



Wharton
UNIVERSITY *of* PENNSYLVANIA

**JACOBS LEVY EQUITY
MANAGEMENT CENTER**
FOR QUANTITATIVE FINANCIAL RESEARCH

**Are Some Clients More Equal Than Others?
Evidence of Price Allocation by Delegated Portfolio Managers
(with Ryan D. Israelsen)**

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MOTIVATION

Management companies have diversified sets of clients:

Defined Benefit and Defined Contribution plans, endowments, insurance companies, mutual funds, and high-net-worth individuals

Investment decisions that maximize the value of the management company **as a whole** *may differ* from those that maximize the values of **individual clients**

Do management companies *display favoritism* toward some of their clients (or products) at the expense of others?

MOTIVATION (CONT'D)

Which products may be more important?

- “Star products” – high profile products – positive spillover effect (e.g., Massa (2003), and Nanda, Wang, and Zheng (2004))
- Young products – more sensitive to early performance (e.g., Chevalier and Ellison (1997))
- Products / clients with different attention – households vs. institutional investors
- Client power - direct (size) or indirect (connections)

Possible Benefits?

- Increase in AUM (e.g. “flow convexity” – Brown, Harlow and Starks (1996), Chevalier and Ellison (1997), Sirri and Tufano (1998))
- Reputation (e.g., Khorana and Servaes (1999))

LITERATURE REVIEW

Gaspar, Massa and Matos (2006) - *mutual fund families* - evidence of strategic performance allocation toward “high family value” funds such as *star funds*, *high fee funds* and *young funds*

Chaudhuri, Ivkovic and Trzcinka (2013) - *institutional money management products* - evidence of strategic performance allocation toward *star products* and *young products* which varies with *client power*

Goncalves-Pinto and Schmidt (2013) – *co-insurance* - mutual fund families *coordinate internal trades* in order to protect member funds that are suffering heavy redemptions

Compelling Results

LITERATURE REVIEW (CONT'D)

There at least **two reasons** why further investigation is needed:

1. *Data limitations*

- Due to the lack of availability of transaction-level data, the analysis is usually conducted using returns
- Aggregated across time and across securities

2. *Mechanism*

- Two main channels of performance allocations suggested in the literature → IPO allocations and cross trading
- It is not clear whether:
 - they occur frequently enough to explain the observed transfer of performance
 - there are other, previously unidentified channels

APPROACH

We have data which allow us to *directly test* the existence of such a behavior using *daily trades*

13F management companies trades on behalf of their institutional clients (provided by Ancerno Ltd. / Abel Noser):

- We know that management company X traded for clients A, B, C using brokerage firm Y
 - Delegated portfolios → management companies *make the call*
1. Provide *direct evidence* consistent with strategic performance allocation
 2. Introduce *a new mechanism* that was ignored / couldn't be tested

APPROACH (CONT'D)

Management companies' ADV filings:

It is convenient to **bunch similar trades** across clients - Trading Desk

- Single or multiple brokers depending on trade size
- Same price (**SP**) or different prices
- Shouldn't expect to find **systematic differences** between clients

We specifically **target “bunched” trades**

→ Trades by the **same management company, same day, same stock, same trading direction** for more than one client

Why?

- *High degree of overlapping trades → an **integral part** of the daily trading activity (compared to Cross Trading and IPO allocation)*
- Control for unobservable variables such as stock picking ability, broker talent and trading desk skills

APPROACH - DATA EXAMPLE

<i>Manager</i>	<i>DATE</i>	<i>Stock</i>	<i>Client</i>	<i>NumTRD</i>	<i>Num SHR</i>	<i>\$ VOL</i>	<i>PRC</i>
MGR1	1/1/2010	S1	1	1	500	23,510	47.02
MGR1	1/1/2010	S1	2	1	500	23,530	47.06
MGR1	1/1/2010	S1	3	1	500	23,530	47.06
MGR1	1/1/2010	S1	4	1	1,000	47,080	47.08
MGR1	1/1/2010	S1	5	2	2,000	94,120	47.06
Same Price Benchmark					4,500	211,770	47.06

$$\text{Client 1's PTV (in \%)} = \frac{500 * (47.02 - 47.06)}{(\$ 23,510)} * 1 * -1$$

$$= 0.085\%$$

APPROACH (CONT'D)

