independent jurisdictional basis have applied the PSLRA's discovery stay to all claims. Spears v. Metropolitan Life Insurance, No. 2:07–CV–00088–RL–PRC, 2007 WL 1468697 (N.D. Ind. May 17, 2007). Despite these limitations, plaintiffs have still found success. Given *Tobias*'s narrowing, most successful claims feature very similar fact patterns. *See e.g.,* Seippel v. Sidley, Austin, Brown & Wood LLP, No. 03 CIV.6942(SAS), 2005 WL 388561, at *3 (S.D.N.Y. Feb. 17, 2005) ("As in Tobias Holdings, the Court has an independent basis for jurisdiction over the Seippels' state law

the *Pivotal Software* case,[98] the Supreme Court granted certiorari to resolve this issue. Because the parties in that case settled after cert was granted, resolution was not achieved. Nonetheless, we believe the probability was high that the Court would have upheld the discovery stay as applicable in state court. In any event, the cost to the plaintiff of suing in state court is that it cannot assert its Rule 10b-5 claim in the same action, because federal courts have exclusive jurisdiction over claims arising under the Securities Exchange Act.[99] Hence, we regard this option as inferior and bordering on illusory.

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claims, which do not arise under the federal securities laws. The policies behind the PSLRA's discovery stay provisions do not apply here."). This success has not been universal; there have also been courts which have disagreed with the holding in *Tobias*. *See, e.g.,* Union Cent. Life Ins. Co. v. Ally Fin., Inc., No. 11 CIV. 2890 GBD JCF, 2012 WL 3553052, at *1 (S.D.N.Y. Aug. 17, 2012) (describing *Tobias* as "an outlier"); Gardner v. Major Auto. Companies, No. 11-CV-1664 FB, 2012 WL 1230135, at *5 (E.D.N.Y. Apr. 12, 2012) ("this Court respectfully disagrees with the reasoning set forth in *Tobias*). This trend has become more common in recent years. *See* Wayne Jacob's Smokehouse Distribution, LLC. v. Munford, No. CV 18-5942-WBV-JVM, 2020 WL 588028, at *4 (E.D. La. Feb. 6, 2020) (recognizing *Tobias* but distinguishing on the facts); RSMCFH, LLC v. FareHarbor Holdings, Inc., No. CV 18-00348 LEK-WRP, 2019 WL 13163792, at *3 (D. Haw. July 3, 2019) (considering *Tobias* before explicitly rejecting it); Barney v. Zimmer Biomet Holdings, Inc., No. 3:17-CV-616-JD-MGG, 2018 WL 11407332, at *4 (N.D. Ind. Aug. 21, 2018) (recognizing *Tobias* but distinguishing on the facts). In fact, courts in the Ninth Circuit have completely rejected the case and its line of reasoning. *See* Salameh v. Tarsadia Hotels, No. 09CV2739 DMS (BLM), 2012 WL 12941995, at *4 (S.D. Cal.) (holding that "the approach adopted in [Tobias] and similar cases, where discovery was allowed to proceed in pendent state claims, has been rejected in the Ninth Circuit"). Their underlying concern is that the stay "would be rendered meaningless if securities plaintiffs could circumvent the stay simply by asserting pendent state law claims in federal court in conjunction with their federal law claims." SG Cowen Sec. Corp. v. U.S. Dist. Court for N. Dist. of Cal., 189 F.3d 909, 912-13 (9th Cir. 1999). To that end, Ninth Circuit doctrine now explicitly states that "the independent jurisdiction of the state claims does not affect the clear legislative intent of the PSLRA's discovery stay." RSMCFH, LLC v. FareHarbor Holdings, Inc., No. CV 18-00348 LEK-WRP, 2019 WL 13163792, at *3 (D. Haw. July 3, 2019). As courts have moved away from awarding discovery when there are both state and federal claims, defendants have started to target plaintiffs pleading only state common law claims. They have argued that the PSLRA stay applies because plaintiffs *should have plead* federal securities claims. Courts have typically rejected this argument. For example, in *MXI Corp*, a court concluded "that application of the PSLRA stay provision [to RICO claims defendants argued should have been federal securities claims] would be improper." Martinez v. MXI Corp., No. 315CV00243MMDVPC, 2015 WL 8328275, at *3 (D. Nev. Dec. 8, 2015). Similarly, in *Koock*, defendants tried to argue that the PSLRA should apply to plaintiffs' claims of negligence and negligent misrepresentation—two state common law claims filed in federal court under diversity. The court rejected this reasoning and allowed discovery for the purely state law causes of action. *Id.* at *2. It did include a word of warning, noting that "securities claims dressed up as tort actions" would not be as lucky. *Id.* As long as the state common-law claims are truly distinct, plaintiffs only pleading state common-law claims will likely be able to reach discovery.

