Trading by Crossing

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What Do We Study?

- We study the use of **internal crosses** in trading by institutional investors (e.g., Fidelity Investments).
  - Conrad, Johnson, and Wahal (2003) study trades executed on external crossing systems such as ITG's POSIT, and after-hours crossing on the NYSE and Instinet.
- Internal crosses are a way for institutions to execute some naturally-occurring opposite side transactions without exposing them to the market.
- Institutional trading is costly.
  - Trades move prices, incurring market impact or implicit trading costs, and execution incurs commissions and other explicit costs.
- Internal crosses, therefore, represent an important way in which institutions can minimize trading costs.

Darker Than All "Dark Pools"

- "Dark pool" trades are reported in CRSP and TAQ (post-trade reporting, "dark" in terms of liquidity availability).

- Internal crosses are NOT reported to exchanges, and therefore are not included in publicly reported daily trading volume.
  - NOT in CRSP or TAQ

- Dark Pool Trades: dark pre-trade but "lit" post-trade
- Internal Crosses: dark both pre- and post-trade

- These internal crossing trades represent the only case where actual executed trades are not publicly reported anywhere.

- A case study of the consequences:
  - Feinstein, Hu, Marcus, and Ali ("*JFE*" 2013).

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

Steven Feinstein, Gang Hu, Mark Marcus, and Zann Ali*

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.

Regulatory Inconsistency

- The SEC **allows** such cross trading within mutual fund families through exemptions provided under *rule 17a-7* under the *Investment Company Act of 1940*.

- 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.*"

Regulatory Inconsistency

- Pension plan sponsors fall under the purview DOL (Department of Labor), are **prohibited** from doing so.
  - DOL believes that crosses can be used to favor one account over another using a variety of mechanisms such as cherry-picking which securities to cross, or selectively choosing the timing of the cross, etc., which is a violation of section 406(b)(2) of ERISA.
- However, recognizing that such a blanket prohibition may impose costs on plan sponsors, the DOL grants individual exemptions from prohibitions of this section of ERISA.
  - These exemptions, referred to as Prohibited Transaction Exemptions (PTEs), are granted to the investment manager for specific plan sponsors' accounts that are subject to ERISA regulations.

Scant Literature Inconsistent with Regulations and Practices

- Indirect evidence: Gaspar, Massa, and Matos (2006)
  - Strategic cross-fund subsidization: based on observed fund returns, allocations of underpriced initial public offerings, and finally opposite trades across member funds **inferred** from quarterly changes in holdings reported by mutual funds.
  - **Inconsistency between current literature versus regulations and practices**.

- Direct (but NOT comprehensive) evidence: Using both claims data in class action securities cases and a subset of Abel Noser data, Feinstein, Hu, Marcus, and Ali (2013) find that aggregate damages in class action securities cases estimated using public volume data may be understated due to the frequent occurrence of inter-fund trades (or internal crosses).

- Working paper: Eisele, Nefedova, Parise, and Peijnenburg (2017) use a random sample of one million or 1% of Abel Noser equity transactions.

Summary

- We employ proprietary institutional trading data (Abel Noser / ANcerno data) containing trades worth over $33 trillion over a 12-year period.

- We apply an algorithm that isolates internal crosses from market trades and examine the **extent** of internal crosses.
  - We identify half a million internal crossing trade orders worth over **$1 trillion**.
  - 1.6% of the total number of orders executed and **3.1%** of total trade value.

Summary

- **Benefits**: estimate cost savings by comparing internal crosses to benchmark trades ("what if" analysis):
  - **Cost savings**: about **$1.9 billion** over the sample period for sample institutions.

- **Determinants** of the usage of internal crosses:
  - A **larger investment manager** with more assets under management is more likely to have funds that seek to take opposite positions in a security across their respective portfolios, generating more opportunities to cross trades internally.
  - Similarly, an investment manager that **trades more** (either because of flow volatility or portfolio turnover), is likely to have more opportunities to cross trades internally.

Diseconomies of Scale in Asset Management

- Berk and Green (2004) assume decreasing returns to scale
- Supported by:
  - Chen, Hong, Huang, and Kubik (2004)
  - Yan (2008)
  - Anand, Irvine, Puckett, and Venkataraman (2012)
  - Pastor, Stambaugh, and Taylor (2014, 2015)
- But dis-economies-of-scale is at individual fund level (controlling for fund family size).
- Is there any economies-of-scale at fund-family level?

Potential Economies of Scale in Asset Management

- 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).

Potential Economies of Scale in Asset Management

- Hence, there are many potential opportunities for funds within the same family to cross trade with each other.