1. Compare the prices that clients receive to the *Same price benchmark*
2. Calculate their hypothetical % gains or losses per \$ trade volume and create monthly *PTV* averages
3. Explore whether these differences are systematic
4. Test our hypotheses

HYPOTHESES

H1 - Null Hypothesis:

there are no **systematic** differences in prices across clients

→ *If rejected?*

H2 – the **SPA** hypothesis (**S**trategic **P**erformance **A**llocation or “Favoritism”):

Systematic differences across clients are driven by strategic performance allocation

H3 – the **D**ifferent **T**rading **P**ractices (Alternative) Hypothesis:

Systematic differences across clients are driven by different trading practices (and not favoritism).

RESEARCH QUESTIONS

Step 1 – H1 – Existence of price differences

1.1 Do some clients receive systematically better (worse) prices?

1.2 What is the economic magnitude?

Step 2 – SPA and DTP hypotheses

H2:

2.1 What are the *characteristics* of **management companies** and **Clients** likely to be involved?

2.2 What are the *direct benefits* to the favoring managers and benefited clients?

H3:

3. Alternative explanations which are consistent with the different trading practices hypothesis

SUMMARY OF MAIN RESULTS

1. Does it happen?

1.1 **Systematic differences** between clients in general, and between clients **within** management companies

1.2 **Strong evidence** of out-of-sample persistence in price allocation for a subset of management companies

1.3 The average magnitude can be as large as 0.50% of \$ trade volume

SUMMARY OF MAIN RESULTS (CONT'D)

2. Characteristics and benefits

2.1 Characteristics:

- Management companies with more *trade opportunities*
- Clients with more *trade opportunities* and *higher attention*

2.2 Benefits:

- Managers' direct benefits → *increase in volume* by the favored clients
- Clients' direct benefits → *trading alpha* of 15 bps per month

3. Alternative explanations

Directed Brokerage Arrangements, Price Impact, Trade Commissions, Trading Style, Fill Ratios

DATA

ANCERNO's institutional trading data by delegated portfolio managers (**no holdings**) from 1999 (Q1) -2011(Q3)

