

Underestimation of Securities Fraud Aggregate Damages Due to Inter-Fund Trades

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Abstract

Aggregate damages in class action securities cases estimated using standard methodologies and public volume data may be understated due to the frequent occurrence of inter-fund trades. Inter-fund trades are internal crossing trades between funds within the same fund family and are one of the few instances of trading transactions that are not reported publicly. Consequently, while inter-fund trades show up in submitted claims they are omitted from the public trade volume data generally used to estimate aggregate damages. Using actual claims data obtained from a claims administrator in a recent case, we find a significant number of damaged shares attributable to inter-fund trades, for which traditional damage estimation models do not account without an adjustment to the models' trading volume input. Our findings have implications for how aggregate damages should be estimated and call for policy reform in the reporting of inter-fund trades.

I. Introduction

The public perception that securities fraud is an all too common occurrence in modern financial markets is borne out by empirical data. Estimates of the cost associated with such white-collar crime in the United States range from \$200 billion to \$600 billion annually, according to the Association of Certified Fraud Examiners (Schnatterly, 2003). Class action securities litigation is an important mechanism used to compensate investors injured by securities fraud. Because of their frequency and the sums of money involved, these lawsuits have significant impacts on financial markets. According to the Stanford Law School Securities Litigation Clearinghouse and Cornerstone Research, there were 452 class action securities cases filed from the beginning of 2010 to June 30, 2012; and in 2011 alone, securities class action settlements totalled more than \$1.4 billion.¹

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¹See Ryan and Simmons (2012a, 2012b).

Because most class action securities cases do not go to trial, but rather are settled via negotiation or mediation,² accurate estimation of aggregate damages by both the plaintiffs and defendants is an integral step in the execution and resolution of these cases.³ A small set of similar models is generally used to estimate aggregate class-wide damages. See, for example, Bassin (2000), Barclay and Torchio (2001), Crew, et al., (2001), and Finnerty and Pushner (2003), for discussions of the models generally used.

Because many investors neglect to submit claims to recover damages in securities cases, there is a tendency for claimed damages to fall below the estimate of damages actually suffered.⁴ However, in recent years, a number of mutual funds were called to task for not participating in the claims process, leaving investors' money on the table.⁵ It is widely believed that claim participation rates have consequently increased in recent years, thereby reducing this buffer depressing claimed damages relative to actual damages. But, claim participation cannot be expected to be 100%. Therefore, it remains puzzling when claimed damages exceed estimated damages. There must be some factor unaccounted for in the damage estimation models that explains the discrepancy. Evidence we examined points to a problem in the public trading volume data.⁶

Regardless of the specific model adopted by experts to arrive at aggregate damage estimates, publicly reported market trading volume is perhaps the most crucial input. In essence, different trading models determine the proportion of damaged shares out of the total number of shares traded on any given day during the class period. Inter-fund trades (internal crossing trades between funds within the same fund family) are one of the few instances where actual trading transactions are not reported publicly (see, e.g., McInish, 2002, and Conrad, Hu, and Wahal, 2012). This will cause the publicly reported market trading volume to be lower than the actual trading volume, which, in turn, will bias aggregate damage estimates downwards.

²According to a tally maintained by Adam Savett of txtcapital, since enactment of the Public Securities Litigation Reform Act in 1995, only 22 class-action securities cases have been tried to conclusion. See "Securities Class Action Trials in the Post-PSLRA Era," by Adam Savett, txtcapital, 24 July 2012, available at <https://www.box.com/shared/xxav75dzpf>.

³Some Federal circuits prefer that damages be computed on a per-share basis, with an understanding that aggregate damages will be determined via the claims process. However, other circuits have accepted and relied on testimony about aggregate damage estimates, and generally, plaintiffs and defendants are interested in such estimates at various stages in the litigation, especially during settlement negotiations.

⁴See, for example, Declaration of R. Alan Miller in *Caristo, et al. v. Premier Technologies, Inc. et al.* (2002) and Allen (2008).