- We provide fresh evidence of a potential source of economies-of-scale in asset management (at Fund-Family Level).
  - Namely, the larger the investment manager, the higher the chance of internal crosses, leading to trading cost savings.

- 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."

Summary

- **Potential crosses**:
  - Transactions that investment managers conduct in public markets, which barring regulatory hurdles (and perhaps timing issues) could have been conducted via an internal cross.
  - We detect over 4 million potential crosses. Of the roughly $5 trillion in potentially crossable trades, about $1.1 trillion are **realizable**.
  - Potential cost savings **$2.4 billion**.
  - Upper bound of **potential benefits**, since it does not include a consideration of costs which may have precluded the internal cross.

- **Effects of internal crosses on external market liquidity**
  - Observed versus implied Amihud (2002) illiquidity measure.

Contribution

- Internal crosses are not publicly reported anywhere, and represent one of the "*unobserved actions of mutual funds*" analyzed in Kacperczyk, Sialm, and Zheng (2008).
- Using actual institutional trades and internal crosses, we provide comprehensive and direct evidences on the extent, cost savings, determinants, and effects of internal crosses.
- **First evidence on significant cost savings of internal crosses**.

Contribution

- Relative to **current mutual fund literature**: our findings highlight an **unusual channel of economies of scale** in investment management, in contrast to the typical diseconomies of scale.

- Relative to **literature on internal crosses**: complement the findings in Gaspar, Massa, and Matos (2006), who study indirectly inferred opposite trades based on quarterly fund holding changes and focus on the "dark side" of using internal crosses for strategic cross-fund subsidization. On the other hand, our findings provide sound positive economic reasons for why fund families conduct internal crosses, thus justify their existence.

Policy Implications

- Prior literature only focuses on the potential dark side of internal crosses
  - **Why regulators, the SEC and the DOL, do not forbid cross trading altogether?**
  - Regulatory inconsistencies between the SEC, which allows internal crosses within mutual fund families, and the DOL, which forbids such trading for plan sponsors but grants individual exemptions on a case-by-case basis.
- Our paper provides the first evidence on significant cost savings of internal crosses, and thus offer justifications for the SEC to continue to allow such trading within mutual fund families, and add support to the debate at the DOL on whether to loosen the prohibition of cross trading for plan sponsors.

Policy Implications

- Public disclosure and reporting of internal crosses post-trade:
  - Enhance the accuracy and integrity of market data.
  - Public reporting of internal crosses will also help ensure that they do not lead to abuses of the ability to trade outside the public markets, as pointed out by Gaspar, Massa, and Matos (2006).

Abel Noser (ANcerno) Data

- Transaction-level institutional trading data from a leading execution quality measurement service provider to institutional investors
  - Abel Noser Solutions (also known as Abel Noser, or ANcerno).

- For each transaction, the data include:
  - Date of the transaction
  - Stock traded
  - Whether it is a buy or sell by the institution
  - Number of shares traded
  - Execution price of the shares traded
  - Commissions paid by the institution
  - Type of Institution: *Investment Managers* (e.g., Fidelity) or *Plan Sponsors* (e.g., CalPERS)

Abel Noser (ANcerno) Data

- The data include transactions from January 1999 to December 2010 (12 years)
  - Abel Noser provides the data on an on-going basis, but big change in 2011 (stopped providing some key variables).

- Abel Noser Data Page: **http://ganghu.org/an**

- Abel Noser "Data Paper":
  - Hu, Jo, Wang, and Xie (2018)
  - http://ssrn.com/abstract=3090150

Identify Internal Crosses

- We identify internal crosses as pairs of trades conducted within the same fund family:
  - same number of shares
  - on the opposite side (buy and sell)
  - same stock
  - same trading day
  - executed at exactly the same price
  - but from different funds/accounts
  - with zero commissions

- Ad hoc check with authentic data.

Table 1 Data Descriptive Statistics

Panel A: Number of orders and trade value covered in dataset

	Number of orders (in million)			Trade value (in billion dollar)		
	Buy	Sell	Total	Buy	Sell	Total
1999	0.484	0.324	0.808	832.79	800.99	1,633.78
2000	0.609	0.433	1.043	1,107.40	1,082.10	2,189.50
2001	0.755	0.531	1.286	1,101.37	1,028.32	2,129.69
2002	1.009	0.786	1.795	1,143.07	1,117.01	2,260.08
2003	1.191	0.879	2.071	1,061.35	1,065.91	2,127.25
2004	1.417	1.126	2.542	1,245.43	1,201.85	2,447.28
2005	1.534	1.321	2.856	1,457.40	1,476.41	2,933.82
2006	1.912	1.775	3.687	1,846.41	1,865.72	3,712.13
2007	1.921	1.753	3.674	1,930.03	1,977.78	3,907.81
2008	1.998	2.017	4.015	1,907.23	1,931.70	3,838.92
2009	1.961	1.931	3.892	1,380.12	1,396.50	2,776.61
2010	1.841	1.939	3.781	1,263.75	1,283.42	2,547.17
All years	16.633	14.816	31.449	16,276.36	16,227.71	32,504.06