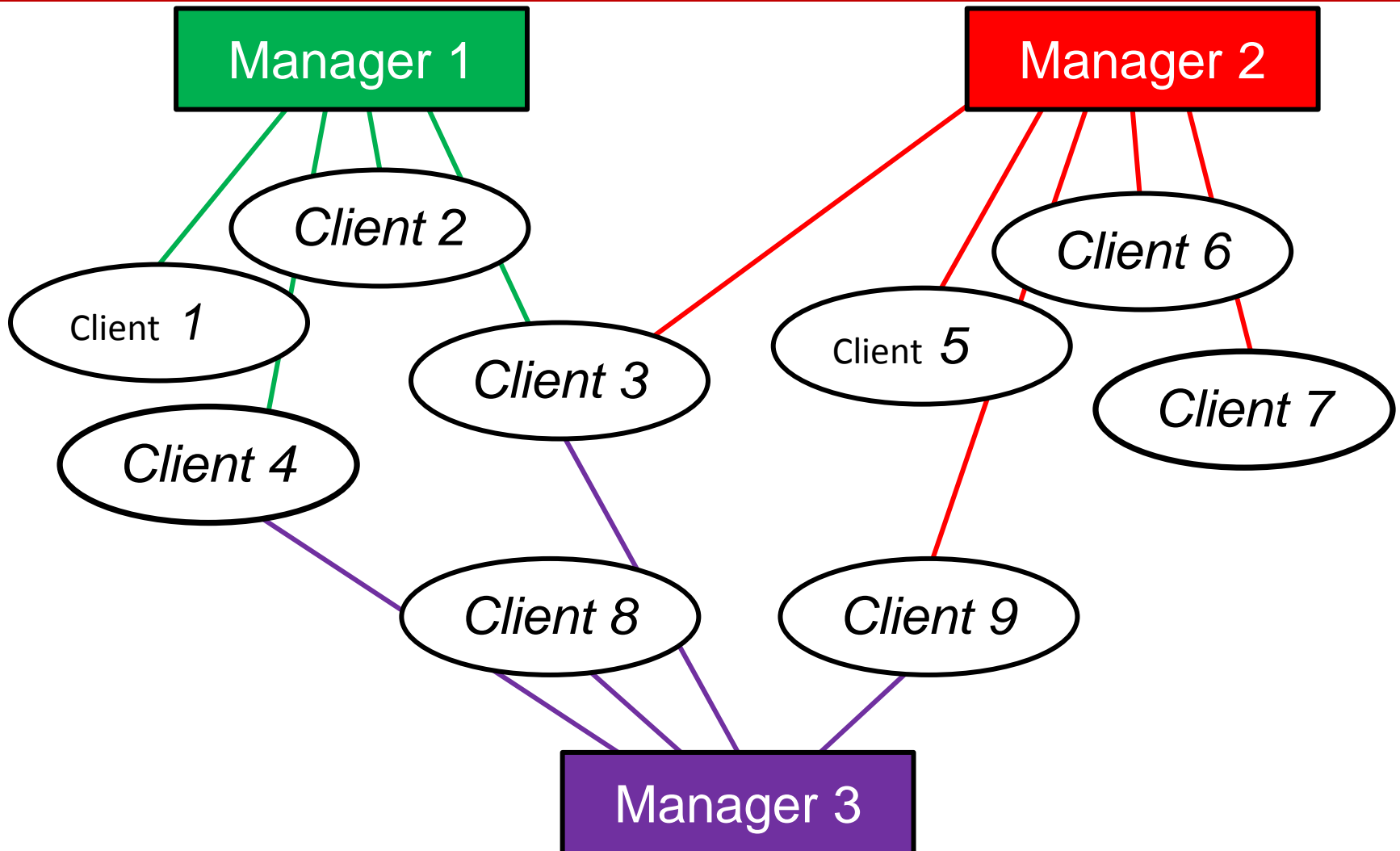
Main variables:

- Number of shares, buy/sell indicator, execution price, trade commissions, Cusip and ticker

Other identifiers:

- Client type → Ancerno's clients are mainly *pension plan sponsors* and *mutual fund families*
- Unique client codes, unique management company codes, unique broker codes
- We received *linking codes* from Ancerno which enable us to link institutional clients to their management companies and brokerage firms

A RICH LINK STRUCTURE



SUMMARY STATS

$\text{Mgr}_m - \text{Cnt}_c - \text{Day}_t - \text{Stock}_s \rightarrow 6,125,500$ daily trades in our “bunched” sample (50% (EW) / 25% (VW) of all Cnt-Mgr trades)
*these ratios are much higher for the “significant clients”

$\text{Mgr}_m - \text{Day}_t - \text{Stock}_s \rightarrow 1,938,500$ unique trades ~ an average of 3.20 clients per bunched trade

488 managers (13F), 825 clients, **5,144 Manager-Client pairs** \rightarrow multiple links

Avg. of **27 months** of bunched trading activity per **Mgr-Cnt pair**

SUMMARY STATS (CONT'D)

