Mutual Fund Managers' Learning From Senior Colleagues - Capital Raising Ability versus Active Investment Skill

Job Market Paper

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Abstract

This paper investigates what mutual fund managers learn from senior colleagues by focusing on managers managing multiple funds. I find that having a new senior colleague significantly increases a fund manager's revenues from other funds that she manages. To explore the sources of this increase in revenues, I propose a model that features the capital raising ability of fund managers by extending the active investment skill model (Berk and Green, 2004). Empirical evidence shows that a fund manager's value added from the active investment does not increase after having new senior colleagues and that the net and gross alpha decrease. This is consistent with an increase in the capital raising ability rather than the active investment skill after learning.

Keywords: Mutual Fund Managers; Learning; Investment Skill; Capital Raising; Value Added

JEL Classification: G11; G14; G23

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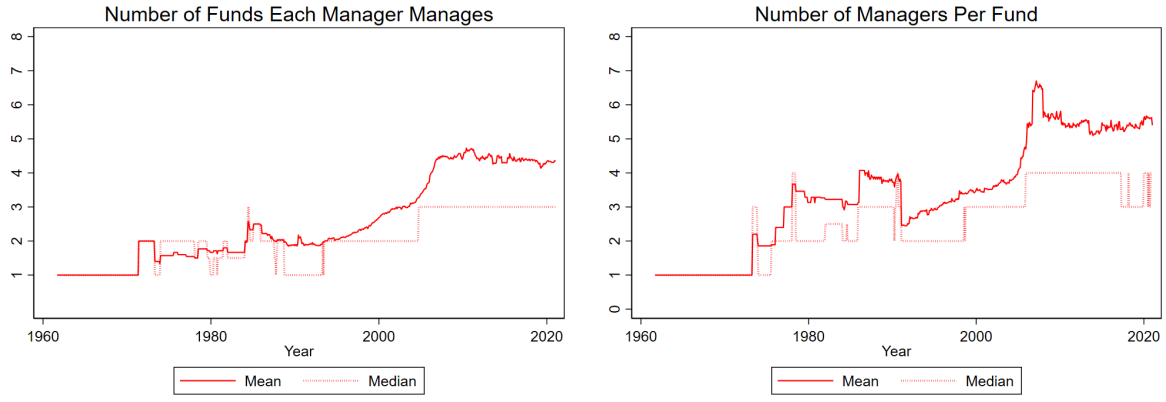
I. Introduction

Multitasking and team management have become more popular for U.S. mutual funds in the past decades. As shown in Panel A of Figure I, an average mutual fund manager managed four funds in the 2010s, compared to only one fund in the 1960s. Panel B shows that an average fund had five fund managers in the 2010s, compared to one manager in the 1960s. In this context, there is a growing literature exploiting the advantages of multitasking and team management. While many existing studies examine how the teamwork of fund managers affects mutual funds' performance (Fedyk et al. (2020); Harvey et al. (2020)), this paper focuses on the fund managers' learning from their colleagues. How professional money managers learn to acquire skills is important to understand, but little work exists due to the difficulty to identify learning. This paper takes advantage of the multiple funds managed by the same manager to identify fund managers' learning from their senior colleagues.

Figure I: The U.S. Mutual Fund Industry

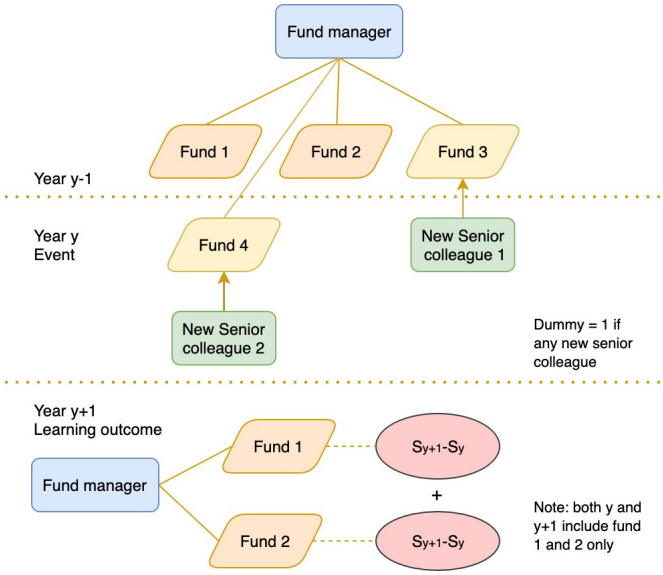
This figure plots the mean and median of the number of funds each manager manages and the number of managers per fund. The sample period is from January 1962 to December 2020.



A key challenge of this study is to separate the outcome of learning from the benefit of team management. I design an identification strategy of a fund manager's learning from senior colleagues, as shown in Figure II as an example. A fund manager manages three funds (fund 1, 2, 3) in year $y-1$. In year y, a new senior colleague 1 joins fund 3 to co-manage

Figure II: Identification Strategy

This diagram shows the identification strategy to examine the learning of fund managers from senior colleagues.



this fund. In the same year, the fund manager joined the managing team of fund 4, which was managed by the new senior colleague 2. When co-managing funds 3 and 4 with new senior colleagues 1 and 2, the fund manager might learn from them. The learning outcome is measured by the increase in the fund manager's revenue from year y to year $y+1$.[1] I include only funds 1 and 2 (exclude funds 3 and 4) to separate the outcome of learning from the benefit of team management. The seniority is measured relatively, not absolutely. The new senior dummy is equal to 1 when the new colleague is more experienced than the manager.[2] I focus on the experience difference in this paper and hypothesis fund managers' experience matters to accumulate investment skill or accumulate client connections.

I find that having new senior colleagues increases a fund manager's revenue from other funds that she manages by $ 504,000 per year, which is approximately the same effect of a

[1]Previous studies imply that the main incentive of mutual fund managers is to generate higher revenues (Berk and van Binsbergen (2015); Ibert et al. (2017)). Other measures (gross alpha, net alphas, and value added in Berk and van Binsbergen (2015)) are used later in this paper to distinguish the type of skill learned by fund managers.

[2]For example, in year y, fund manager 1 has experience of one year, and the new colleague 1 has experience of two years. The new colleague 1 is thus a senior colleague of the fund manager 1.

one-standard-deviation increase in net alphas on revenues. $ 504,000 is approximately 5% of all revenues generated by an average fund manager per year.[3] Moreover, a one-standard-deviation increase in the experience difference between the most senior new colleague and the fund manager leads to a $ 530,000 increase in revenues generated by the fund manager. These results imply that fund managers' experience matters to generate revenues. All tests use manager and time fixed effects and control for fund characteristics so that these findings cannot be explained by any manager-level and time-varying variables, such as the manager's education and business cycles. A question arises: What skill do fund managers acquire from senior colleagues that lead to this substantial increase in revenues?

I further investigate the type of skill acquired by the fund manager. I find that a fund manager's alphas decrease and value added does not change after learning.[4] The evidence suggests that the active investment skill does not improve. I then hypothesize that fund managers learn to raise capital from investors who require low net alphas, considering that there is a large cross-sectional dispersion in net alphas and fees of mutual funds (e.g., Carhart (1997); Cooper et al. (2021)).[5] To exploit this hypothesis, I relax the assumption in Berk and Green (2004)'s model that the capital provision is competitive (i.e., the assumption that the net alpha is zero) and allow variations in net alphas across fund investors.[6]

The model predicts that when the capital for the active investment is abundant (as in Berk and Green (2004)), an improvement in the capital raising ability decreases the net alpha that goes to fund investors and increases fund inflows. It increases the fund manager's total revenues but not revenues from the active investment (value added). Gross alpha decreases because fund inflows dilute revenues from the active investment. In contrast, an improvement in the active investment skill increases both total revenues and the value added, and increases

[3]The magnitude of increased revenues is underestimated given that I excluded joint working funds in the identification strategy.

[4]Berk and van Binsbergen (2015) propose value added as a measure of active investment skill. Value added is the product of gross alpha and asset under management).

[5]The skill to raise capital in this paper is broadly defined as all skills that could lower the required net alpha of a client, such as client connections, marketing skills, customer service, and diversification service.

[6]Consistently, the model in Garleanu and Pedersen (2020) shows that the net alpha depends on the number of noise allocators.

gross alphas.