Panel B: Number of mutual fund families and stocks classified by types of trade

	Number of mutual fund families			Number of stocks		
	All trades	Market trades	Internal crosses	All trades	Market trades	Internal crosses
1999	37	37	8	6,148	6,148	1,272
2000	43	43	11	6,070	6,070	1,283
2001	63	63	20	5,687	5,685	1,297
2002	80	80	26	5,388	5,388	1,485
2003	85	85	21	5,490	5,490	1,324
2004	116	116	26	6,183	6,182	1,550
2005	133	133	30	6,253	6,253	3,288
2006	157	157	37	6,445	6,445	3,132
2007	157	157	38	6,556	6,556	2,505
2008	151	151	41	5,968	5,967	2,923
2009	145	145	41	5,301	5,301	2,788
2010	140	140	33	5,440	5,440	3,147
All years	388	388	145	11,891	11,891	5,565

Panel C: Number of orders and trade value classified by types of trades

	No of orders (in million)		Trade value (in billion dollar)	
	Market trades	**Internal crosses**	**Market trades**	**Internal crosses**
1999	0.789	0.018	1,564.13	69.65
	(97.73%)	(2.27%)	(95.74%)	(4.26%)
2000	1.017	0.026	2,046.35	143.15
	(97.55%)	(2.45%)	(93.46%)	(6.54%)
2001	1.260	0.026	2,014.27	115.43
	(97.98%)	(2.02%)	(94.58%)	(5.42%)
2002	1.773	0.022	2,172.12	87.96
	(98.76%)	(1.24%)	(96.11%)	(3.89%)
2003	2.053	0.018	2,081.41	45.84
	(99.13%)	(0.87%)	(97.85%)	(2.15%)
2004	2.525	0.017	2,404.86	42.42
	(99.34%)	(0.66%)	(98.27%)	(1.73%)
2005	2.795	0.061	2,820.01	113.81
	(97.86%)	(2.14%)	(96.12%)	(3.88%)
2006	3.615	0.072	3,597.91	114.22
	(98.04%)	(1.96%)	(96.92%)	(3.08%)
2007	3.616	0.057	3,816.56	91.26
	(98.44%)	(1.56%)	(97.66%)	(2.34%)
2008	3.952	0.063	3,739.78	99.15
	(98.43%)	(1.57%)	(97.42%)	(2.58%)
2009	3.832	0.060	2,715.29	61.32
	(98.46%)	(1.54%)	(97.79%)	(2.21%)
2010	3.735	0.046	2,512.31	34.86
	(98.78%)	(1.22%)	(98.63%)	(1.37%)
All years	**30.962**	**0.487**	**31,484.99**	**1,019.07**
	(98.45%)	**(1.55%)**	**(96.86%)**	**(3.14%)**

Table 2 Order and Security Characteristics

Panel A: Internal crosses

	Large stocks			Small stocks			All stocks		
	1999 – 2004	2005 – 2010	1999 – 2010	1999 – 2004	2005 – 2010	1999 – 2010	1999 – 2004	2005 – 2010	1999 – 2010
Number of buys (in million)	0.06	0.13	0.18	0.01	0.05	0.06	0.06	0.18	0.24
Total buy value (in billion dollar)	244.25	229.83	474.08	7.97	27.48	35.45	252.22	257.31	509.53
Number of sells (in million)	0.06	0.13	0.18	0.01	0.05	0.06	0.06	0.18	0.24
Total sell value (in billion dollar)	244.25	229.83	474.08	7.97	27.48	35.45	252.22	257.31	509.53
Average trade value (in million dollar)	4.37	1.82	2.60	1.03	0.52	0.58	3.97	1.43	2.09
Average trade size (in thousand share)	118.75	54.66	74.29	78.07	33.42	39.08	113.80	48.36	65.46
Average relative trade size (%)	7.78	1.66	3.54	60.97	8.97	15.56	14.25	3.83	6.55
Average daily return standard deviation (day -20 to -1, in %)	3.39	2.30	2.64	3.91	3.11	3.21	3.46	2.54	2.78
Average daily turnover (day -20 to -1, in basis point)	0.88	1.28	1.16	1.18	1.41	1.38	0.91	1.32	1.21
Stock return on trading day (%)	-0.11	0.05	0.00	-0.44	0.08	0.02	-0.15	0.06	0.01
Cumulative stock return (day -20 to -1, in %)	1.18	1.07	1.10	-0.54	1.55	1.29	0.97	1.21	1.15