Monthly cross-sectional statistics → time-series averages

Table 1

Variables	Mean	Median	SD
Cnt-Per-Mgr	5.16	3.47	4.83
Mgr-Per-Cnt	3.45	2.69	2.97
Num-Trd-In-Mon	46.50	19.81	83.81
Diff-Stocks-Shared-In-Mon	21.25	10.66	36.04
Overlap-Ratio	83.84	100.00	27.06
Overlap-Ratio - VW	42.01	35.24	N/A
Num-Partial-Trds-By-Cnt	5.65	1.07	15.95

*Elton, Gruber and Green (2007), and Blocher (2011)

SIGNIFICANT PTV AVERAGES ACROSS CLIENTS

For each **Manager-Client pair** we calculate the *time series average* of the *monthly PTV series*

Table 2

Frequency P-value	6 and above		
	10%	5%	1%
Num C-M Pairs	3827	3827	3827
% Sig Nominal P-values	17.82%	10.72%	4.94%
% Sig Simulated P-Values	15.56%	10.24%	3.53%
Num Sig Pos	356	230	77
Num Sig Neg	240	162	59
Num Sig Pos-Neg Ratio	1.49	1.42	1.31

*Randomly reshuffle the clients in each Manager-Day-Stock bunched trade, repeat the calculation and store the simulated p-value → 10,000 times

ECONOMIC MAGNITUDE

1. Economic magnitude *conditioning on the clients' time-in-sample*
2. Economic magnitude *conditioning on trades with more opportunities* [$> Ave (H-L)$]

$$H-L \% \text{ spread} = [(\text{Highest Client Price} - \text{Lowest Client Price}) / \text{VW Price}]$$

Table 3

Time in Sample	Significant Positive Clients				Significant Negative Clients			
	ALL		> Ave H-L		ALL		> Ave H-L	
	Ave	SD	Ave	SD	Ave	SD	Ave	SD
1-6 months	0.137	0.325	0.278	0.373	-0.121	0.252	-0.306	0.391
7-12 months	0.124	0.254	0.269	0.349	-0.125	0.195	-0.271	0.241
13-24 months	0.068	0.115	0.199	0.229	-0.058	0.076	-0.202	0.178
25-36 months	0.062	0.073	0.189	0.214	-0.080	0.093	-0.209	0.221
37-48 months	0.053	0.054	0.138	0.100	-0.088	0.149	-0.187	0.200
49-60 months	0.059	0.144	0.154	0.154	-0.045	0.044	-0.131	0.139
More than 60 months	0.027	0.035	0.104	0.092	-0.033	0.035	-0.100	0.072

1. Magnitudes decline with time-in-sample →

- Incentives to subsidize a favored client are *strong when these clients are new*
- Avoid exploiting specific clients for extended periods of time

2. More opportunities → larger transfers

SIGNIFICANT DIFFERENCES WITHIN MANAGEMENT COMPANIES

For each *management company* we calculate the difference between the *top and bottom* clients (based on monthly PTV averages) → **In Sample**

Table 4

Frequency	6 and above		
P-value	10%	5%	1%
Num Mgrs	361	361	361
Nominal P-values	42.38%	26.59%	13.29%
Simulated P-Values	19.94%	14.40%	4.43%
Num Managers - SimPval	72	52	16

*Randomly reshuffle the clients in each Manager-Day-Stock bunched trade, repeat the calculation and store the simulated p-value → 10,000 times

OUT-OF-SAMPLE PERSISTENCE – TEST 1

For each month m and management company j , we use rolling months $m-12$ to $m-1$:

- Rank clients into *PTV Ranking-Quartiles* (Bot, 2, 3, and Top)
- Use the difference between *Top and Bottom* Quartiles to define the **Sig-Mgrs** and **Non-Sig-Mgrs** groups
- Re-rank clients into *Post-Ranking Quartiles* in month m

Perfect Persistence:

1 → 1

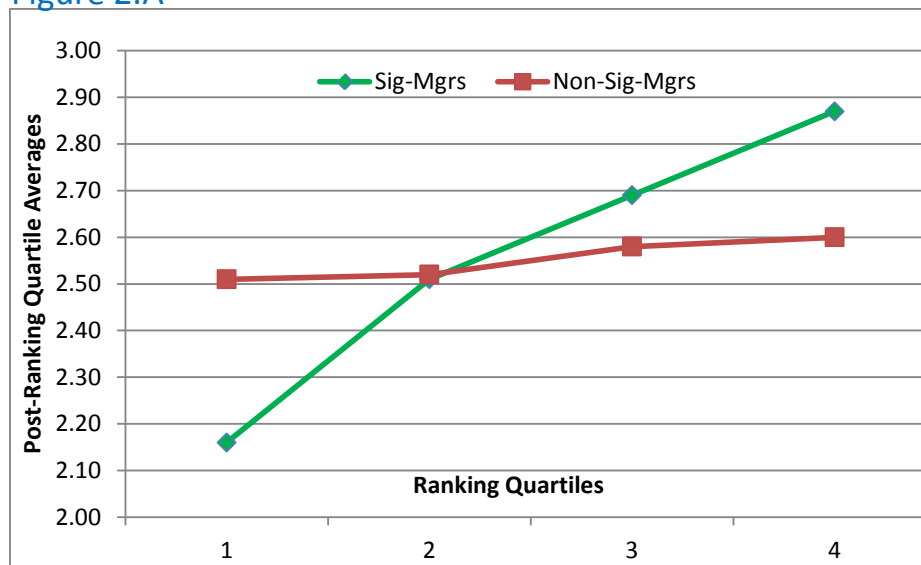
4 → 4

Completely Random:

1 → 2.5

4 → 2.5

Figure 2.A



OUT-OF-SAMPLE PERSISTENCE – TEST 3

Split each Client (within a management company) into *2 equal sub-periods*
 Determine the significant management companies using the *first period*

Table 6

	Non-Sig	Sig	Sig HL
MinFreq	6	6	6
Ranking period			
Top Average	0.173	0.174	0.277
Bot Average	-0.121	-0.167	-0.337
Post Ranking period			
Top Average	-0.002	0.069	0.278
T-stat	0.19	4.06	3.63
Bot Average	0.017	-0.097	-0.182
T-stat	1.10	3.94	5.41
Post Top-Bottom Diff			
T-stat	-0.019	0.165	0.460
	1.02	5.55	5.50
Persistence Ratio Top	-1.1%	39%	100%
Persistence Ratio Bot	-13.8%	58%	54%