Using my identification strategy, I find that total revenues increase, value added does not increase, and both net alphas and gross alphas decrease after learning from senior colleagues. These results consistently suggest that there is an increase in the capital raising ability after having new senior colleagues, but no increase in the active investment skill.

Moreover, the empirical evidence shows that fund flows and fees increase after having any new senior colleague. Intuitively, the improved capital raising ability enables fund managers to attract more fund flows. The increased fee indicates that fund managers have an edge to charge higher fees after learning from senior colleagues. Even a higher fee is charged, investors allocate more capital to the fund manager. This evidence is consistent with the model of Gennaioli et al. (2015), which suggests that investors' trust allows managers to charge high fees and deliver low net alphas.

Finally, I examine which fund managers are more likely to learn from senior colleagues. Additional evidence shows fund managers who manage small-size funds, generate poor past net alpha, and belong to a fund family with many funds under management, learn more from senior colleagues and generate higher revenues. Furthermore, when a fund manager has new colleagues who are all more junior, the manager loses revenues in the other funds. One possibility is that senior managers share client connections with junior colleagues, which is in the interest of the fund firms to maximize total firm revenues. The value added does not differ significantly, suggesting that the active investment skill cannot be learned from junior or senior colleagues. Further robustness check shows that the learning effect of capital raising ability holds in different periods.

This paper highlights the importance of fund managers in raising capital. Capital raising in the mutual fund industry focuses on the role of investment advisors and brokers, who direct investors toward the mutual funds (Bergstresser et al. (2009); Christoffersen et al. (2013); Roussanov et al. (2020)). Others emphasize the net alpha because higher net alphas lead to higher fund flows (Sirri and Tufano (1998); Lynch and Musto (2003); Choi et al.

(2016)). I provide evidence that fund managers also play a role in raising capital, evidenced by the learning from senior colleagues. The finding that fund managers learn from senior colleagues to raise capital also indicates that seniors have the capital raising ability. This paper establishes the role of managers' experience to raise capital in the mutual fund industry.[7] The capital raising ability of fund managers can help us understand why the average net alpha in the mutual fund industry is negative (Carhart (1997); Fama and French (2010)).

This paper is related to the literature on investors' learning. Some have studied rational learning theories (Mahani and Bernhardt (2007); Linnainmaa (2011)) while others suggest incomplete learning (Bailey et al. (2011); Chiang et al. (2011); Choi et al. (2016)). A large number of papers focus on the learning of retail investors and mutual fund investors. To my knowledge, this paper is the first to examine the learning among professional money managers. I design an identification strategy to capture the learning, and I use a model to interpret which specific skills managers improve after learning.

This paper advances the literature on the advantages and disadvantages of the popularity of multitasking and team management structure. Some papers show that team-managed funds underperform (e.g., Chen et al. (2004)). Others find that the team management structure enables some funds to outperform (e.g., Zambrana and Zapatero (2020)), lower the decreasing returns to scale (Blake et al. (2013); Harvey et al. (2020)), reduces uninformed overconfident trading (Fedyk et al. (2020)), and reduces portfolio pumping (Patel and Sarkissian (2021)). I add another perspective that the learning effect provides a new explanation for the shift to decentralized investment management in the past decades.

Finally, this paper contributes to the literature on mutual fund manager skill. Many studies focus on the existence of the mutual fund skill (Jensen (1968); Gruber (1996); Kosowski et al. (2006); Fama and French (2010)). Others investigate where the skill comes from (Daniel et al. (1997); Coval and Moskowitz (2001); Kacperczyk et al. (2005); Cohen et al. (2008)). The learning of fund managers and the evolution of skill are not largely exploited. Some

[7]Studies on the manager tenure mainly focus on fund performance and risk-taking (e.g., Chevalier and Ellison (1999)).

theoretical models assume that the active investment skill is constant (Berk and Green (2004); Pástor et al. (2020). Empirically, Kacperczyk et al. (2014) suggest that the mutual fund managers' skill is time-varying during different business cycles. Kempf et al. (2017) study fund managers' learning through past experience and show that managers outperform in industries where they have obtained experience. This paper provides evidence that learning from seniors does not improve the active investment skill, suggesting that the active investment skill is not easily learned.

The remainder of the paper proceeds as follows. Section II proposes an identification strategy of a fund manager's learning from senior colleagues. Section III defines fund manager variables that are used in the model. Section IV develops the theory and hypotheses. Section V outlines the data and variable constructions for the empirical study. Section VI describes the empirical model specification and analyzes the main empirical results. Section VII examines the learning by fund characteristics. Section VIII presents additional results and robustness checks. Section IX concludes.

II. Identification Strategy

The identification strategy of learning from new senior colleagues follows Figure II, illustrated in the introduction. New colleagues could be more junior or senior than the fund manager j. The experience difference between the fund manager and the colleague k in a given tenure year y of the manager j is

$$D_{j,k,y} = Tenure_{k,y} - Tenure_{j,y}, \tag{1}$$

where the subscript k denotes the fund manager j's colleague k, $Tenure$ is the number of years of experience a mutual fund manager has, y is the manager j's tenure year when the fund manager has any new colleague. The time unit is not based on the calendar year but based on the manager tenure of the fund manager j. For example, when the fund manager

started the job in May 1994, $y = 1$ during the period between May 1994 and April 1995.

I construct a dummy variable $\mathbb{1}^{senior}$, which is equal to one if the fund manager has any new senior colleague in the manager's tenure year y, and zero otherwise.[8] I also construct a variable to capture the experience difference (number of years) between the fund manager and the manager's most senior new colleague. For example, if a fund manager has two new colleagues: one is 10 years more senior, and another is 5 years more junior, then $D_{j,k,y}$ is 10. If no new colleague is more senior than the fund manager, $D_{j,k,y}$ is set as a missing value. $D_{j,k,y}$ enables us to study how one year increase in the manager's most senior colleague's experience affects the fund manager's capital raising ability/active investment skill.

In this paper, I focus on the experience difference. I hypothesis that managers with more experience have accumulated investment skills for years and could share investment ideas/information with less experienced managers. Moreover, managers might have more client bases than managers who have less experience. Senior managers may share clients with juniors at the expense of seniors' interests, while it is in the interest of the fund firms to maximized firm revenues (e.g., Berk et al. (2017)). When client sharing happens, it would be confused when combining new senior and new junior colleagues. Therefore, this paper mainly focuses on the learning among fund managers with different years of experience.

III. Definitions

This section defines fund manager variables that are used in the model. For simplicity, I omitted the subscripts for the fund manager j and time t. Most notations in this paper follow Berk and van Binsbergen (2015).

Let R^n denote the return over the riskless asset earned by investors. Investors have another best alternative investment opportunity, R^B, called the benchmark return. R^n can

[8]The new senior colleague is the first time the fund manager starts to work with. For example, fund manager 1 worked with colleague 1 in fund 1 in 2000, then colleague 1 left fund 1 in 2002. When manager 1 worked again with colleague 1 in fund 2 in 2010, I did not treat colleague 1 as a new colleague to fund manager 1 in 2010.

be decomposed as the benchmark return R^B, and a deviation from the benchmark α^n:

$$R^n = R^B + \alpha^n, \tag{2}$$

where α^n is the unconditional mean of benchmark adjusted return earned by investors (net alpha).

Let α^g denote the unconditional mean of the benchmark adjusted return earned by a fund before fees are deducted (gross alpha). Gross alpha is the sum of the net alpha and the fee:

$$\alpha^g = \alpha^n + f, \tag{3}$$

where f is the percentage fee that the fund manager charges to manage the funds for investors.

Let q denote the assets under management (AUM), which is the real fund size that a fund manager manages. The total revenue a fund manager earns, V, is the product of AUM and the percentage fee:

$$V = qf. \tag{4}$$

Let V^A denote the revenue a fund manager earns from the active investment skill, called value added. Value added is proposed by Berk and van Binsbergen (2015), which is the dollar value a fund manager adds over the benchmark:

$$V^A = q\alpha^g. \tag{5}$$

As value added is a measure of active investment skill, the difference between the total revenue and value added, V^C, is the revenue a fund manager earns from raising capital:

$$V^C = V - V^A \tag{6}$$

IV. Model and Hypotheses

This section develops a model to understand the type of skill acquired by the fund manager after learning from senior colleagues: (1) the capital raising ability, (2) the active investment skill. I briefly outline the model setting and present the hypotheses for the main empirical tests.