Panel B: Market trades

	Large stocks			Small stocks			All stocks		
	1999 – 2004	2005 – 2010	1999 – 2010	1999 – 2004	2005 – 2010	1999 – 2010	1999 – 2004	2005 – 2010	1999 – 2010
Number of buys (in million)	3.68	6.62	10.31	1.72	4.36	6.08	5.40	10.99	16.39
Total buy value (in billion dollar)	5,729.64	8,216.57	13,946.21	509.55	1,311.07	1,820.62	6,239.19	9,527.64	15,766.82
Number of sells (in million)	2.85	6.92	9.77	1.16	3.64	4.80	4.02	10.56	14.57
Total sell value (in billion dollar)	5,603.56	8,457.48	14,061.04	440.40	1,216.74	1,657.14	6,043.96	9,674.22	15,718.17
Average trade value (in million dollar)	1.73	1.23	1.40	0.33	0.32	0.32	1.30	0.89	1.02
Average trade size (in thousand share)	51.57	39.96	41.72	22.76	19.13	20.09	42.75	30.34	34.11
Average relative trade size (%)	3.83	1.34	2.15	19.75	6.68	10.14	8.70	3.32	4.96
Average daily return standard deviation (day -20 to -1, in %)	2.49	2.23	2.31	3.28	3.08	3.14	2.73	2.55	2.60
Average daily turnover (day -20 to -1, in basis point)	0.77	1.31	1.13	0.86	1.34	1.21	0.80	1.32	1.16
Stock return on trading day (%)	0.07	0.07	0.07	0.07	0.03	0.04	0.07	0.06	0.06
Cumulative stock return (day -20 to -1, in %)	1.62	1.09	1.26	1.38	0.32	0.60	1.55	0.81	1.03

Table 3 Trading Cost Statistics

Panel A: All trading days

		Buys				Sells			
		No of orders	Implicit costs	Explicit costs	Total costs	No of orders	Implicit costs	Explicit costs	Total costs
Large stocks	Internal crosses	182,273	-20.24	0.00	-20.24	182,273	20.24	0.00	20.24
	Market trades	10,305,425	19.97	9.12	29.08	9,770,236	31.57	9.20	40.77
	Difference		-40.21***	-9.12***	-49.33***		-11.33***	-9.20***	-20.52***
Small stocks	Internal crosses	60,977	-40.12	0.00	-40.12	60,977	40.12	0.00	40.12
	Market trades	6,084,034	18.28	16.59	34.87	4,802,357	41.62	17.43	59.05
	Difference		-58.40***	-16.59***	-74.98***		-1.51	-17.43***	-18.94***
All stocks	Internal crosses	243,250	-21.63	0.00	-21.63	243,250	21.63	0.00	21.63
	Market trades	16,389,459	19.77	9.98	29.75	14,572,593	32.63	10.06	42.70
	Difference		-41.40***	-9.98***	-51.38***		-11.01***	-10.06***	-21.07***

Panel B: On days with positive open-to-close return

		Buys				Sells			
		No of orders	Implicit costs	Explicit costs	Total costs	No of orders	Implicit costs	Explicit costs	Total costs
Large stocks	Internal crosses	89,619	116.00	0.00	116.00	89,619	-116.00	0.00	-116.00
	Market trades	5,194,913	136.29	9.17	145.46	4,775,558	-107.61	9.22	-98.39
	Difference		-20.29***	-9.17***	-29.46***		-8.39***	-9.22***	-17.61***
Small stocks	Internal crosses	30,340	130.41	0.00	130.41	30,340	-130.41	0.00	-130.41
	Market trades	3,043,893	178.50	16.82	195.32	2,214,410	-150.81	17.24	-133.57
	Difference		-48.10***	-16.82***	-64.92***		20.40***	-17.24***	3.16**
All stocks	Internal crosses	119,959	116.96	0.00	116.96	119,959	-116.96	0.00	-116.96
	Market trades	8,238,806	141.07	10.04	151.10	6,989,968	-112.25	10.08	-102.17
	Difference		-24.10***	-10.04***	-34.14***		-4.71***	-10.08***	-14.79***