⁵See, for example, *William Stegall, et al. v. Charles L. Ladner, et al.*, (2005).

⁶It is worth noting that there could be many reasons why volume-based damages models can fail to reflect actual aggregate damages. Even if reported daily volume data were complete, volume-based models make assumptions about when specific shares are purchased and sold because parties to a securities class action generally lack detailed information on class members' actual purchases and sales during the class period. And, using 13-F data to estimate the prices at which specific financial institutions purchased and sold, are only available quarterly and can introduce additional imprecision into damages estimates. Form 13-F is a quarterly report of equity holdings by institutional investors with at least \$100 million in equity assets under management, as required by the United States Securities and Exchange Commission (SEC).

We obtain claims data from a claims administrator for a case where the ac-damaged shares. We use a matching algorithm to identify inter-fund trades in the claims data. As a robustness check, we cross-check inter-fund trades identified by our algorithm in the claims data with the inter-fund trades we identified in a different institutional trading dataset. This comparison confirms that the inter-fund trades identified by us in the claims data are indeed inter-fund trades.

We find that there are significant inter-fund trades present in claimed damaged shares, representing about 9% of total claimed damaged shares. Interestingly, there are extreme days where the trading volume in the claims data is *higher* than exchange-reported daily volume. On those days, we find spikes in inter-fund trades in the claims data. Taken together, our empirical results show that the underestimation of aggregate damages in securities fraud class action litigations can at least be partially explained by the fact that inter-fund trades are not reported publicly.

Our findings have direct implications for legal practitioners. Since inter-fund trades are not reported, one may need to adjust the publicly reported market volume upwards to arrive at more accurate damage estimates. Our study also has regulatory implications: we believe inter-fund trades should be reported publicly, at least after the fact, to bring more transparency and accuracy to market data.

The remainder of this paper is organized as follows. Section II briefly reviews related literature. Section III describes the data and our algorithm for identifying inter-fund trades, and presents our empirical results. Section IV discusses practical and policy implications of our findings and Section V concludes.

II. Literature Review

Inter-fund cross trading is very much an under-researched area in the academic literature, perhaps due to the lack of readily available data. Using fund return data, Gaspar, Massa, and Matos (2006) infer that mutual fund families transfer performance across member funds to favor those funds with a higher expected contribution to family profits. The authors conjecture that inter-fund trading might be one of such channels for performance transfers within fund families. Conrad, Johnson and Wahal (2003) examine orders executed on *external* crossing systems such as ITG's POSIT and after-hours on the NYSE and Instinet. They find that controlling for security and institution-specific characteristics, total execution costs (the sum of price impact and commissions) of external crosses are about 30 basis points lower than transactions exposed to the market. In a recent working paper, Conrad, Hu, and Wahal (2012) use a proprietary database of trading transactions by institutional investors to identify and analyze *internal* crosses (inter-fund trades) that are never exposed to the external marketplace.

According to Pozen (2002),

[s]uch interfund trades are permitted under SEC rules as long as no commission is paid to any broker and the price at which the trades

are executed correspond to the last independent price at which a trade in the relevant security has been carried out in the trading day; or, if no independent trades have occurred on that day, the price is midway between the highest independent bid and lowest independent offer. Consistent with the approach taken by the SEC to other potential conflict of interest situations, SEC rules governing interfund trading require a fund's board of directors to adopt procedures to govern such trading and to make quarterly determinations that such interfund trades meet the conditions in these rules. (p. 264)

Funds within the same mutual fund families often overlap in asset holdings. Elton, Gruber, and Green (2007) find that as much as 34% of total net assets consist of stocks held in common for funds with the same objective within the family. For funds with different objectives, the median percent of the portfolio held in the same securities is 17% inside the family (overlap in stocks held by funds within the same fund family) compared to 8% outside the family (overlap in stocks held by funds across different fund families). Hence there are many potential opportunities for funds within the same family to cross trade with each other. The Securities and Exchange Commission (SEC) allows such cross trading within fund families through exemptions provided under rule 17a-7 under the Investment Company Act of 1940. For more institutional details about inter-fund trades or internal crosses, see McInish (2002), Pozen (2002), Department of Labor (2006), and Conrad, Hu, and Wahal (2012).