IV.A. Capital Raising Ability

The capital raising ability of fund managers is the key difference between this model and the model in Berk and Green (2004) and Berk and van Binsbergen (2015). Berk and Green (2004) assume the competitive provision of capital, which keeps net alphas of all funds constant at zero, and fees equal to gross alphas in equilibrium. However, the empirical evidence shows that the average U.S. domestic equity mutual funds' net alpha is negative (Carhart (1997); Fama and French (2010)). Moreover, Cooper et al. (2021) document that the dispersion of fees is large and persistent over time, and the relation between fund fees and net alphas is approximately -1. These evidence suggest that there is a large dispersion in the net alphas required by fund investors. Therefore, fund managers should be rewarded for raising capital that requires low net alphas.[9]

In that context, this paper relaxes the assumption in Berk and Green (2004) that the capital provision is competitive to allow variations in net alphas required by fund investors.[10] The net alpha is modeled as an increasing function of the assets under management q:

$$\alpha^n = -c + kq, \tag{7}$$

where c is positive, measuring the ability of a fund manager at raising capital. $-c$ represents

[9]The skill to raise capital in this paper is broadly defined as all skills that could lower the required net alpha of a client, such as client connections, marketing skill, customer service, and diversification service.

[10]Consistently, the model in Gârleanu and Pedersen (2018) shows that the asset-weighted average net alpha is negatively related to the number of noise allocators.

the cost of capital of the first cent a fund manager raised relative to the benchmark cost of capital in the market. A fund manager with a larger c can raise capital at a lower cost. k is positive, measuring the speed at which the average cost of capital (net alpha) of the fund manager increases with the total amount of capital raised (assets under management q).

When a fund manager does not have the active investment skill, all raised capital is indexed such that the gross alpha is zero. The fee charged by the fund manager is the difference between the gross alpha and the net alpha in Eq. (7)

$$f^C = 0 - \alpha^n = c - kq. \tag{8}$$

From Eq. (8), we can observe that index funds with the same fee have different assets under management due to their heterogeneous ability at raising capital (c differs).

The revenue generated by the fund manager from raising capital is

$$V^C = f^C q = cq - kq^2. \tag{9}$$

IV.B. Active Investment Skill

The model of the active investment skill follows Berk and Green (2004) and Berk and van Binsbergen (2015). When a fund manager actively invests the capital raised from investors, there is a decreasing returns to scale in the mutual fund industry (Chen et al. (2004); Pástor and Stambaugh (2012); Pástor et al. (2015)). The increase in AUM is associated with a decrease in the gross alpha. So I assume that the gross alpha that a fund manager generates by active investment is given by

$$\alpha^{g^A} = a - bq^A, \tag{10}$$

where q^A is the AUM a fund manager chooses to actively manage. a is interpreted as the alpha on the first cent the manager actively invests. b captures the decreasing returns to scale the manager faces. Both a and b are positive.

As in Berk and van Binsbergen (2015), value added, the revenue a fund manager earns from the active investment skill, can be written as

$$V^A = q^A \alpha^{g^A} = q^A(a - bq^A), \tag{11}$$

IV.C. Hypotheses

I now outline the empirical hypotheses to distinguish between the capital raising ability and the active investment skill. In the paper, I discuss the hypotheses when the capital for the active investment is abundant (i.e., AUM is larger than the optimal actively invested AUM) as in Berk and Green (2004). The hypotheses when the capital for the active investment is not abundant are similar. All proofs and the extension when capital is not abundant are in Appendix A.

Table I summarizes the main hypotheses to distinguish between the capital raising ability and the active investment skill, using five variables: the total revenue, the revenue from the active investment (value added), the net alpha, the gross alpha, and the fund flow.[11]

Table I: Summary of Hypotheses - Capital is Unconstrained

This table reports the summary of hypotheses to distinguish between the capital raising ability and the active investment skill.

	Learn to Improve	
	Capital Raising Ability	Active Investment Skill
Revenue (Total)	+	+
Revenue from Active Investment	no effect	+
Net Alpha	-	no effect
Gross Alpha	-	+
Fund Flow	+	no effect
Fee	+ / -	+

First, the model predicts that either the increased capital raising ability or the increased

[11] Empirically, the change in AUMs is attributed to fund flows and capital appreciation (depreciation). Capital appreciation (depreciation) is not considered in this setting, so I use the fund flow to measure the change in AUMs.

active investment skill can increase the total revenue generated by the fund manager in the next year. The total revenue can be used to test whether having new senior colleagues incurs any learning. If the total revenue does not increase after having new senior colleagues, there is no evidence of learning. I have the following hypothesis:

H1 (Total revenue): The total revenue generated by a fund manager increases when 1) a fund manager's ability to raise capital increases, or 2) a fund manager's active investment skill increases.

Second, the value added can be used to test directly whether fund managers' active investment skill increases because value added is a measure of the active investment skill. The value added, associated with the total revenue, can be used to distinguish between the capital raising ability and the active investment skill. I have the following hypothesis:

H2 (Value added): 1) The value added does not change when a fund manager's ability to raise cheap capital increases; 2) the value added increases when a fund manager's active investment skill increases.

Third, the net alpha and the gross alpha are derived as a decreasing function of the capital raising ability. In contrast, the net alpha and the gross alpha increase when the active investment skill increases. I have the following hypothesis:

H3 (Net alpha and gross alpha): 1) Both the net alpha and gross alpha decrease when a fund manager's ability to raise cheap capital increases; 2) the net alpha does not change and the gross alpha decreases when a fund manager's active investment skill increases.

Finally, when the fund manager's capital raising ability increases, more investors are persuaded to invest with this fund manager even though the capital supply is sufficient. In contrast, when the capital is sufficient, the fund flow is a function of capital raising ability rather than a function of active investment skill. I have the following hypothesis:

H4 (Fund flows): 1) Fund flows increase when a fund manager's ability to raise capital increases; 2) Fund flows do not change when a fund manager's active investment skill increases.

V. Data Set and Variable Constructions

V.A. Data Set

The data set is a match of two databases. First, I obtain open-ended equity mutual fund data from CRSP Survivorship Bias Free Mutual Fund Database. CRSP provides mutual fund information on fund returns, different types of fees, AUMs (TNA), turnovers, and investment objectives. I exclude bond, money market, ETFs/ENFs, index funds, and any fund observations before the fund's TNA reached $5 million following Berk and van Binsbergen (2015). Given that many funds have multiple share classes, I merge those funds into a single fund. Second, I obtain mutual fund manager information from Morningstar Direct that contains a complete list of fund managers for each fund. I merge CRSP with Morningstar Direct to obtain a data set with 5,464 funds and 13,244 managers. The final sample includes actively managed equity funds and managers from January 1962 to December 2020.[12]

V.B. Variable Constructions

I first estimate the variables at the fund level and then aggregate them to the manager level. The constructions of total revenues, value added, net alphas, and gross alphas are described in Section III. To estimate the alphas (mutual funds' benchmark-adjusted returns), I obtain the benchmark return on fund i at month t as

$$R_{it}^{B} = \sum_{l=1}^{n(t)} \hat{\beta}_{i}^{l} R_{t}^{l}, \tag{12}$$

where $n(t)$ is the number of Vanguard index funds available at month t, and R_t^l is the excess return of the index fund l at month t, and $\hat{\beta}_i^l$ is obtained by the linear projection of the excess return of fund i onto the excess return of benchmark l. In the main analysis, the benchmark of mutual funds is the 11 Vanguard index funds, following Berk and van

[12]For completeness, I present similar results for the domestic sample of actively managed U.S. equity funds with 3,226 funds and 8,100 managers from January 1962 to December 2020 in the Online Appendix.

Binsbergen (2015). Index funds were tradeable and accounted for transaction costs at the time by investors, and Vanguard index funds are regarded as the least costly alternative investment opportunities. 11 Vanguard index funds include funds with different caps (small, mid, large), growth/value funds, international funds, and a balanced fund.[13] In the robustness check, I use Fama-French-Carhart's four factors to adjust the mutual funds' gross returns. The reason not to use the traditional risk-based approach in the main analysis is that the transaction cost is not included in risk factors, and some factors were discovered after many active mutual funds were launched.[14]

I then compute fund flows to the fund i at time t as

$$flow_{it} = q_{it} - q_{i,t-1}(1 + R^n_{it}), \tag{13}$$

where q_{it} is the assets under management (AUM), R^n_{it} is the return over the riskless asset earned by investors.