CHARACTERISTICS OF SIGNIFICANT MANAGERS

Fama-MacBeth *Probit Models* (153 Mon) at the *Mgr-Month* level

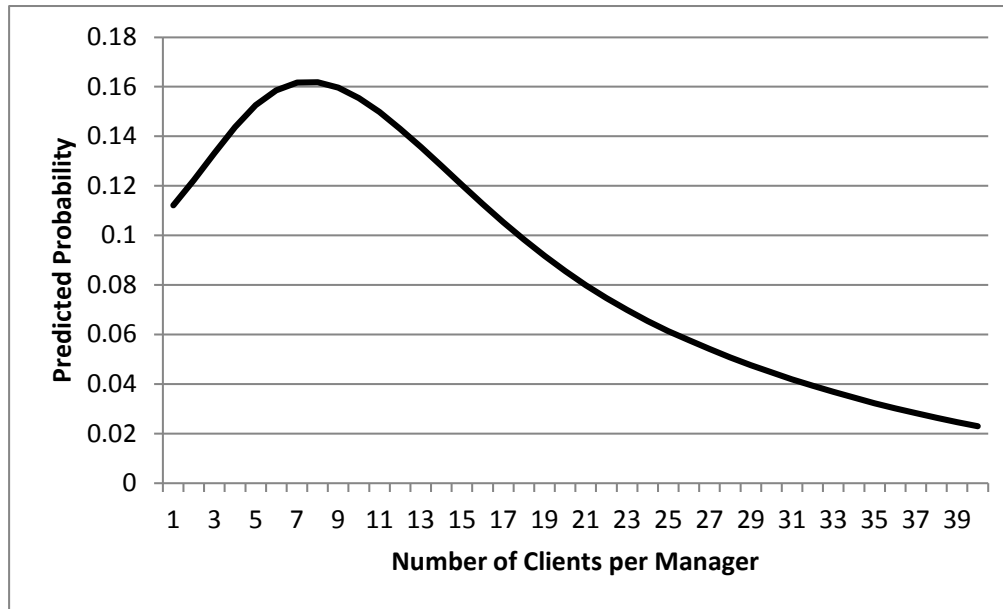
Table 7

1 Sig MGRs
0 Non-Sig MGRs

Variables		(4)	(5)
LnCnt-Per-Mgr	*	0.029	
		0.54	
LnMgr-Per-Cnt	*	-0.179	
		3.98	
LnMgr-Cnt-Shrd-Vol	*	0.020	0.023
		1.80	1.95
LnOverlap-Ratio	*	0.128	0.086
		2.88	2.21
LnNum-FF48-Ind	*	0.14	0.13
		10.40	9.08
Cnt-Per-Mgr	*		0.10
			2.21
Cnt-Per-Mgr2	*		-0.01
			2.15
Mgr-Per-Cnt	*		0.08
			3.09
Mgr-Per-Cnt2	*		-0.01
			3.57
SMP		24,902	24,902
N		153	153

PREDICTED PROBABILITIES OF BEING IN THE SIGNIFICANT MANAGER GROUP

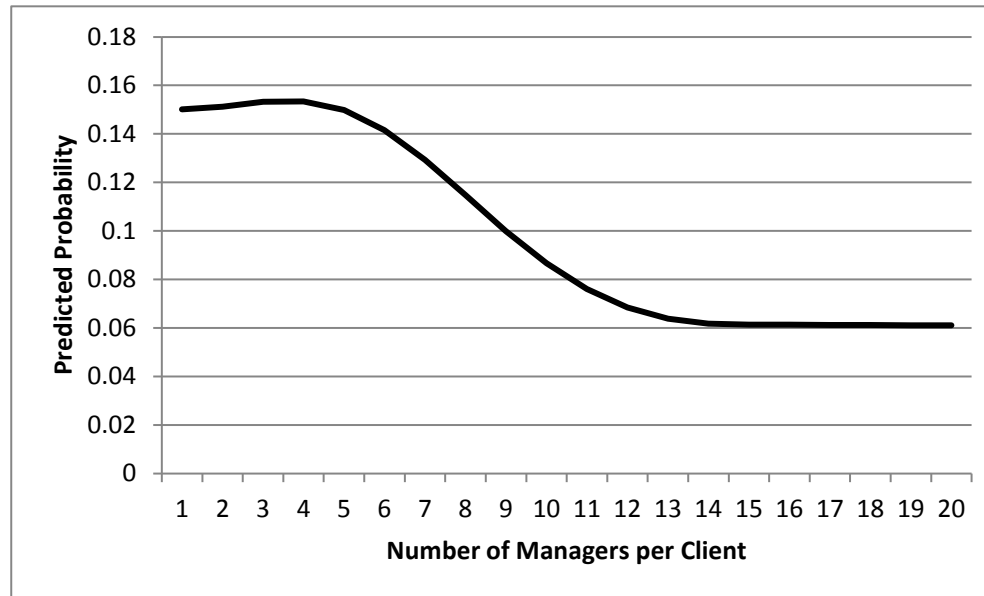
Number of Clients per Manager



We set the **control variables to their means** and **vary our variable of interest** based on the sample range

PREDICTED PROBABILITIES OF BEING IN THE SIGNIFICANT MANAGER GROUP

Number of Managers per Client



We set the **control variables to their means** and **vary our variable of interest** based on the sample range