[98] Pivotal Software, Inc. v. Superior Court of California, 141 S. Ct. 2884 (2021). (granting Cert). The petition was later dismissed after a settlement. *See* Pivotal Software, Inc. v. Superior Court of California, 143 S. Ct. 763 (2023).

[99] This distinction between the Securities Act (which allows actions under it to be filed in state court) and the Securities Exchange Act (which does not) is discussed in *Cyan, Inc. v Beaver Cnty. Emps. Ret. Fund*, 138 S. Ct. 1061 (2018).

C. Combining Section 11 with a Rule 10b-5 Action

A recurrent problem under Section 21D(b) arises when plaintiffs file a class action that pleads both fraud (under Rule 10b-5) and negligence (under Section 11 or 12(a)(2)). Plaintiffs presumably prefer this tactic because the damages available under Section 11 are often much less than the damages obtainable in a Rule 10b-5 action.[100] But can plaintiffs use discovery under Section 11 to gather information for purposes of meeting Section 21D(b)(2)'s higher pleading standard for Rule 10b-5 cases? Possibly, the fear that they might do so may have made federal courts skeptical of such combined Section 11/Rule 10b-5 cases. In response, the Second Circuit and the Ninth Circuit developed what became known as the "sounds in fraud" doctrine.[101] Under this doctrine, if the overall tenor of the complaint "sounds in fraud," the stay will be applied to both causes of action. The application of this test is not easy to predict. Even when the plaintiff attempts to separate its fraud theory (i.e., Rule 10b-5) from its non-fraud theory (i.e., Section 11), some courts will determine that the plaintiff has alleged an overall court of conduct "grounded" in fraud and apply the stay on discovery to both theories.[102] Other courts have ruled that, to avoid the stay, the two different claims have to be each supported by an independent narrative.[103] Thus, for example, if plaintiffs plead, with some particularity, that the defendants failed to engage in any serious due diligence investigation, these courts will accept the pleading of the non-fraud theory and not apply the stay to it.

Plaintiffs could, of course, file separate actions, one based on Rule 10b-5 and one based on Section 11. If both are adequately pled, they could both survive and possibly be later consolidated for trial. Plaintiffs' attorneys are not happy with this approach, however, because it would involve two separate battles over the appointment of the lead plaintiff and class counsel. That, however, is not our concern. From our perspective focused on preserving Section 11 as a deterrent, separating the Section 11 action from the Rule 10b-5 action may be the safest strategy.

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[100] *In re* Baan, 81 F.Supp. at 83.

[101] *See, e.g.*, Randall v. Chang, 355 F.3d 164 (2d Cir. 2003); *see also* Vess v. Ciba-Geigy Corp. USA, 317 F.3d 1097 (9th Cir. 2003).

[102] *See, e.g.*, *In re* Ford Fusion & C-Max Econ. Litig., 2015 U.S. Dist. LEXIS 155383 (S.D.N.Y. Nov. 12, 2015).

[103] Marc I. Steinberg & Brent A. Kirby, *The Assault on Section 11 of the Securities Act: A Study in Judicial Activism*, 63 Rutgers L. Rev. 1, 41 (2010) ("Based on the Eleventh Circuit's approach, Section 11 claims properly pled in accordance with Rule 8(a)(2) will fail if the court believes they are sufficiently related to an alternately pled Section 10(b) claim."); *See* Wagner v. First Horizon Pharm. Corp., 464 F.3d 1273, 1278 (11th Cir. 2006) (holding if "the plaintiffs are claiming that the § 11 or § 12(a)(2) misrepresentation is part and parcel of a larger fraud, then [Rule 9(b)'s)] protective purpose attaches").

Conclusion

One of the attractions of our suggested approach is that it does not require legislation or even significant new SEC rules. If the court having a Section 11 action before it can be asked to schedule an early hearing at which it schedules any motion to dismiss that defendants wish to bring and denies a dilatory defendant the right to file a later such motion, then defendants cannot delay or prevent the plaintiffs from obtaining discovery. Because a motion to dismiss in a Section 11 case is less likely to be successful, plaintiffs will experience little delay. The one juncture that remains critical is FINRA's readiness to give litigants access to its Consolidated Audit Trail System, and here the SEC can likely encourage FINRA without adopting any rules.