These inter-fund trades are not reported to exchanges, and therefore are not included in publicly reported daily trading volume. This omission can be significant, since large fund families execute many of their trades via inter-fund trading. McInish (2002) states that "Fidelity Investments manages more than 150 mutual funds. Conversations with industry executives indicate that perhaps 8% to 10% of equity trades are cross trades at Fidelity." (p. 5)

III. Data and Empirical Results

A. Claims Data and Underestimation of Damages

We obtained claims data from Rust Consulting, Inc., one of the leading claims administrators who implement settlements in class action securities cases. The data are the actual damage claims submitted by investors in the class action lawsuit involving ABC Systems, Inc., (pseudonym for defendant).⁷ While we have data for only one case, our paper is the first study analyzing inter-fund trades using damage claims data.

In this particular case, the actual claimed damages turned out to be higher than the damages estimated by a two-trader proportional trading model of the type and parameterization often used by plaintiffs in the course of litigation and by both plaintiffs and defendants in settlement negotiations and the sub-

⁷Please note that at the request of counsel representing the parties involved in this particular case, we have changed the name of the defendant involved and of the institutional investor claimants who engaged in inter-fund trading. However, the numbers and data are accurate and have not been altered.

sequent design of plans of allocation. Specifically, the two-trader proportional trading model, relying on public volume data, estimated aggregate damages to be \$117,691,638. The estimated number of damaged shares according to the model was 22,534,526. According to the actual claims data, however, claimed damages amounted to \$149,257,263, and the number of damaged shares was 25,585,834. Thus, aggregate claimed damages were 26.8% greater than the model's estimate, and the number of claimed damaged shares was 13.5% higher than the estimate.

B. Identifying Inter-Fund Trades

The claims data contain variables such as a claim number, name and address information, trade date, side (whether it is a buy or sell), number of shares traded, the price of the transaction, and the dollar amount of the transaction. We identify inter-fund trades in claims data through a matching algorithm. We match buy and sell transactions based on the identity of the fund family, and require trade date, share volume, price, and dollar amount to be same for both the buy and the sell transaction. We further require one-to-one matching by removing those transactions with multiple matches. That is, if there is a purchase transaction with three matching sale transactions, we cannot be sure that the purchase was matched with one of the sales, and that the other two sales were performed on the open market. So we choose to eliminate these transactions from identified inter-fund trades. This requirement is conservative in that we may filter out some inter-fund trades. But, on the other hand, it ensures the accuracy of our algorithm.⁸ Our algorithm identified 8.8% of claims transactions to be inter-fund trades, in terms of both total shares and dollar amount traded. In other words, 91.2% of claims transactions were eliminated as non-inter-fund trades.

Table 1
Example of Inter-Fund Trades Identified in Damage Claims Data
(Some identity and address information has been modified.)

Claim Number	Name	Address 1	Address 2
50002312	X Group of Funds	c/o Peter S. Esq.	X Financial Center Yth Flr.
50002314	X Group of Funds	c/o Peter S. Esq.	X Financial Center Yth Flr.

City	State	Zip Code	Trade Date	P/S/U	Quantity	Price	Net Amount
Boston	MA	02111	02/08/07	S	168,900	20.73	\$3,501,297.00
Boston	MA	02111	02/08/07	P	168,900	20.73	\$3,501,297.00

⁸Note that if the same fund buys and sells the same number of shares of the same stock at exactly the same price within the same day, then our algorithm may classify these intra-fund trades as inter-fund trades. Though this is theoretically possible, cases like this should be rare.