B.1. Aggregate to Manager-Level Variables

Some funds are managed by multiple managers, so we cannot credit all fund revenues to one fund manager. I construct manager-level variables related to quantity (AUM, flow, revenue, and value added) as follows. When a fund is managed by several managers, I divide the fund's AUM equally across each manager, and sum all the funds that manager j manages

$$q_{jt} = \sum_{i \in \Omega jt} \frac{q_t}{Mgrn_{it}}, \tag{14}$$

where $Mgrn_{it}$ is the number of fund managers in the mutual fund i at month t. The fund flow, revenue, and value added are constructed in the same way.

[13] The tickers for the Vanguard index funds include VFINX, VEXMX, NAESX, VEURX, VPACX, VVIAX, VBINX, VEIEX, VIMSX, VISGX, and VISVX.

[14] Vanguard index funds are obtained from CRSP Database. Factor data comes from Kenneth French's website.

It is improper to divide across managers for variables as returns and ratios (alphas and expense ratios). I take an equal-weighted mean of these ratio variables across all funds under management.

$$\alpha_{jt}^{n} = \frac{1}{I_j} \sum_{i \in \Omega jt} \alpha_{it}^{n}, \tag{15}$$

where I is the total number of funds that fund manager j manages.

Finally, I aggregate manager-level variables at the calendar time t (monthly observations) to the manager tenure year y. The learning outcome is the change in fund characteristics from tenure year y to $y+1$ after learning from senior colleagues in tenure year y. Let $\Delta S_{j,y+1}$ denote the change in fund characteristics for fund manager j from tenure year y to $y+1$. Fund characteristics include all variables defined in Section III.

Table II reports summary statistics of mutual fund managers and the new senior colleagues annually. Panel A shows the manager-level fund characteristics. An average fund manager generates \$9.58 million revenues per year. An average manager's value added (active investment skill) is \$6 million per year. Panel B shows the increased fund variables after excluding the new colleagues' funds. Mutual fund managers' total revenue, AUM, fund flows, and expense ratio on average increase slightly next year, whereas value added, net alpha, and gross alpha on average decrease slightly next year. Panel C shows that the mean of the new senior colleague dummy is 0.12, suggesting that 12% of the years in which fund managers have new senior colleagues. The experience difference between the fund manager and her most senior colleague is, on average, 8.67 years.

Table II: Summary Statistics

This table shows summary statistics for the sample of active equity mutual funds from January 1962 to December 2020. The unit of observation is the manager-tenure year. Panel A reports the fund variables. Panel B reports the change in fund variables after excluding the new colleagues' funds. Panel C reports new colleague variables defined in Section II. Value added, net alpha, gross alpha, and fund flows are winsorized at the 1st and 99th percentiles.

	Observations	Mean	SD	Min	Max
Panel A: Manager-Level Fund Characteristics ($S_{j,y}$)					
Total Revenue ($ mil)	107,702	9.58	27.28	0.001	1,142
Value Added ($ mil)	107,744	6.00	165.20	-16,488	8,242
Net Alpha (%)	107,916	-0.62	7.37	-73.17	73.57
Gross Alpha (%)	107,916	0.61	7.37	-71.43	75.20
AUM ($ mil)	108,020	13,380	45,222	5.34	1,704,000
Fund Flows ($ mil)	107,962	2,106	7,166	-16,952	336,178
Expense Ratio (%)	107,891	1.24	0.45	0.003	9.74
Panel B: Change in Fund Characteristics ($\Delta S_{j,y+1}$)					
$\Delta TotalRevenue$ ($ mil)	84,531	0.73	8.37	-263	453
$\Delta ValueAdded$ ($ mil)	84,576	-0.42	221.80	-24,328	11,064
$\Delta NetAlpha$ (%)	84,683	-0.23	9.22	-99.49	131.40
$\Delta GrossAlpha$ (%)	84,674	-0.21	9.21	-99.40	131.90
ΔAUM ($ mil)	84,824	1,212	12,440	-588,376	640,433
$\Delta FundFlows$ ($ mil)	84,588	259	2,157	-137,740	153,911
$\Delta ExpenseRatio$ (%)	80,896	0.03	0.27	-3.85	9.19
Panel C: Colleague Measures					
$\mathbb{1}_y^{senior}$ (Senior Colleague Dummy)	84,693	0.12	0.32	0	1
$D_{j,k,y}$ (Experience Difference)	9,768	8.67	6.51	0	44

VI. Learning From Senior Colleagues

This section first describes the empirical model specification, then shows the main results and analyzes the specific skills fund managers acquire after learning from senior colleagues.

VI.A. Model Specification

The main model specification is as follows

$$\Delta S_{j,y+1} = a_t + a_j + b_1 \mathbb{1}_{j,y}^{senior} + b_2 X_{j,y} + \epsilon_{j,y}, \tag{16}$$

where $\Delta S_{j,y+1} = S_{j,y+1} - S_{j,y}$ is the increased skill of fund manager j after excluding the new senior colleagues' funds as highlighted in Figure II, a_t is a time fixed effect (calendar time), a_j is a manager fixed effect, $\mathbb{1}_{j,y}^{senior}$ is equal to one if the fund manager has any new senior colleague in the manager j's tenure year y and zero otherwise, $X_{j,y}$ is a vector of control variables including the manager tenure, AUMs, and previous net alphas.

$\Delta S_{j,y+1}$ captures the amount of increased skill. It is a value measure, not a percentage measure. The reason is that a fund manager attracts fund flows from 100 to 1000 is different from 10000 to 10900. If I use the percentage measure, the increased skill of the former is much higher than the latter, while the learning of the former is not as large as the latter. One could argue that the value increment is neither a good measure of learning. To address this problem, I add AUM as a control variable such that the change in value measure can be explained by AUM. Another reason to include AUM as a control variable is that size is negatively related to alpha due to the decreasing returns to scale (Chen et al. (2004); Pástor et al. (2015)). When I use alpha as the dependent variable, including AUM as a control variable can address the problem of decreasing returns to scale.

Moreover, I include the manager fixed effect in the model to address an endogeneity issue. One could argue that some fund managers keep getting senior colleagues while others do not. It is possible that more skilled managers are more likely to have new colleagues.

I use the manager fixed effect by comparing the increased skill after getting new senior colleagues within each manager. This manager fixed-effect model can be described as a given fund manager solving a series of single-period problems. Manager fixed effect can also solve potential problems related to the heterogeneity of the fund manager, such as education and innate ability.

Finally, the coefficient b_1 captures the economic magnitude of learning from colleagues. When it is significantly positive, the fund manager has higher increased skill when having new senior colleagues.

VI.B. Total Revenues and Value Added

Table III reports the change in revenues and value added. The first column shows that there is a higher increase in revenues for a given manager after having new senior colleagues, controlling for manager and time fixed effects and other characteristics. With new senior colleagues, a fund manager generates $ 504,000 higher revenues in the next year compared to without new senior colleagues. As Table II shows, an average fund manager generates $9.58 million revenues per year. Thus, the economic magnitude of learning from senior colleagues to generate revenues is approximately 5% ($0.504 mil/$9.58 mil) per year. It is worth noting that the magnitude of increased revenue is underestimated since I excluded the joint working funds in the analysis. The second column shows that a one-standard-deviation increase in years of experience of the most senior colleague leads to a $ 530,000 increase in revenues generated by the fund manager. According to hypothesis *H1*, the evidence of increased revenues suggests that the fund manager's ability to raise capital improves, or the active investment skill improves after learning from senior colleagues.

The third and fourth columns show that there is no significant difference for the fund manager when she has and does not have new senior colleagues. According to hypothesis *H2*, the finding implies that fund managers do not learn to improve the active investment skill from senior colleagues. The increase in revenues, therefore, indicates that fund managers

learn from senior colleagues to raise capital. There are many possibilities that the capital raising ability is increased. For example, junior managers may have limited networks of clients, and they know more clients from the senior colleague who shares client connections. Junior managers may also improve the communication ability to maintain old clients even with poor performance (Gennaioli et al. (2015)). They could also learn networking skills to attract new clients.