Indeed, while the SEC does not have direct regulatory authority over Section 11 claims (unlike, for example, Section 10(b) which is expressly conditioned on "such rules and regulations as the [SEC] may prescribe"), Section 28 of the Securities Act grants the SEC general exemptive authority to the extent that any such exemption "from any provision or provisions of this title or of any rule or regulation issued under this title, to the extent that such exemption is necessary or appropriate in the public interest, and is consistent with the protection of investors."[104] In theory, the SEC could adopt a rule under this section which explicitly provides that standard accounting methods shall satisfy Section 11's tracing requirement. Perhaps a desirable approach would be for the SEC to produce a whitepaper or other interpretive guidance which makes clear its views that accounting methods are appropriate to apply to conduct tracing in Section 11 cases. While courts will ultimately have to determine the admissibility of such evidence, there is no doubt the judiciary would benefit from the SEC's views on the topic.

As for discovery, here too the SEC can play a role. While the SEC's final rules governing the Consolidated Audit Trail do provide that information held by the CAT, including customer identifying information, is discoverable,[105] the SEC could make clear to FINRA that these records must be produced to private litigants in the course of Section 11 litigation. Similar records are also collected by FINRA in a form known as the Electronic Blue Sheets, which are also subject to subpoena. The SEC could similarly clarify that these should be produced without delay to private litigants. These are the sort of actions that the SEC could take immediately to ensure that *Slack* and its progeny do not result in a complete loss of standing, thereby leading to the death of Section 11 litigation. Seeking to preserve Section 11 would be fully consistent with the SEC's mission of promoting investor protection.

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[104] 15 U.S.C. § 77z–3.

[105] Joint Industry Plan; Order Approving the National Market System Plan Governing the Consolidated Audit Trail, Rel. No. 34-79318, at *107, Nov. 15, 2016, https://www.sec.gov/files/rules/sro/nms/2016/34-79318.pdf [https://perma.cc/5Y4Y-4ETW] ("[T]he CAT NMS Plan provides that the confidentiality provision does not restrict disclosures required by: . . . an order, subpoena or legal process").

Appendix A: Implementing Tracing Using Accounting Methods

One of us, Professor Mitts, has developed a patent-pending methodology to enhance the computational efficiency of applying the sort of tracing using accounting methods described herein. What follows is a brief description of the methodology.[106]

The starting point for the methodology is that many computing problems, including tracing, involve transforming input into output in a way that is irreversible, making it impossible to "reverse engineer" the output to determine how much came from one input as opposed to another. When it is impractical to decompose the output of a computer process into inputs, an alternative is to engage in *attribution* after the fact—that is, to estimate the input composition at each stage of the transformation from input to output. A large literature in machine learning employs "sensitivity analysis" to determine the influence of various inputs on the output of a neural networks, which amounts to perturbing (modifying) inputs to determine how much of the output changes as a result.

One problem with sensitivity analysis as an attribution method is that it may yield contradictory conclusions over time. A lack of time consistency in attribution can make it impossible to use attributed data in real-world applications. It may be necessary to attribute data transmitted by a network node that originated from isolated child nodes. Consider a blockchain transfer of a single block representing entitlements held by multiple off-chain beneficiaries. To preserve the allocations of off-chain entitlements over subsequent transfers of homogeneous blocks, it is necessary to consistently attribute each beneficiary's entitlement over time.

In some cases, given a sequential record of data messages, brute force attribution may be infeasible or even impossible. Mechanically tracing each message queue often has superlinear complexity, wasting CPU cycles, power, I/O and network bandwidth. Any of these iterations may fail if there is a contradiction along the way, such as a node belonging to two disjoint networks that transmits a single confounded output that is both attributed and not attributed to a given input depending on which subnetwork is considered. In other cases, output paths form circular loops, where inputs and outputs are contemporaneously fed into each other. A particularly difficult problem is ensuring time-consistency, that is., that the initial distribution of inputs such as the fraction of attributed copyrighted text is preserved at each step of the attribution sequence.

Specifically, the method is one of queue traversal, which has several components but ultimately sets out two exceptionally novel inventions. The first is to substantially reduce the CPU cycles, processing time and network

[106] Post Hoc Attribution of Homogenizable Sequential Data, Prov. App. No. 53/561,668 (Oct. 19, 2023). The material in this Section is adapted from Appendix A to the application.

traffic required to engage in time-consistent attribution by tracking, for each network node traversed, only those other nodes which require reiteration. The second is to reconcile inconsistencies between attribution over isolated sub-networks by generating attribution deficits which track the extent to which attribution in one network is inconsistent with attribution in another network. Subnetwork attributions are balanced when adding together attributions and attribution deficits, bounding the range of disagreement between networks.