An example of inter-fund trades identified by our matching algorithm is presented in Table 1. In this example, X Group of Funds, a large institutional investor in the Boston area, purchased and sold 168,900 shares (same share volume) of ABC Systems' stock on February 8, 2007 (same trade date) at the same price of \$20.73 per share, with the buy and sell transactions having the exact same dollar amount of \$3,501,297.00. It is, therefore, reasonable to infer that these two transactions in the claims data are the two sides of an inter-fund trade—an internal crossing trade within X Group of Funds.

C. Robustness Check—Are These Really Inter-Fund Trades?

To confirm that these inter-fund trades identified by our algorithm are indeed inter-fund trades, we obtain a separate dataset: proprietary transaction-level institutional trading data from Abel Noser Solutions, a leading execution quality measurement service provider for institutional investors. The Abel Noser data has been used by several academic studies on trading behaviors of institutional investors, for example, Hu, Meng, and Potter (2008), Hu (2009), Chemmanur, Hu, and Huang (2010), and Goldstein, Irvine, and Puckett (2011).

The Abel Noser data cover equity trading transactions by a large sample of institutions from January 1999 to December 2010. For each transaction, the data include the date of the transaction, the stock traded (identified by both symbols and CUSIPs), the number of shares traded, the dollar principal traded, commissions paid by the institution, and whether it is a buy or sell by the institution. The data are provided to us under the condition that the names of all institutions are removed from the data. However, identification codes are provided enabling us to separately identify all institutions. Sample institutions are either investment managers or plan sponsors. Investment managers are mutual fund families such as Fidelity Investments, Putnam Investments, and Lazard Asset Management. Examples of pension plan sponsors include the California Public Employees' Retirement System (CalPERS), the Commonwealth of Virginia, and United Airlines.

In the Abel Noser data, inter-fund trades are identified as trades conducted by an investment manager for the same number of shares on the opposite side (buy and sell) of the same stock, on the same day, executed at exactly the same price, with the same commissions per share but from different accounts/funds. Direct and brokered inter-fund trades can then be separated with commission information: direct inter-fund trades require zero commissions and the remainder are brokered inter-fund trades. Though most inter-fund trades are conducted directly within a fund family (thus incurring no commissions), to circumvent certain regulations, the fund family sometimes assigns an outside broker for certain inter-fund trades and pay pre-negotiated commissions per share on these trades. For more details, please see Conrad, Hu, and Wahal (2012).

Once we identify inter-fund trades in Abel Noser data, we can then compare them with the inter-fund trades for ABC Systems identified in the damage claims data earlier. Though the Abel Noser data are anonymous, we were able to identify a very large institutional investor, which is also present in the

damages claims data, enabling us to cross-check inter-fund trades separately identified in the two datasets. An example of inter-fund trades identified in the Abel Noser data is presented in Table 2.

Table 2
Example of Inter-Fund Trades Identified in Abel Noser Data

Trade Date	Perm. #	Side	Client Code	Price	Quantity	Commissions
20070208	99999	1	74	20.73	168900	0
20070208	99999	-1	74	20.73	168900	0

Clearly, the inter-fund trade in Table 2 (from Abel Noser data) is the same transaction as the apparent inter-fund trade in Table 1 (from damage claims data), based on information such as date, shares traded, and price per share, etc. In fact, for all the inter-fund trades identified in the damage claims data for the very large institutional investor, we are able to find their counterparts in Abel Noser data, and vice versa. The fact that we identified the same set of inter-fund trades from two independent data sources makes us confident about both our algorithm for identifying inter-fund trades and the accuracy of the data on inter-fund trades.

D. Inter-Fund Trades and Damages

During the approximately 11-month class period covered by the ABC Systems lawsuit, we identify 2,680 distinct inter-fund trades. While this may appear to be a relatively small number, it is a significant portion of the trades captured in the claims data. The claims data contained 47,216 purchase transactions over the course of the ABC Systems class period. The 2,680 identified inter-fund trades, therefore, account for 5.7% of the total number of purchase transactions.