The third row of Table III shows that the past net alpha positively predicts the change in revenues. This is consistent with the theory and empirical evidence that investors chase past performance (Sirri and Tufano (1998); Lynch and Musto (2003); Choi et al. (2016)). This paper shows that learning from senior colleagues also explains the increase in revenues in the next year. I compare the effects of past performance with the improved capital raising ability on increasing revenues. I standardize the net alpha in the tenure year y to compare the economic magnitude. The result shows that the effect of having any new senior colleague on a manager's revenues is similar to the effect of a one-standard-deviation increase in net alphas (0.504 compared to 0.567). Table II shows that the chance of getting any senior colleague dummy in my data set is about 0.12 (the mean of $\mathbb{1}_y^{senior}$).

VI.C. Net Alphas and Gross Alphas

Table IV reports the change in net and gross alphas. Hypothesis *H3* shows that after having new senior colleagues, both net and gross alphas increase if the fund manager improves the active investment skill, whereas alphas decrease if the fund manager improves the capital raising ability. The first column shows that net alpha decreases after getting any new senior colleague. It suggests that the fund manager's capital raising ability increases while the active investment skill does not improve. The third column also confirms the capital raising hypothesis that managers have a lower gross alpha after getting new senior colleagues. There is no difference in how experienced new senior colleagues are for the net alpha and gross alpha, as shown in the second and fourth columns.

Table III: Revenues and Value Added

This table reports the annual change in revenues. $\Delta Revenue_{y+1}$ is the change in revenues ($ million) from the manager's tenure year y to $y+1$. $\Delta ValueAdded_{y+1}$ is the change in value added ($ million) from the manager's tenure year y to $y+1$. Value added is also known as the revenue from the active investment skill. $\mathbb{1}_y^{senior}$ is a dummy variable that is equal to one if the fund manager has any new senior colleague in the manager's tenure year y, and zero otherwise. $D_{j,k,y}$ is the standardized experience difference between the fund manager and the manager's most senior new colleague. $NetAlpha_y$ is the standardized average net alpha of all funds managed by the fund manager in year y defined by Eq. (15); $Size_y$ is the standardized total assets under management of all funds managed by the fund manager in the tenure year y defined by Eq. (14); $Tenure_y$ is the standardized total number of years since the fund manager starts the career in the tenure year y. The sample period is from January 1962 to December 2020. Manager and time-fixed effects are included in all regression specifications. t-statistics clustered by manager × time are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	$\Delta TotalRevenue_{y+1}$		$\Delta ValueAdded_{y+1}$	
$\mathbb{1}_y^{senior}$	0.504***		0.978	
	(3.52)		(0.43)	
$D_{j,k,y}$		0.530***		0.606
		(3.19)		(0.17)
$NetAlpha_y$	0.567***	0.326*	-30.501***	-22.466***
	(6.77)	(1.97)	(-9.66)	(-4.20)
$Size_y$	-2.330***	-4.062***	-25.692	23.385
	(-3.59)	(-3.92)	(-1.47)	(1.09)
$Tenure_y$	3.593	6.143	-26.865	123.107
	(0.56)	(0.24)	(-0.45)	(0.84)
Observations	82,725	7,761	82,833	7,768
R-squared	0.163	0.358	0.056	0.307
Manager FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES

VI.D. Fund Flows and Fees

Table IV reports the change in fund flows and fees. The first column shows that having new senior colleagues explains a higher increase in fund flows in the next year. In particular, senior colleagues can help a given manager attract $ 91.66 million more fund flows per year. The second column shows that a one-standard-deviation increase in years of experience of the most senior colleague leads to a $ 90.524 million increase in fund flows in the next year, highlighting the role of new colleagues' experience in attracting clients. According to hypothesis *H4*, the result for getting senior colleagues confirms the increase in the capital raising ability rather than the active investment skill. I then compare the economic magnitude of learning with

Table IV: Alphas

This table reports the annual change in net alphas and gross alphas. $\Delta\alpha^n_{y+1}/\Delta\alpha^g_{y+1}$ is the change in net alphas/gross alphas (%) from the manager's tenure year y to $y+1$. $\mathbb{1}^{senior}_y$ is a dummy variable that is equal to one if the fund manager has any new senior colleague in the manager's tenure year y, and zero otherwise. $D_{j,k,y}$ is the standardized experience difference between the fund manager and the manager's most senior new colleague. $Size_y$ is the standardized total assets under management of all funds managed by the fund manager in the tenure year y defined by Eq. (14); $Tenure_y$ is the standardized total number of years since the fund manager starts the career in the tenure year y. The sample period is from January 1962 to December 2020. Manager and time-fixed effects are included in all regression specifications. t-statistics clustered by manager × time are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	$\Delta\alpha^n_{y+1}$		$\Delta\alpha^g_{y+1}$	
$\mathbb{1}^{senior}_y$	-0.455***		-0.351**	
	(-2.81)		(-2.18)	
$D_{j,k,y}$		0.039		0.012
		(0.31)		(0.09)
$Size_y$	-0.071	0.126	-0.071	0.124
	(-0.96)	(0.92)	(-0.97)	(0.90)
$Tenure_y$	11.100	-4.058	12.053*	2.909
	(1.57)	(-0.36)	(1.71)	(0.26)
Observations	82,877	7,785	82,857	7,768
R-squared	0.093	0.338	0.093	0.336
Manager FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES

past net alphas in attracting fund flows. The first column shows that the effect of having any new senior colleague on the fund flows is about 1.7 times (=91.660/52.924) the effect of a one-standard-deviation increase in net alphas.

I also find that the change in fees is positively related to the senior colleague dummy, as shown in the third column of Table IV. It indicates that having new senior colleagues makes fund managers have the edge to raise fees. The result of higher fund flows and higher fees points to the higher capital raising ability of fund managers. This evidence is consistent with the model of Gennaioli et al. (2015), which shows that investors' trust in fund managers allow managers to charge high fees. The final column shows that the increase in fees is negatively related to the most senior colleague's experience, implying that having the most senior colleagues is more likely to lower the increase in fees.

In sum, the results suggest that fund managers raise more capital after getting new senior

colleagues, while they do not improve their active investment skills. The more experienced the new colleague is, the higher revenues the fund manager can generate and the more fund flows to attract.

Table V: Fund Flows and Fees

This table reports the annual change in fund flows and fees. $\Delta Flow_{y+1}$ is the change in fund flows ($ million) from the manager's tenure year y to $y+1$. ΔFee_{y+1} is the change in fees (%) from the manager's tenure year y to $y+1$. $\mathbb{1}_y^{senior}$ is a dummy variable that is equal to one if the fund manager has any new senior colleague in the manager's tenure year y, and zero otherwise. $D_{j,k,y}$ is the standardized experience difference between the fund manager and the manager's most senior new colleague. $NetAlpha_y$ is the standardized average net alpha of all funds managed by the fund manager in year y defined by Eq. (15); $Size_y$ is the standardized total assets under management of all funds managed by the fund manager in the tenure year y defined by Eq. (14); $Tenure_y$ is the standardized total number of years since the fund manager starts the career in the tenure year y. The sample period is from January 1962 to December 2020. Manager and time-fixed effects are included in all regression specifications. t-statistics clustered by manager × time are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	$\Delta Flow_{y+1}$		ΔFee_{y+1}	
$\mathbb{1}_y^{senior}$	91.660**		0.106***	
	(2.69)		(17.94)	
$D_{j,k,y}$		90.524*		-0.024***
		(2.00)		(-3.45)
$NetAlpha_y$	52.924***	17.041	0.006***	0.012
	(3.24)	(0.43)	(3.84)	(1.24)
$Size_y$	-501.370**	-1,420.774***	-0.001	-0.004
	(-2.64)	(-4.79)	(-0.47)	(-0.47)
$Tenure_y$	2,841.386**	6,615.350	0.890***	6.812***
	(2.41)	(1.00)	(3.84)	(7.70)
Observations	82,659	7,754	78,968	7,744
R-squared	0.184	0.374	0.146	0.354
Manager FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES

VII. Learning Outcomes Conditional on Fund Characteristics

This section investigates how the learning to raise capital is related to the characteristics of mutual funds and fund families. I provide further evidence on the increased capital raising ability that is conditional on some fund characteristics.

I first add an interaction term between the senior colleague dummy and AUM (net alpha) into the main model specification discussed in Section VI. The literature on mutual funds documents a negative relationship between fund performance and AUM (Chen et al. (2004); Pollet and Wilson (2008); Pástor et al. (2015)). I add an interaction term of AUM because it is possible that fund managers managing larger funds are less likely to attract flows due to underperformance. Smaller size fund managers, in contrast, are easier to raise capital due to possibly higher performance. Moreover, managers managing small funds tend to have insufficient performance records such that these fund managers are more likely to raise capital. In addition, fund managers who manage large funds probably already have a good capital raising ability evidenced in their high AUM such that the margin to improve the capital raising ability is low.