Panel C: On days with negative open-to-close return

		Buys				Sells			
		No of orders	Implicit costs	Explicit costs	Total costs	No of orders	Implicit costs	Explicit costs	Total costs
Large stocks	Internal crosses	90,593	-149.53	0.00	-149.53	90,593	149.53	0.00	149.53
	Market trades	4,981,160	-122.29	8.98	-113.31	4,878,085	141.57	9.11	150.68
	Difference		-27.24***	-8.98***	-36.22***		7.96***	-9.11***	-1.15
Small stocks	Internal crosses	29,493	-190.49	0.00	-190.49	29,493	190.49	0.00	190.49
	Market trades	2,902,326	-169.91	16.11	-153.81	2,481,798	201.37	17.38	218.75
	Difference		-20.57***	-16.11***	-36.68***		-10.89***	-17.38***	-28.26***
All stocks	Internal crosses	120,086	-152.47	0.00	-152.47	120,086	152.47	0.00	152.47
	Market trades	7,883,486	-127.87	9.82	-118.06	7,359,883	147.72	9.96	157.68
	Difference		-24.59***	-9.82***	-34.41***		4.75***	-9.96***	-5.21***

Panel D: On days with zero open-to-close return

		Buys				Sells			
		No of orders	Implicit costs	Explicit costs	Total costs	No of orders	Implicit costs	Explicit costs	Total costs
Large stocks	Internal crosses	2,061	-15.28	0.00	-15.28	2,061	15.28	0.00	15.28
	Market trades	129,352	-2.40	12.27	9.87	116,593	0.33	12.19	12.51
	Difference		-12.88***	-12.27***	-25.15***		14.95***	-12.19***	2.77
Small stocks	Internal crosses	1,144	-14.23	0.00	-14.23	1,144	14.23	0.00	14.23
	Market trades	137,815	-4.38	22.46	18.08	106,149	6.52	24.15	30.67
	Difference		-9.85***	-22.46***	-32.31***		7.70**	-24.15***	-16.45***
All stocks	Internal crosses	3,205	-15.19	0.00	-15.19	3,205	15.19	0.00	15.19
	Market trades	267,167	-2.71	13.88	11.16	222,742	1.26	13.99	15.25
	Difference		-12.48***	-13.88***	-26.35***		13.93***	-13.99***	0.06

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Table 4 Trading Cost Regressions

	Implicit costs				Total costs			
	Buys		Sells		Buys		Sells	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Internal cross	**-11.571*****	**-10.893*****	**-3.893****	**-3.802****	**-20.789*****	**-18.769*****	**-13.197*****	**-12.565*****
	(-6.35)	**(-5.91)**	**(-2.20)**	**(-2.28)**	**(-10.47)**	**(-9.43)**	**(-7.72)**	**(-7.70)**
Positive open-to-close return	139.288***	140.139***	-123.041***	-123.017***	138.848***	139.657***	-123.963***	-123.986***
	(33.65)	(33.71)	(-32.11)	(-32.13)	(33.60)	(33.62)	(-32.09)	(-32.17)
Negative open-to-close return	-128.622***	-128.564***	130.992***	131.948***	-129.200***	-129.200***	130.136***	131.042***
	(-31.82)	(-31.75)	(30.88)	(30.83)	(-31.90)	(-31.87)	(30.97)	(30.88)
Log (market capitalization)	0.441**	0.478***	0.805***	0.975***	0.481***	0.684***	0.553***	0.878***
	(2.49)	(2.67)	(5.22)	(6.22)	(2.71)	(3.71)	(3.66)	(5.83)
Log (relative trade size)	1.094***	0.711***	2.841***	2.265***	1.998***	1.620***	3.390***	2.630***
	(9.20)	(6.23)	(21.72)	(18.71)	(16.39)	(13.92)	(25.82)	(21.26)
Inverse price	33.564***	25.846***	67.941***	60.623***	170.762***	164.301***	241.173***	236.637***
	(4.37)	(3.42)	(8.34)	(7.65)	(17.70)	(17.49)	(24.14)	(25.41)
NYSE/AMEX	-3.879***	-4.216***	-1.490	-1.605*	-1.171	-1.526*	2.111**	2.289***
	(-5.37)	(-5.70)	(-1.52)	(-1.66)	(-1.46)	(-1.84)	(2.54)	(2.70)
Return standard deviation	-0.131	0.108	2.452***	2.624***	0.279	0.552	2.896***	3.040***
(day -20 to -1)	(-0.35)	(0.29)	(6.35)	(6.76)	(0.75)	(1.46)	(7.34)	(7.66)
Cumulative stock return	-0.060*	-0.017	-0.185***	-0.219***	-0.071**	-0.032	-0.198***	-0.234***
(day -20 to -1)	(-1.67)	(-0.49)	(-4.99)	(-5.82)	(-2.00)	(-0.89)	(-5.35)	(-6.16)
Average turnover	1.033***	1.142***	0.922***	1.027***	1.171***	1.334***	0.976***	1.063***
(day -20 to -1)	(3.22)	(3.54)	(3.56)	(3.92)	(3.64)	(4.12)	(3.76)	(4.06)
Turnover standard deviation	-2.160***	-2.253***	0.391	0.277	-2.220***	-2.331***	0.277	0.182
(day -20 to -1)	(-5.35)	(-5.54)	(1.05)	(0.74)	(-5.47)	(-5.71)	(0.73)	(0.48)
Log (trading value of institution		1.112***		1.473***		0.974**		0.475
during calendar month)		(3.04)		(3.91)		(2.54)		(1.11)
Log (number of stocks traded by		1.580		2.927***		1.093		1.445
institution during calendar month)		(1.54)		(2.99)		(1.11)		(1.63)
Log (number of orders of		-1.351		-3.818***		-3.558***		-3.863***
institution during calendar month)		(-1.55)		(-4.09)		(-4.26)		(-4.26)
Institution fixed effect	Yes	No	Yes	No	Yes	No	Yes	No
Average R^2	0.348	0.344	0.326	0.321	0.351	0.346	0.331	0.325