The inter-fund trades are a more substantial component of the total purchase transactions when measured by dollar or share volume rather than number of transactions. This finding is unsurprising given that inter-fund transactions can only be undertaken by large institutional investors whose transactions will almost certainly be larger than individual investors. During the ABC Systems class period, the total dollar amount of the purchase transactions in the claims data was \$770.3 million. Of this, \$67.7 million, or 8.8% occurred via inter-fund trading. Similarly, of the 51.9 million shares purchased in the claims data, 4.6 million, or 8.8%, were the result of inter-fund transactions. Again, it is important to note that our algorithm for identifying inter-fund trades is conservative and may understate the extent of inter-fund trading.

After establishing that inter-fund trading accounted for a notable portion of the trading in the claims data for ABC Systems, we turn to the question of

whether inter-fund trading can explain some or all of the underestimation of damages and the number of damaged shares. We start by calculating the number of shares purchased daily during the class period according to the claims data. We then compare publicly reported daily market volume with the trading volume according to the claims data, on a daily basis, throughout the class period.

Table 3
Claimed Versus Publicly Reported Volume – The Puzzle

Date	Claimed Purchases	NASDAQ Reported Quantity	Difference
12/22/06	346,120	281,880	64,240
12/28/06	418,360	333,306	85,054
1/16/07	198,138	169,719	28,419
1/17/07	141,099	104,074	37,025
1/26/07	100,200	95,881	4,319
4/17/07	456,186	251,609	204,577

The comparison between publicly reported volumes and claims data volumes yields six “puzzling” trading days. On these puzzling days, shown in Table 3, claimed purchases exceeded the publicly reported market volume on the NASDAQ. In total, the claimed purchase volume on these six days exceeded the NASDAQ reported volume by 423,634 shares.

The fact that claimed purchases exceeded reported market volumes is puzzling for multiple reasons. Cox and Thomas (2002) find that many institutional investors do not file claims in securities fraud class actions. It stands to reason that individual investors file claims even less frequently, as their expected recoveries on a small number of shares are often *de minimis*. Consequently, one would expect the claimed purchases to be lower than reported market volume.

The perplexing nature of these puzzling data is compounded by the fact that market volumes are generally adjusted down to account for the impact of market maker participation in NASDAQ trading (or specialist participation on the NYSE). Historically, when trades occurred on the NASDAQ, a market maker would purchase shares from a seller and then sell those shares to a buyer, rather than the buyer and seller being matched without the intermediary. As a result, volume was overstated by up to 100%. Because the market makers simultaneously buy and sell, they would not suffer damages and their trading volume would need to be adjusted out of the reported market volumes.

Knowing that there was a meaningful amount of inter-fund trading during the ABC Systems class period, we examine the question of whether inter-fund trading was responsible for the differential between claimed purchases and reported market volumes. As shown in Tables 4 and Figure 1, inter-fund trading appears to be a large component of the discrepancy on three of the six puzzling days.

In total, inter-fund trading accounted for purchases of 248,365 shares of ABC Systems on the six puzzling days. This amounts to 58.6% of the total dis-

crepancy between the claimed purchases and the reported market volumes. The large variation of the fraction of discrepancy attributable to inter-fund trading (6% to 73%) suggests that there might be other factors contributing to the discrepancy. While inter-fund trading cannot account for the entire differential, and on some days it accounts for only a small amount of the differential, it is clearly an important component of the observed discrepancy, particularly on the three of the six puzzling days when the differences between claimed purchases and reported market volumes are the largest.