The first column of Table VI shows that the effect of learning from senior colleagues to generate higher revenue decreases with AUM. When a fund manager manages $100 million total net assets, getting new senior colleagues makes her generate $ 0.526 million (0.726-0.0002*100) more revenues. It suggests that fund managers who manage small-size funds are more likely to learn from senior colleagues to generate higher revenues.

I then add an interaction term of net alphas given that mutual fund flows are positively related to past performance (Sirri and Tufano (1998); Lynch and Musto (2003); Choi et al. (2016)). It is crucial to understand which fund managers are more likely to learn to raise capital - managers with higher or lower past net alphas. The second column of Table VI shows that the effect of learning from senior colleagues to generate higher revenue ($\Delta Revenue_{y+1}$) decreases with the past net alpha. When a fund manager delivers -1% net alpha last year,

getting new senior colleagues makes her generate $ 0.77 million (0.56-21.02*(-1%)) more revenues. It indicates that fund managers who deliver poor past performance are more likely to learn from senior colleagues to generate revenues.

Table VI: Conditional on AUM and Net Alpha

This table reports the annual change in revenues. $\Delta Revenue_{y+1}$ is the change in revenues ($ million) from the manager's tenure year y to $y+1$. $\Delta ValueAdded_{y+1}$ is the change in value added ($ million) from the manager's tenure year y to $y+1$. Value added is also known as the revenue from the active investment skill. $\mathbb{1}_y^{senior}$ is a dummy variable that is equal to one if the fund manager has any new senior colleague in the manager's tenure year y, and zero otherwise. $Size_y$ is the total assets under management of all funds managed by the fund manager in the tenure year y defined by Eq. (14); $NetAlpha_y$ is the standardized average net alpha of all funds managed by the fund manager in year y defined by Eq. (15); $\mathbb{1}_y^{senior}$ x $Size_y$ is an interaction term between $\mathbb{1}_y^{senior}$ and $Size_y$. $\mathbb{1}_y^{senior}$ x $NetAlpha_y$ is an interaction term between $\mathbb{1}_y^{senior}$ and $NetAlpha_y$. The sample period is from January 1962 to December 2020. Manager and time-fixed effects are included in all regression specifications. t-statistics are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	$\Delta Revenue_{y+1}$	
$\mathbb{1}_y^{senior}$	0.728***	0.560***
	(6.63)	(5.39)
$Size_y$	-0.001***	
	(-47.33)	
$\mathbb{1}_y^{senior}$ x $Size_y$	-0.0002***	
	(-5.06)	
$NetAlpha_y$		25.585***
		(8.68)
$\mathbb{1}_y^{senior}$ x $NetAlpha_y$		-21.020***
		(-3.78)
Observations	84,433	84,433
R-squared	0.163	0.163
Controls	YES	YES
Manager FE	YES	YES
Time FE	YES	YES

Some studies show that investors' preferences for product differentiation determine the size of a fund.[15] I add an interaction term between the senior colleague dummy and the number of funds in the fund family, which is the proxy for product differentiation. If a fund family has a large number of funds under management, it is more likely that a fund manager would direct some investors to other types of funds to cater to different investors' tastes. The

[15]See, for example, Hortaçsu and Syverson (2004); Kostovetsky and Warner (2020).

hypothesis is that the new senior colleague plays a more important role in a fund family with a large number of funds. The first column of Table VII shows that the effect of learning from new senior colleagues to generate higher revenue ($\Delta Revenue_{y+1}$) increases with the number of funds in the fund family. This evidence suggests that senior colleagues are more likely to share client connections with junior managers when the fund family has more diversified products. One could argue that larger fund families have more funds under management, so the interpretation might not be related to product differentiation. The second column shows that there is no interaction between the senior colleague dummy and the fund family size, suggesting that fund family size is not interacted with senior colleague dummy in generating higher revenues.

Table VII: Conditional on Fund Family Size and Number of Funds

This table reports the annual change in revenues. $\Delta Revenue_{y+1}$ is the change in revenues ($ million) from the manager's tenure year y to $y+1$. $\Delta ValueAdded_{y+1}$ is the change in value added ($ million) from the manager's tenure year y to $y+1$. Value added is also known as the revenue from the active investment skill. $\mathbb{1}_y^{senior}$ is a dummy variable that is equal to one if the fund manager has any new senior colleague in the manager's tenure year y, and zero otherwise. The sample period is from January 1962 to December 2020. Manager and time-fixed effects are included in all regression specifications. t-statistics are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	$\Delta Revenue_{y+1}$	
$\mathbb{1}_y^{senior}$	0.290**	0.513***
	(2.14)	(4.64)
$\#FundsinFamily_y$	-0.005	
	(-1.60)	
$\mathbb{1}_y^{senior}$ x $\#FundsinFamily_y$	0.009***	
	(2.99)	
$FamilySize_y$		0.000***
		(5.84)
$\mathbb{1}_y^{senior}$ x $FamilySize_y$		0.000
		(0.95)
Observations	84,433	84,433
R-squared	0.163	0.164
Controls	YES	YES
Manager FE	YES	YES
Time FE	YES	YES

Finally, I visually show how revenues are related to the senior colleague dummy to better understand which fund managers learn the most. Figure III depicts the change in revenues and value added sorted on AUM into five quintiles. The left panel shows that fund managers with new senior colleagues generate higher revenues in the next year in every AUM quintile. In addition, the bottom quintile (smallest AUM) has the largest gap between managers with and without senior colleagues. One possibility is that the capital is not sufficient for fund managers with the lowest AUM. There are still positive investment opportunities for investors to compete (net alpha is positive). Investors can know these investment opportunities when the senior colleagues introduce the junior manager to investors. Fund managers may also have better networking skills to attract fund flows quicker. Another possibility is that some rational investors have insufficient skill updates for fund managers who manage small-size funds. It is easier for senior colleagues to direct investors to invest in these small AUM funds because investors do not have sufficient performance records to update their active investment skills. The right panel of Figure III depicts the change in value added. There is a large spread for value added such that no pattern can be observed.

Figure III: Total Revenue and Value Added - Sorted on AUM

This figure plots the change in total revenue and value added for the fund managers who have, and do not have, new senior colleagues after getting senior colleagues, sorted on AUM. The gold bars represent 95% confidence intervals. The sample period is from January 1962 to December 2020.

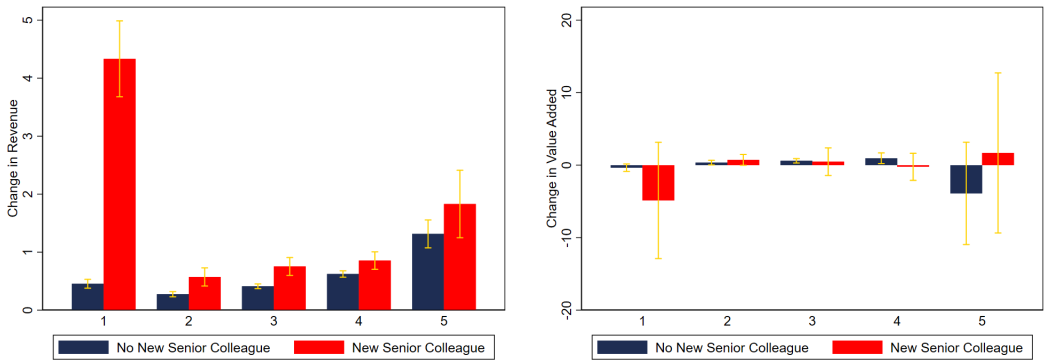
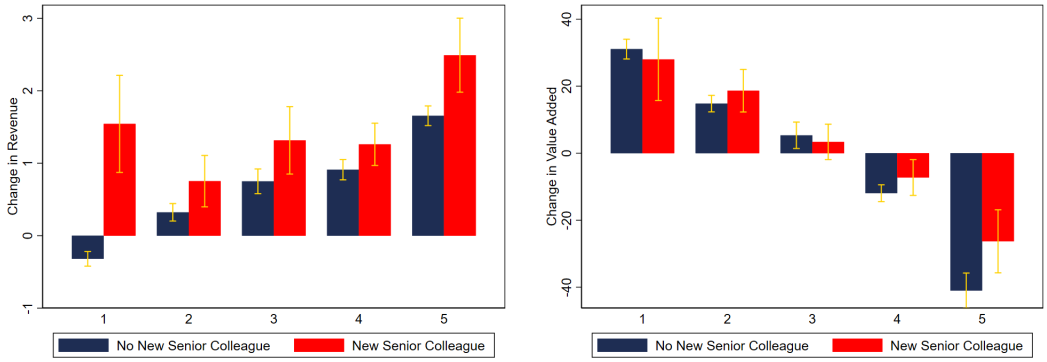