Figure 1
Magnitudes of the Yearly Averages (× -1) of the Internal Cross Dummy Variable in the Total Trading Costs Regressions with Institution Fixed Effect

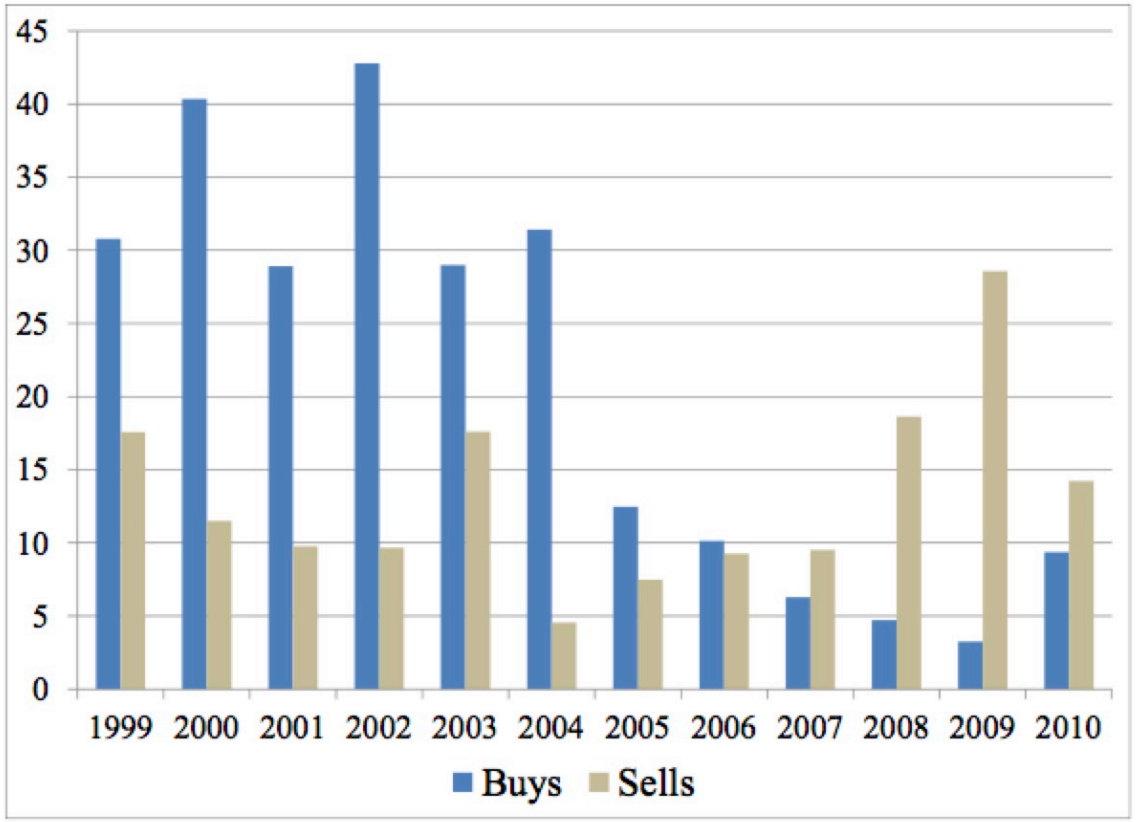

Table 5 Matched Sample Trading Cost Differentials

	Buy			Sell		
	Implicit costs	Explicit costs	Total costs	Implicit costs	Explicit costs	Total costs
1999	-20.38***	-6.43***	-26.81***	8.78***	-6.72***	2.05
	(2.53)	(0.07)	(2.53)	(2.38)	(0.07)	(2.39)
2000	-31.73***	-5.49***	-37.21***	4.12	-5.58***	-1.45
	(2.84)	(0.06)	(2.84)	(2.92)	(0.06)	(2.92)
2001	-20.13***	-8.90***	-29.04***	2.59	-8.76***	-6.17**
	(2.95)	(0.10)	(2.95)	(2.99)	(0.09)	(2.99)
2002	-24.53***	-16.36***	-40.89***	14.92***	-16.48***	-1.56
	(2.36)	(0.16)	(2.36)	(2.44)	(0.16)	(2.45)
2003	-20.36***	-16.70***	-37.06***	3.02	-16.83***	-13.81***
	(2.01)	(0.16)	(2.02)	(1.92)	(0.16)	(1.92)
2004	-28.57***	-14.11***	-42.68***	18.96***	-14.58***	4.38**
	(1.94)	(0.13)	(1.95)	(1.95)	(0.15)	(1.94)
2005	-9.40***	-10.18***	-19.58***	-5.95***	-10.35***	-16.29***
	(0.71)	(0.05)	(0.72)	(0.69)	(0.05)	(0.69)
2006	-15.75***	-7.32***	-23.07***	-1.42**	-7.37***	-8.79***
	(0.72)	(0.03)	(0.72)	(0.71)	(0.04)	(0.71)
2007	-13.19***	-6.49***	-19.68***	-0.96	-6.69***	-7.66***
	(0.91)	(0.04)	(0.91)	(0.91)	(0.04)	(0.91)
2008	-27.99***	-7.21***	-35.20***	-9.66***	-7.47***	-17.13***
	(1.79)	(0.04)	(1.79)	(1.72)	(0.04)	(1.72)
2009	-20.13***	-9.53***	-29.65***	-7.95***	-9.90***	-17.84***
	(1.32)	(0.05)	(1.32)	(1.32)	(0.06)	(1.32)
2010	-7.23***	-8.47***	-15.69***	-17.54***	-8.59***	-26.13***
	(1.15)	(0.05)	(1.15)	(1.18)	(0.06)	(1.18)