CHARACTERISTICS OF SIGNIFICANT CLIENTS

Fama-MacBeth *Probit Models* (153 Mon) at the *Cnt-Mgr-Month* level + *MGR DUM*

Table 8

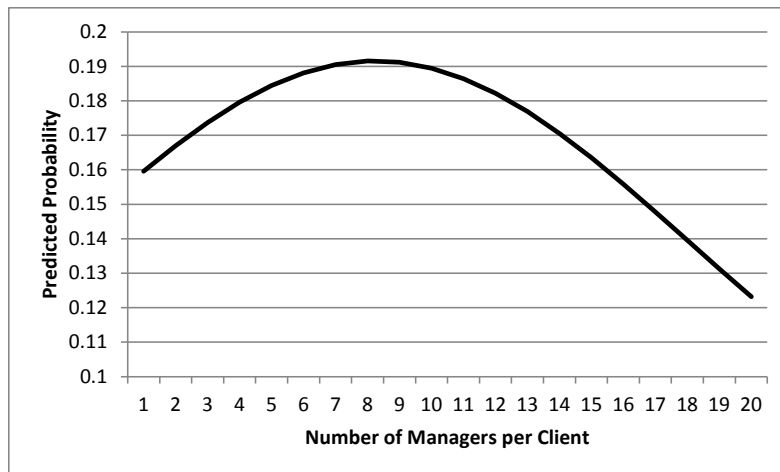
Variables	Positive		Negative	
	(1)	(4)	(6)	(9)
LnCnt-Trd-Relative-Vol	-0.103 3.37	-0.138 4.06	-0.072 2.07	-0.102 2.14
Mgr-Per-Cnt	0.080 5.07	0.076 4.77	-0.053 3.31	-0.074 4.27
Mgr-Per-Cnt2	-0.005 5.19	-0.005 4.86	0.003 3.00	0.004 3.85
LnOverlap-Ratio	0.296 3.34	0.348 3.74	0.010 0.13	0.090 1.28
*		*		*
*		*		*
HBAS		2.956 1.96		8.734 3.50
SD		3.986 3.83		8.135 3.31
*		*		*
Mgr Dummies	YES	YES	YES	YES
SMP	76,953	76,953	57,754	57,754
N	153	153	153	153

1 Sig CNTs
0 Non-Sig CNTs

PREDICTED PROBABILITIES OF BEING A SIGNIFICANT POSITIVE OR SIGNIFICANT NEGATIVE CLIENT

Number of Managers per Client

Positive Clients



Negative Clients



We set the **control variables to their means** and **vary our variable of interest** based on the sample range

BENEFITS

Management Companies – Increase in Volume

Using our sub-period analysis:

- A significant increase of **15%-30%** in trading volume for top clients within the significant management companies
- **Insignificant differences** for the non-significant managers group

Clients – Positive Trading Alpha

For each Client-Manager pair we calculate a monthly “Trade Gain” measure, and find:

- *Positive and significant* difference in performance of **0.15% per month** (t-stat of 1.98) between the **positive-significant** clients and their counterparts
- *Small and insignificant* difference in performance of **-0.02% per month** (t-stat of 0.27) between the **negative-significant clients** and their counterparts