Figure IV depicts the change in revenues and value added sorted on past net alpha into five quintiles. The left panel shows that, in all five quintiles, fund managers with new

Figure IV: Revenue and Value Added - Sorted on Past Alpha

This figure plots the change in revenues and value added for the fund managers who have, and do not have, new senior colleagues after getting senior colleagues, sorted on past alpha. The gold bars represent 95% confidence intervals. The sample period is from January 1962 to December 2020.



senior colleagues generate a higher revenue than managers without new senior colleagues. In particular, the bottom quintile (smallest past net alpha) has the largest gap. Revenues decrease for the managers who deliver the poorest past net alpha and do not have any new senior colleague. This is consistent with the empirical evidence that the poor past net alpha causes large fund outflows and thus lowers revenues (Sirri and Tufano (1998); Lynch and Musto (2003)). In contrast, revenues increase substantially for managers with the poorest net alpha and have new senior colleagues. This evidence suggests that fund managers may improve their skills in maintaining clients or attracting new clients. Moreover, the increase in revenue is higher for fund managers who deliver higher net alpha, which is consistent with the literature that delivering high alpha is an incentive for fund managers.

The right panel of Figure III shows the change in the value added. In the top quintile, the fund manager has a decreased value added. When the net alpha was very large last year, it was difficult to generate an even higher alpha, so the change in value added decreases in the top quintile. In five deciles, we cannot observe a significant difference in the change in value added between fund managers with and without new senior colleagues.

VIII. Additional Results and Robustness Checks

VIII.A. New Junior Colleagues

I investigate the outcomes when all new colleagues are more junior than the fund manager to further understand how the seniority is related to the capital raising ability. A fund manager sometimes has multiple new colleagues, some are more senior and some are more junior. The main analysis uses $\mathbb{1}^{senior}$, which is equal to one when *any* new colleague is more senior. In order to study the effect of junior colleagues, we need to construct a dummy variable that *all* new colleagues are more junior: $\mathbb{1}^{alljunior}$ is a dummy variable that is equal to one if the fund manager has any new colleague and *all* colleagues are more junior, and zero otherwise.

Table VIII shows that when a fund manager has new colleagues who are all junior, the manager loses revenues. It is surprising because learning cannot be negative in principle. The second column shows that increased fund flows are lower when fund managers have new junior colleagues. One possibility is that senior fund managers share client connections with junior colleagues at the expense of their own interests. Sharing clients to junior colleagues is possibly in the interest of the fund firms to maximized firm revenues (e.g., Berk et al. (2017); Agarwal et al. (2018)). This result suggests that fund flows have mobility and can be influenced by fund managers. The third column shows that value added does not differ significantly, suggesting that the active investment skill also cannot be learned from junior colleagues.

Table VIII: Revenues and Value Added - New Junior Colleagues

This table reports the annual change in revenues and value added. $\Delta Revenue_{y+1}$ is the change in revenues (\$ million) from the manager's tenure year y to $y+1$. $\Delta Flow_{y+1}$ is the change in fund flows (\$ million) from the manager's tenure year y to $y+1$. $\Delta ValueAdded_{y+1}$ is the change in value added (\$ million) from the manager's tenure year y to $y+1$. Value added is also known as the revenue from the active investment skill. $\mathbb{1}_y^{alljunior}$ is a dummy variable that is equal to one if the fund manager has any new colleague and all colleagues are more junior in the manager's tenure year y, and zero otherwise. $NetAlpha_y$ is the standardized average net alpha of all funds managed by the fund manager in year y defined by Eq. (15); $Size_y$ is the standardized total assets under management of all funds managed by the fund manager in the tenure year y defined by Eq. (14); $Tenure_y$ is the standardized total number of years since the fund manager starts the career in the tenure year y. The sample period is from January 1962 to December 2020. Manager and time-fixed effects are included in all regression specifications. t-statistics clustered by manager × time are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

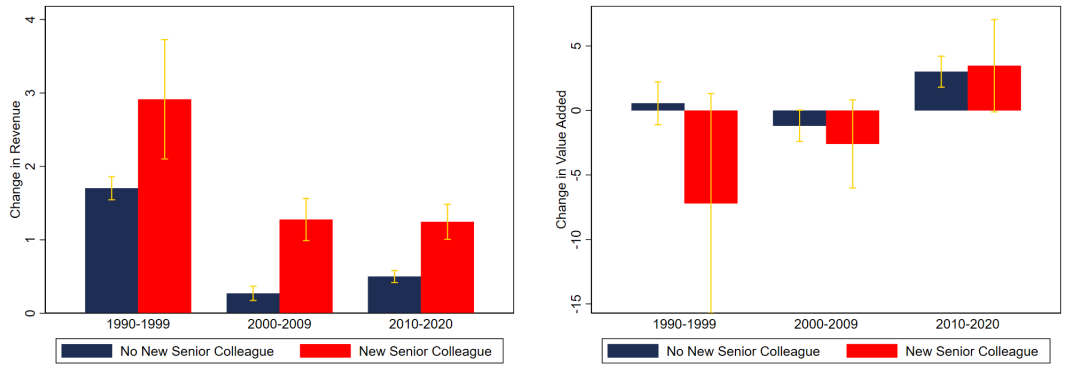
	$\Delta TotalRevenue_{y+1}$	$\Delta Flow_{y+1}$	$\Delta ValueAdded_{y+1}$
$\mathbb{1}_y^{alljunior}$	-0.519***	-177.895***	-1.343
	(-4.13)	(-3.46)	(-0.41)
$NetAlpha_y$	0.591***	54.770***	-31.879***
	(7.50)	(3.17)	(-9.39)
$Size_y$	-2.173***	-467.799**	-30.257
	(-3.36)	(-2.25)	(-1.66)
$Tenure_y$	3.717	2,751.059**	-29.109
	(0.60)	(2.47)	(-0.43)
Observations	74,580	72,611	72,711
R-squared	0.185	0.195	0.065
Manager FE	YES	YES	YES
Time FE	YES	YES	YES

VIII.B. Different Periods

I examine the learning from senior colleagues during different periods. As in Figure I, there is an increasing trend for decentralized investment from 1990 to 2010, and the numbers of funds and managers are stable from 2010 to 2020. One could argue that the learning outcomes should be different during these periods. Figure IV depicts the change in revenues and value added for 10-year subperiods from 1990 to 2020 for fund managers with and without new senior colleagues.[16] Fund managers learn more during the rising period from 1990 to 1999. The gap between managers with and without senior colleagues decreases in 2010 to 2020. Even so, the difference is economically and statistically significant. In contrast, the change in value added has no significant difference for fund managers with and without new senior colleagues.

Figure V: Change in Revenue and Value Added

This figure plots the change in revenue and value added for the fund managers who have and do not have new senior colleagues during different time periods. The gold bars represent 95% confidence intervals. The sample period is from January 1962 to December 2020.



[16]The sample size from 1960 to 1990 is too small (232 observations), so I exclude this sample period.

IX. Conclusion

What do fund managers learn from colleagues? This paper addresses this question by designing a methodology that examines a manager's other funds and proposes a theory to interpret the specific skills a manager acquires. The model features the capital raising ability, in which the main assumption follows the empirical findings that there is a large cross-sectional dispersion in net alphas and fees of mutual funds (e.g., Carhart (1997); Cooper et al. (2021)). The results reveal that fund managers learn the capital raising ability, while do not learn the active investment skill.

This paper highlights that fund managers play an important role in raising capital and experience matters, though the literature primarily focuses on the role of financial advisors and brokers in raising capital (e.g., Bergstresser et al. (2009)) and fund managers' role in investing actively. The capital raising ability of fund manager is one important reason for why underperformed fund managers exist. This paper does not imply what specific capital raising skills fund managers learn (e.g., client maintaining skills), which is left for future research. Moreover, I focus on the experience difference among fund managers. The identification strategy opens doors for any learning possibility, such as learning from colleagues with different backgrounds and characteristics.