Queue traversal method. The following flowchart describes the method:

Each step of the method performed by the CPU is as follows:

> *1.* ***Eliminate circular paths***. A circular path occurs when output data is sent from one node to others and ultimately back to the originating node. Because circular paths contain no additional information and waste CPU cycles, these paths are removed by reducing data transferred along each step of the circular path by the volume of circularity. For example, if node 1 sends 100 bytes of data to node 2, which sends 50 bytes of data to node 3, which sends 25 bytes of data to node 1, the entire chain is reduced by the excess circularity of 25 bytes. The elimination of circular paths does not lead to information loss when the output data is homogenizable.
>
> ***2. Net offsetting messages within node pairs***. Consider a pair of nodes which send homogenizable data messages to each other. Prior to attribution, these offsetting messages are netted. For example, if the data indicate that A sent 100 bytes to B and B sent 50 bytes to A, the attribution process considers only the net 50 bytes transmitted from A to B. Netting reduces computational time, I/O resources and network traffic dramatically.
>
> ***3. Distribute nodes to parallel processing units***. To reduce CPU processing time and network traffic, node-specific iterative attribution is performed in parallel across nodes.

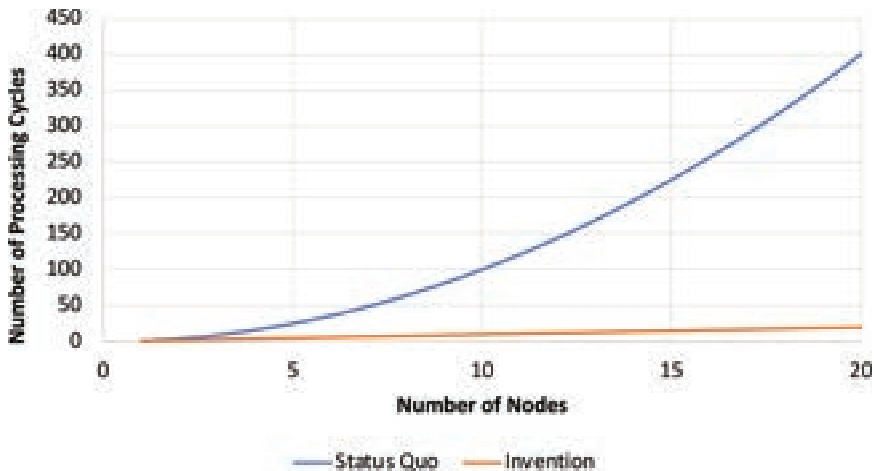
Node-specific iterative attribution. Maintaining time consistency across nodes iterating over message queues in parallel ordinarily requires superlinear complexity. Consider a simplified example. Suppose there are three nodes: A, B, C, and two possible inputs: 0 and 1. We observe three data records: (i) the entirety of A's output arose from input 1; (ii) A transmitted the entirety of its output to B; (iii) B transmitted the entirety of its output to C.

In the initial state, the data transferred to B and C lack attribution because while they are aware of the origin of the data transferred to them (A and B, respectively), those nodes are unaware that A has attributed its output to input 1. B only learns that information in the second iteration and C in the third. Under the pre-invention status quo, no single node is aware of the extent to which its own updates necessitate reattribution at other nodes, so every attribution at a single node requires total reattribution of future nodes, leading to excessive CPU cycles, I/O and network traffic. In this example, that would imply three attribution iterations: (i) A's output (to B) is attributed to input 1, (ii) B's output (to C) is attributed to input 1, and (iii) C's data is attributed to input 1.[107] In general, for each of the *m* updates to each node, all of the *n* nodes must again be traversed *m* times. Moreover, these updates must be in serial, defeating any benefits to parallel processing. In the prior example, A, B and C are updated each iteration, yielding 9 total iterations.