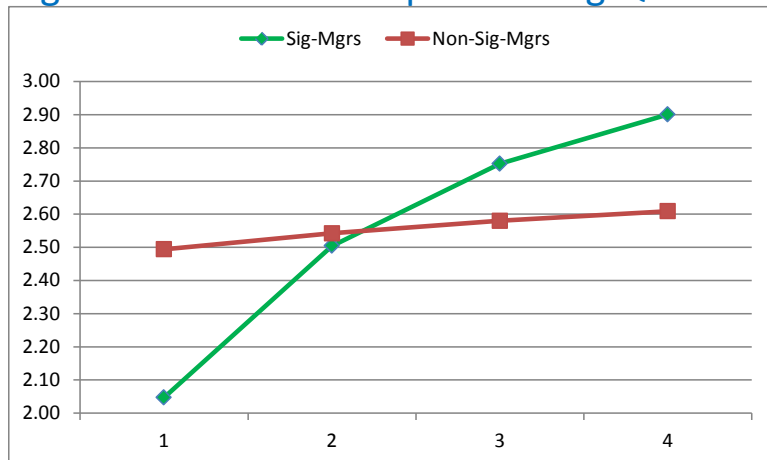
HYPOTHESIS 3 – AE 1 - DIRECTED BROKERAGE ARRANGEMENTS

“Directed brokerage arrangements” - clients may direct the manager to execute their trades with **specific brokers**

→ may not be able to deliver the best execution price

2,478,678 unique $Mgr_m - Cnt_c - Day_t - Stock_s - BKR_b$ “bunched” trades
~ 40% of the sample

Figure 4.A Out-of-Sample Ranking Quartiles



HYPOTHESIS 3 – AE 2 - DYNAMIC COMPENSATION SCHEMES

“Dynamic compensation schemes” - management companies may take trade commissions into account
 → Clients who pay higher commissions may be compensated through better execution prices

Compare the Trade Commissions (in %) and PTV averages

For each management company →

Rank Com Ave → PTV Ave

Table 11

Groups	ALL Mgr		Sig Mgr	
	Com	Ptv	Com	Ptv
Com 1 - Bot	0.077	0.007	0.113	0.002
Com 2	0.141	0.001	0.172	0.007
Com 3 - Top	0.295	0.008	0.289	0.005
Top - Bottom	0.218	0.001	0.176	0.004
t-statistic		0.21		0.45

Rank PTV Ave → Com Ave

Groups	ALL Mgr		Sig Mgr	
	Ptv	Com	Ptv	Com
Top	0.124	0.140	0.128	0.140
Bot	-0.086	0.140	-0.108	0.142
Tom-Bot	0.210	0.000	0.236	-0.001
t-statistic	5.77	0.04	6.69	0.21

HYPOTHESIS 3 – AE 3 - CLIENT HETEROGENEITY

Client heterogeneity within management company might lead to different execution practices

1. Trade Size and Price Impact:

Clients who are allocated larger quantities may *mechanically* be allocated worse prices (be last in line)

→ Conditioning on the management company – the correlation between *trade size* and *execution price* is not significant

2. Different portfolios / Unique Strategies:

Clients whose overall portfolios *differ* may receive *different attention* within a given bunched trade

Use Daniel, Grinblatt, Titman and Wermers (1997) *ranking scores* and Anand, Irvine, Puckett and Venkataraman (2013) *Trading Style measure*

→ We *do not find* statistically significant differences between *significant and non-significant* clients (within a management company)

HYPOTHESIS 3 – AE 3 - CLIENT HETEROGENEITY (CONT'D)

3. *Different Fill Ratios*

Different execution practices may lead to different fill rates

For example:

- Client 1 may have a 90% fill rate on *day 0* and 10% on the following day
- Client 2 may have a 50% fill rate on *day 0* and 50% on the following day

→ Such a difference may suggest that the clients are different in their trading needs

We *do not find* statistically significant differences between *significant and non-significant* clients (within a management company)

CONCLUSION

Contribution

1. Use *trade-level data* to provide *direct evidence* of price allocation by a subset of delegated portfolio managers
2. Reveal a *new mechanism* that was ignored/couldn't be tested before

Overall

1. Strong evidence which indicates that there are systematic differences across clients for a subset of management companies
2. Magnitudes are economically significant - can be as large as 0.50% of \$ trade volume → *lower bound*
3. Explore the characteristics of the management companies and clients likely to be involved, provide evidence of the benefits
4. Rule out alternative explanations

Future Research

Other channels - e.g., *trade allocation*