Appendix A: Proofs

A.1. No Active Investment Skill

For a fund manager who does not have the active investment skill, the objective is to maximize the revenue from the capital raising ability V^C with respect to the total assets under management q as

$$\frac{dV^C}{dq} = c - 2kq^* = 0 \Rightarrow q^* = \frac{c}{2k}. \tag{17}$$

Substituting the optimal q^* into Eq. (9) gives the maximized revenues the fund manager earns from raising capital:

$$V^{C*} = q^*(c - kq^*) = \frac{c}{2k}(c - k\frac{c}{2k}) = \frac{c^2}{4k}, \tag{18}$$

and substituting q^* into Eq. (9) gives the net alpha in equilibrium:

$$\alpha^{n*} = -\frac{c}{2}. \tag{19}$$

This equation shows that a fund manager with higher skill in raising capital (higher c) has a lower equilibrium net alpha α^{n*}.

A.2. Capitals for the Active Investment is Abundant

This section derives the equilibrium AUM, gross alpha, and revenue of the active investment when the fund manager can raise enough capital for the active investment (i.e., $q \geq q^{A*}$) as discussed in Berk and Green (2004). Assume that the fund manager's objective is to maximize the revenue of the active investment V^A (called value added) with respect to the size of the active investment q^A. The optimal amount of money manager j chooses to actively manage is given by

$$\frac{dV^A}{dq} = a - 2bq^{A*} = 0 \Rightarrow q^{A*} = \frac{a}{2b}. \tag{20}$$

Substituting the optimal actively managed q^{A*} into Eq. (11) gives the active investment skill of the fund manager in equilibrium:

$$V^{A*} = q^*(a - bq^*) = \frac{a}{2b}(a - b\frac{a}{2b}) = \frac{a^2}{4b}, \tag{21}$$

and substituting q^{A*} into Eq. (10) gives the gross alpha generated by the active investment in equilibrium:

$$\alpha^{g^A*} = a - b(\frac{a}{2b}) = \frac{a}{2}. \tag{22}$$

Here I start to develop the hypotheses for total revenues, revenues from the active investment, and revenues from capital raising. Maximized revenues from the active investment is $V^{A*} = \frac{a^2}{4b}$, as in Eq. (21). Maximized revenue from raising capital is $V^{C*} = \frac{c^2}{4k}$, as in Eq. (18). So the total revenue is:

$$V^* = V^{A*} + V^{C*} = \frac{a^2}{4b} + \frac{c^2}{4k}. \tag{23}$$

Proposition 1. *If $q^* \geq q^{A*}$, V^* increases with a or c; V^{A*} increases only with a; V^{C*} increases only with c.*

The proposition shows that when the capital is abundant for the active investment, the total revenue of a fund manager increases with both the active investment skill and the capital raising ability; the revenue from the active investment (value added) only increases with the active investment skill.

The equilibrium net alpha is $\alpha^{n*} = -\frac{c}{2}$, as in Eq. (22).

Proposition 2. *If $q^* \geq q^{A*}$, α^{n*} decreases with c, whereas α^{n*} does not decrease with a.*

The proposition shows that when the capital is abundant for the active investment, a fund manager's net alpha decreases with the raising capital ability, but the increased active investment skill does not affect the net alpha.

The equilibrium gross alpha is the value added from the active investment divided by the total assets under management:

$$\alpha^{g*} = \frac{V^{A*}}{q^*} = \frac{a^2 k}{2bc}, \tag{24}$$

Proposition 3. *If $q^* \geq q^{A*}$, α^{g*} increases with a, and decreases with c.*

The proposition shows that when the capital is abundant for the active investment, a fund manager's gross alpha increases with the active investment skill and decreases with the capital raising ability.

Berk and Green (2004) and Berk and van Binsbergen (2015) suggest that it is optimal for the fund manager to actively invest q^{A*} and index the excess capital. The choices of q^{A*} and q^* are independent when the capital is abundant (i.e., $q^* \geq q^{A*}$). Substituting Eq. (17) and (20) into $q^* \geq q^{A*}$ gives

$$q^* = \frac{c}{2k} \geq \frac{a}{2b} = q^{A*}. \tag{25}$$

Proposition 4. *If $q^* \geq q^{A*}$, q^* increases with c, whereas q^* does not increase with a.*

The proposition shows that when the capital is abundant for the active investment, the equilibrium AUM increases with the raising capital ability but does not increase with the active investment skill.

Finally, the equilibrium fee is equal to the difference between the equilibrium gross alpha in Eq. (24) and the net alpha α^{n*} in Eq. (22):

$$f^* = \alpha^{g*} - \alpha^{n*} = \frac{a^2 k}{2bc} + \frac{c}{2}, \tag{26}$$

Proposition 5. *If $q^* \geq q^{A*}$, f^* increases with a, and may increase or decrease with c.*

The proposition shows that when the capital is abundant for the active investment, the fee increases with the active investment skill, while it is unclear whether the fee increases or decreases with the capital raising ability.

A.3. Capitals for the Active Investment is Constrained

If the total amount of capital raised by the fund manager is constrained (i.e., $q < q^{A*}$), the total revenue from both the active investment and the capital raising is:

$$V = V^A + V^C = (a + c)q - (b + k)q^2. \tag{27}$$

For a revenue maximizing fund manager, maximizing the total revenue with respect to the total assets under management q gives:

$$\frac{dV}{dq} = a + c - 2bq^* - 2kq^* = 0 \Rightarrow q^* = \frac{a + c}{2(b + k)}. \tag{28}$$

Eq. (28) shows that when the capital is not abundant for the active investment, the optimal q^* increases with both the active investment skill a and the capital raising ability c.

Substituting Eq. (28) into Eq. (9) and Eq. (11) gives the revenues from the active investment and the capital raising as

$$V^{A*} = \frac{a^2b + 2a^2k + 2ack - bc^2}{4(b + k)^2}, \tag{29}$$

and

$$V^{C*} = \frac{2bc^2 + c^2k + 2abc - a^2k}{4(b + k)^2}. \tag{30}$$

Eq. (29) and (30) show that when the capital is not abundant for the active investment, the total revenues of a fund manager increases with both the active investment skill and the capital raising ability; the revenues from the active investment (value added) increases with the active investment skill.

Substituting Eq. (28) into Eq. (7) gives the equilibrium net alpha as

$$\alpha^n = -c + kq^* = -c + \frac{k(a + c)}{2(b + k)}. \tag{31}$$

Eq. (31) shows that when the capital is not abundant for the active investment, the net alpha increases with the active investment skill a at a speed of $\frac{k}{2(b+k)}$ and decreases with the capital raising ability c at a speed of $\frac{2b+k}{2(b+k)}$.

The equilibrium gross alpha of the fund is:

$$\alpha^{g*} = \frac{V^{A*}}{q^*} = a - bq^* = a - \frac{b(a+c)}{2(b+k)}, \tag{32}$$

Eq. (32) shows that when the capital is not abundant for the active investment, the gross alpha increases with the skill of active investment a at a speed of $\frac{b+2k}{2(b+k)}$, and decreases with the skill of raising cheap capital c at a speed of $\frac{b}{2(b+k)}$.

The equilibrium fee is equal to the maximized total revenues in Eq. (27) divided by the optimal AUM in Eq. (28) as:

$$f^* = \frac{V^*}{q^*} = \frac{a+c}{2}. \tag{33}$$

Eq. (33) shows that when the capital is not abundant for the active investment, the equilibrium fee increases with both the active investment skill a and the capital raising ability c.

A summary of hypotheses when there is constrained capital and non-constrained capital is shown in Table A1.

Table A1: Summary of Hypotheses - Constrained and Non-constrained Capital

This table reports the summary of hypotheses to distinguish between the capital raising ability and the active investment skill.

	Learn to Increase			
	Capital Raising Ability		Active Investment Skill	
	Not Constrained	Constrained	Not Constrained	Constrained
Revenue (Total)	+	+	+	+
Revenue from Active Investment	no effect	+ / -	+	+
Net Alpha	-	-	no effect	+
Gross Alpha	-	-	+	+
Fund Flow	+	+	no effect	+
Fee	+ / -	+	+	+

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