Table 4
Inter-Fund Trading Volume on Puzzling Days

Date	Claimed Purchases	NASDAQ Reported Quantity	Difference	InterFund Quantity	InterFund/Difference
12/22/06	346,120	281,880	64,240	38,794	60%
12/28/06	418,360	333,306	85,054	62,058	73%
1/16/07	198,138	169,719	28,419	1,600	6%
1/17/07	141,099	104,074	37,025	2,700	7%
1/26/07	100,200	95,881	4,319	500	12%
4/17/07	456,186	251,609	204,577	142,713	70%

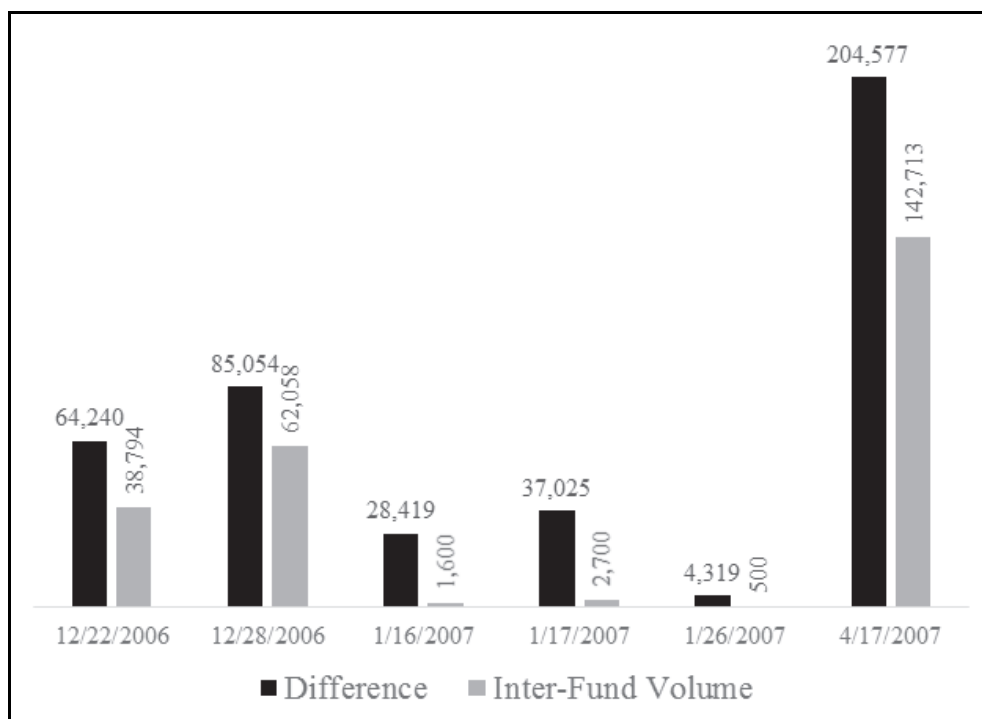


Figure 1. Puzzling Days

IV. Practical and Policy Implications

Practical Implications

While we only analyze claims data from one case, our findings have a number of practical implications, generally for any analysis of securities trading volumes, and more specifically for financial analysts performing estimates of damages in securities class action matters. Our findings also expose unexplored issues that may merit further research.

From a general perspective, our results clearly show that inter-fund trading exists, and can account for a meaningful component of total trading volumes. In the ABC Systems case, reported market volume over the class period was 106.6 million shares. Unreported inter-fund trading volume was 4.6 million shares, or 4.3% of the reported market volume. Any analysis of trading in ABC Systems during this period using publicly reported volume figures would not have been comprehensive, as it would not have accounted for this unreported trading.

While inter-fund trading equaled 4.3% of reported market volumes and 8.8% of claimed purchases over the course of the entire 11-month class period, inter-fund trading did not exhibit a consistent correlation with either reported or claimed volume. The correlation between daily reported market volume and inter-fund volume was 29.7%, and the correlation between daily inter-fund volume and claimed volume (of which it was a part) was 37.5%. This contrasts sharply with the 91.1% correlation between daily reported market volume and claimed volume. In terms of reported market volumes, daily inter-fund trading ranged from 0.0% to 60.0%, with a median of 1.8%.