All years	-20.44***	-9.06***	-29.50***	0.53	-9.21***	-8.68***
	(0.49)	(0.02)	(0.49)	(0.48)	(0.02)	(0.48)

Table 6 Determinants of Internal Crosses

	Model 1	Model 2	Model 3
Intercept	-1.086***	-2.840***	-2.942***
	(-16.86)	(-16.00)	(-9.89)
Variables from Abel Noser			
Log (trading value of institution)	**0.165***		**0.189***
	(12.23)		**(3.95)**
Log (number of stocks traded by institution)	-0.131***		-0.354***
	(-4.65)		(-6.36)
Log (number of orders of institution)	**0.122***		**0.267***
	(4.23)		**(3.46)**
Variables from 13F			
Log (total value of portfolio assets of institution)		**0.388***	**0.170***
		(12.87)	**(4.21)**
Log (number of stocks held by institution)		-0.039	0.063
		(-0.90)	(0.88)
Portfolio concentration of institution		-0.098	-0.038
		(-0.47)	(-0.15)
Churn rate of institution		0.303***	0.114
		(2.83)	(0.69)
Number of quarterly observations	47	48	47
Average R^2	0.111	0.199	0.257

Table 7 Potential Crosses

Panel A: Descriptive statistics of potential crosses

	Buys	Sells
Number of orders (in million)	4.083	4.083
Total trade value (in billion dollar)	5,171.36	5,472.74
Total number of shares (in billion)	155.34	159.07

Panel B: Trading costs of potentially crossable and non-crossable market trades

	Buys		Sells	
	Crossable	Non-crossable	Crossable	Non-crossable
Implicit cost (in basis point)	13.67	22.75	33.72	32.05
	(0.12)	(0.07)	(0.12)	(0.07)
Explicit cost (in basis point)	8.18	10.86	8.33	10.99
	(0.00)	(0.00)	(0.00)	(0.00)
Total cost (in basis point)	21.85	33.61	42.05	43.04
	(0.12)	(0.07)	(0.12)	(0.07)