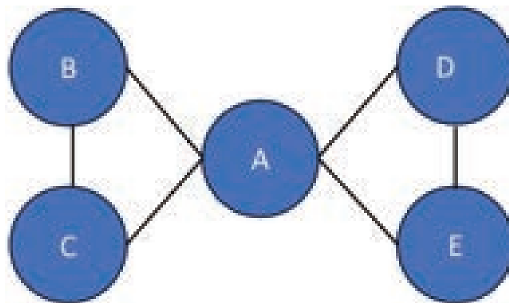
A major reduction in CPU processing time, I/O and network traffic can be achieved by tracking, for each node, ***only those destination nodes which require reiteration***. This is accomplished by maintaining a master list to which each node pushes updates, while other nodes monitor that master list in parallel and re-iterate over its message queue only as needed. Checking the master list requires only one processing cycle, so for each of the *m* updates to each node, each other node need only check the master list one time and update that node if, and only if, there has been a change in attribution of data sent to that node. All of these updates occur in parallel across nodes, leading to a substantial decrease in processing cycles. In the prior example, A, B and C are updated only once, yielding 3 total iterations.

The following figure compares the number of processing cycles between the status quo and the invention in the simplified setting, like the prior example, of sending a single output over *n* chained nodes, when each node only requires one update. In that case, the number of cycles required is proportional to quadratic complexity under the status quo vs. linear complexity under the invention. Similar conclusions obtain (though different in magnitude) when considering data message queues of arbitrary length.

[107] There is likely to be an initial iteration which would remain constant regardless of the length or number of nodes.



Generate attribution deficits to reconcile contradictions. It may be the case that the data imply contradictory conclusions regarding output attribution between subnetworks of isolated child nodes. Consider the following simplified example of a network structure:



In this example, the A-B-C and A-D-E subnetworks are not connected to each other, and no information is shared between those networks, that is, input and output attribution are independent of each other. Now suppose the observed data indicate that B and D generated the entirety of their output from inputs 0 and 1, respectively, and that each transferred the entirety of their output to A, which transferred the entirety of its output to C and E. In that case, when viewing the A-B-C subnetwork, output transferred by A to node C was attributed to input 0; whereas when viewing the A-D-E subnetwork, the output transferred by A to node E was attributed to input 1. But this yields an attribution inconsistency between subnetworks: under one subnetwork, A is attributed with input 0 (prior to the transfer to node C) and under another subnetwork, A is attributed with input 1 (prior to the transfer to node E). Contradictions like these can cause wasted loops and CPU cycles when attempting to reconcile attributions.

The methodology reconciles attribution contradictions by generating ***attribution deficits*** that track the extent to which attribution in one network is inconsistent with attribution in another network. In the prior example, an attribution deficit would be generated for Node A for each of inputs 0 and 1, reflecting the inconsistencies for the A-D-E and A-B-C subnetworks, respectively. The following table shows the attributions and attribution deficits for Node A in this example (prior to the transfers to nodes C and E):

	Subnetwork			
	A-B-C		**A-D-E**	
	Attribution	**Deficit**	**Attribution**	**Deficit**
Input 0	1	0	0	1
Input 1	0	1	1	0

As this example illustrates, attributions are ***balanced*** across subnetworks when adding together attributions and attribution deficits. Moreover, attribution deficits can be transferred within a subnetwork, allowing the consistent attribution of inputs to outputs based on information contained within any given subnetwork, regardless of whether that subnetwork contains a given input or not. In this example, attribution deficits transferred within the A-B-C subnetwork reflect attribution under information contained in a different subnetwork, the A-D-E subnetwork. The transfer of attribution deficits allows for tracking how attribution information which originates in the A-D-E- subnetwork might propagate within the A-B-C subnetwork.

Use of attribution metadata. There are several ways that time-consistent attribution metadata may be deployed to enhance the utility of the sort of black-box sequential processes discussed here. One is to reprocess inputs subject to certain attribution-based constraints at the beginning, intermediate or final nodes. For example, a GPT-4 large language model could be retrained on copyright attribution metadata to consistently limit the model's use of copyrighted text at different points in the training process. Another possibility is to employ attribution metadata in dimension reduction algorithms to improve the interpretability of machine learning models. While dimension reduction traditionally seeks to identify inputs which best *predict* a given outcome, attribution information reveals those inputs which have the largest *constitutive* role in the outcome. Constitutive role can be incorporated in model selection as a criterion, namely, to explain what information a machine learning model is actually using.

Yet another possibility is to reallocate inputs based on attribution metadata after the conclusion of the computing process. Suppose that inputs are scarce resources, such as off-chain entitlements underlying blocks transferred between nodes on the blockchain. Off-chain computing systems could use attribution information derived from blockchain transfers to reallocate those

entitlements between off-chain beneficiaries. Allocative methods could similarly utilize attribution deficit metadata to determine which claims to scarce resources are conflicting as opposed to non-conflicting. Applications of allocative processes which would benefit from attribution metadata extend to tracing transfers of financial instruments through commingled accounts which hold entitlements in "fungible bulk" form.