Our findings also indicate that the market maker volume adjustment to reported market volumes on the NASDAQ may no longer be necessary. Given that reported volumes were below claimed purchases on certain days, even with the addition of inter-fund trading it appears as though reported volumes were too low on these days, and not artificially high because of market maker activities. This finding comports with Gao and Ritter (2010), who assert that starting in 2004 no adjustments should be made for NASDAQ or NYSE trading volumes (the ABC Systems class period was 2006-2007).

Our findings also have practical implications that are specific to damage analysis in securities fraud class action litigation. The basis for all damage estimates is the reported market volumes. Only shares that were purchased during the class period could have suffered damages. Consequently, many outstanding shares will not be damaged, as shares can be purchased before a class period and held throughout. Using reported volumes, the analyst can estimate when shares were purchased and re-traded during the class period, resulting in an estimate of the number of total outstanding shares that were damaged. However, reported market volumes are understated because they fail to incorporate inter-fund trading.

Similarly, the estimated number of damaged shares and the aggregate damages for a class will also be underestimated, because they are based on reported market volumes that understate the true number of shares that traded

during the class period. One potential solution to the problem is to make an adjustment to increase the publicly reported volume data, based on empirical analysis of inter-fund trades, in a manner similar to the volume reduction adjustment advocated by Gould and Kleidon (1994) to account for market maker trades, which has become widely used and generally accepted practice.

B. Policy Implications

Our findings also have policy implications for financial regulators. Currently, there is no requirement for inter-fund trading activities to be publicly reported. This contrasts starkly with trading in dark pools. Dark pools contain trades that are not openly available to the public, and these trades are conducted by financial institutions away from public exchanges so that the trades are anonymous.

While conducted anonymously and out of the public eye of the major exchanges, even trading that occurs in dark pools is still publicly reported and ultimately captured in the consolidated trading data.

Public reporting of inter-fund trading will serve two important purposes. Public reporting of inter-fund trading will enhance the accuracy and transparency of market data, as it will present to market participants the complete record of trading that took place in a particular security. It will give a clearer picture of the depth of the market for any given security,⁹ and enable more comprehensive trading analyses.

Public reporting of inter-fund trading will also help ensure that inter-fund trading does not lead to abuses of the ability to trade outside the public markets. Improper inter-fund trading could benefit investors of one fund at the expense of the investors of another. Since funds within the same fund family have fiduciary duties to their own respective investors, inter-fund trades should only happen if such trades are beneficial to investors of both funds involved, or alternatively, beneficial to one fund and at least neutral (not harmful) to the other fund. By publicly reporting inter-fund trades, investor watchdogs could confirm that inter-fund trades were being executed properly and fairly.

Another policy implication has to do with how one can improve the process claims data are collected and used in securities class action litigations. Our findings call for collecting the transactions and claimed damages of the proposed class early in the case in order to obtain an estimate of alleged damages that is not distorted by inaccuracies in publicly reported trading volume, nor by simplifying assumptions of volume-based trading models that may not capture actual trading patterns. Advances in technology and trade reporting systems over time may be able to reduce the cost of using claims data sufficiently to encourage attorneys and experts to abandon further tweaking of volume-based trading models.

⁹This is limited by the extent to which inter-fund trading within the same family reflects taking money out of one pocket and putting it into the other, perhaps in order to transfer performance across member funds to favor those funds with a higher expected contribution to family profits.

V. Conclusion

We evaluate the case of damage underestimation in the ABC Systems securities class action matter. In this case, both the total claimed damages and the claimed number of damaged shares exceeded estimates, a puzzling occurrence considering that many class members generally fail to file claims. We find that on six days during the 11-month class period, claimed purchases exceeded reported market volumes. We find that inter-fund trading, which accounted for nearly 9% of total claimed purchases during the class period, helps explain the discrepancy between reported and claimed volumes.

While we acknowledge that this study is limited in scope, our findings illustrate the potential problems that unreported inter-fund trading present. Our findings suggest that inter-fund trading can be a meaningful component of total trading volume and causes all estimates of aggregate damages to be understated.

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