Panel C: Realizable and non-realizable fraction of potential crosses

	Realizable fraction		Non-realizable fraction	
	Buys	Sells	Buys	Sells
Total trade value (in billion dollar)	1,112.76	1,111.91	4,058.60	4,360.83
Total number of shares (in billion)	32.732	32.732	122.61	126.34
Actual explicit cost (in billion dollar)	0.780	0.800	3.446	3.780

Panel D: Realizable potential crosses from mutual fund families which have and have not conducted internal crossing

	From mutual fund families which have conducted at least one internally crossed trade		From mutual fund families which have never conducted internally crossed trades	
	Buys	Sells	Buys	Sells
Total trade value (in billion dollar)	1,084.12	1,083.26	28.646	28.649
Total number of shares (in billion)	31.919	31.919	0.814	0.814
Actual explicit cost (in billion dollar)	0.760	0.781	0.020	0.020

Table 8 Internal Crosses and External Market Liquidity

		N	Observed Amihud illiquidity measure	Implied Amihud illiquidity measure	Percentage difference
1999	Large stocks	8,368	0.016	0.013	13.28
	Small stocks	790	2.321	1.483	36.08
	All stocks	9,158	0.018	0.015	16.61
2000	Large stocks	11,973	0.014	0.012	15.06
	Small stocks	727	2.502	1.079	56.89
	All stocks	12,700	0.016	0.013	19.79
2001	Large stocks	11,616	0.013	0.012	13.64
	Small stocks	1,358	1.825	0.814	55.40
	All stocks	12,974	0.017	0.013	22.72
2002	Large stocks	9,257	0.013	0.011	10.11
	Small stocks	1,814	2.651	1.009	61.94
	All stocks	11,071	0.023	0.015	33.08
2003	Large stocks	7,691	0.009	0.009	7.63
	Small stocks	1,251	0.730	0.450	38.40
	All stocks	8,942	0.012	0.010	14.32
2004	Large stocks	6,570	0.006	0.005	7.25
	Small stocks	1,786	0.304	0.232	23.77
	All stocks	8,356	0.008	0.007	11.30

Table 8 Internal Crosses and External Market Liquidity (Cont'd)

2005	Large stocks	21,858	0.006	0.006	3.75
	Small stocks	7,820	0.404	0.335	17.19
	All stocks	29,678	0.010	0.010	9.12
2006	Large stocks	25,176	0.005	0.005	3.51
	Small stocks	9,819	0.233	0.196	15.84
	All stocks	34,995	0.008	0.008	7.94
2007	Large stocks	21,772	0.004	0.004	2.69
	Small stocks	6,103	0.154	0.111	27.75
	All stocks	27,875	0.005	0.005	9.74
2008	Large stocks	19,426	0.007	0.007	2.43
	Small stocks	11,105	0.375	0.342	8.77
	All stocks	30,531	0.013	0.012	5.39
2009	Large stocks	20,619	0.008	0.008	2.00
	Small stocks	8,282	0.744	0.677	9.05
	All stocks	28,901	0.016	0.015	5.59
2010	Large stocks	13,199	0.005	0.005	2.05
	Small stocks	9,416	0.407	0.360	11.47
	All stocks	22,615	0.015	0.014	8.04
All years	Large stocks	177,525	0.008	0.007	8.00
	Small stocks	60,271	0.460	0.347	24.62
	All stocks	237,796	0.012	0.011	13.76

Conclusion

- It is a common practice for mutual fund families to buy and sell the same stock for different funds or accounts on the same day.
- While many of these trades are executed through the external market, there is also a considerable amount executed by crossing internally within the fund family.
- Internally crossed trades incur lower implicit costs and explicit costs of trading.

Conclusion

- The total trading cost savings enjoyed by our sample mutual fund families amount to $1.9 billion.
- If mutual fund families are able to exploit profitable opportunities by executing those potentially crossable market trades through an internal crossing mechanism, there can be a further saving of $2.4 billion.
- Since larger mutual fund families are more likely to trade by internal crosses, our findings identify a new channel and explanation for the **sources of economies-of-scale** in asset management.

Conclusion

- Our findings **complement** prior findings of diseconomies of scale in investment management and the dark side of using internal crosses for strategic cross-fund subsidization.

- Our study focuses on the **positive benefits** of internal crosses and has important policy and regulatory implications for both the **SEC** and **DOL**.