The Effects of Misperceived Managerial Skill: Evidence from Chinese Mutual Funds

第 3 回「若手研究者の金融セミナー」

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Motivation

- **<u>Whether mutual fund fees are too high</u>** has long been controversial among researchers, the media, and policymakers.

  - Mutual fund fees represent how much it costs to operate mutual funds.

  - 0.47% → $47 for every $10000 invested. Fees matter!

  - Investors need to know what they're paying for the funds.

Motivation

- Market power should be commensurate with the value it creates for investors

  - The return is often separated into its alpha and beta.

  - In theory, investors should focus on alpha when assessing a fund manager's skill (Pástor and Stambaugh, 2002).

  - **Skilled managers** could charge **higher market power**.

Motivation

- Many investors confuse factor-related returns with managerial skills (Song, 2020).
- Funds with higher factor-related returns can exploit investors' misperceptions and obtain higher market power (Li and Qiu, 2014).
- Inability to directly calculate market power → The relationship between investors' misperception and market power has not been sufficiently studied empirically.

Research Question

- Do **misperceptions of managerial skills** impact the **market power** of funds in emerging markets such as China?

- What are the welfare costs of misperceptions?

Research Question

Why should we care?

- In 2017

  - 2860 equity funds competed in the Chinese market.

  - The average fee of active funds was **1.2%**. The average fee for U.S. active funds was **0.8%**.

Research Question

Why should we care?

- There is scare evidence in emerging markets such as China.

- If investors are making mistakes, their welfare will be reduced.

  → Need policy about information disclosure or financial literacy.

Main Results

What do we do? What do we learn?

- Do **misperceptions of managerial skills** impact the **market power** of funds in emerging markets such as China?

  - An estimation method from the IO literature was used to calculate the market power of funds.

  - Funds with higher factor-related returns also obtain higher market powers than they could otherwise.

Main Results

What do we do? What do we learn?

- What are the welfare costs of misperceptions?

  - Using the estimated model, we simulate how investors' welfare would change under the hypothetical level of misperception.

  - Only focusing on 4-factor alpha → Welfare improvement for each investor ranging from $203 to $674 per year.

Data

- We focus on active Chinese domestic mutual funds (2011 ~ 2021).

  - Include general stock funds and equity-oriented hybrid funds.

  - Exclude index funds and ETFs

  - Exclude funds lacking available monthly returns data for at least three years.

Data

Factor-related returns

- For each fund/year, we regress the monthly gross excess return of mutual fund *j* on monthly four-factor model:

$$R_{j,m} - R_f = \alpha_j^{4F} + m_j MKT_m + s_j SMB_m + h_j HML_m + u_j UMD_m + \varepsilon_{jm}$$

- We then calculate alpha and factor-related returns

$$\hat{\alpha}_j^{4F} = (R_{j,m} - R_f) - [\hat{m}_j MKT_m + \hat{s}_j SMB_m + \hat{h}_j HML_m + \hat{u}_j UMD_m]$$

4 factor related returns

Measuring Market Power

Demand estimation

- To estimate the market power, we apply the discrete choice model.

- Investor i's utility from investing fund j at year t is:

$$u_{i,j,t} = -\theta_{1,i} f_{j,t} + \theta_{2,i} R_{j,t-1} + \beta X_{j,t} + \xi_{j,t} + \varepsilon_{i,j,t}$$

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Fees (expense ratio)

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Past returns

Measuring Market Power

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Observed characteristics of fund j

Measuring Market Power

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The fund-specific unobserved characteristics

Measuring Market Power

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Idiosyncratic utility shocks

Measuring Market Power

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The heterogeneous coefficients → Investors have different tastes

Measuring Market Power

Demand estimation

- By assuming $\varepsilon_{i,j,t}$ following the mean-zero i.i.d. Type 1 extreme value distribution, we have the predicted market share $s_{j,t}^{m}$:

$$s_{j,t}^{m} = \int_{i} \frac{exp(-\beta_{1,i} f_{j,t} + \beta_{2,i} R_{j,t-1} + \beta X_{j,t} + \xi_{j,t})}{\sum_{k \in J} exp(-\beta_{1,i} f_{k,t} + \beta_{2,i} R_{k,t-1} + \beta X_{k,t} + \xi_{k,t})} dF(\nu_i)$$

- Estimate the parameter by minimizing the distance between observed and predicted market shares.

  - Observed market shares = TNA/(The aggregate TNA of the entire market)

Measuring Market Power

Supply Models

- Consider the profits of fund family F, which for year t controls several funds $J_{F,t}$ and sets expense ratios $f_{j,t}$.

$$max_{f_{j,t}} : j \in J_{F,t} \sum_{j \in J_{F,t}} s_{j,t} M_t \cdot (f_{j,t} - c_{j,t})$$

Marginal cost

- Assuming fund families play a Bertrand-Nash pricing game.

- They aim to maximize the profits.

- M is the size of the market.

Measuring Market Power

Supply Models

- For year t, the matrix form of the first-order conditions is

$$\mathbf{f} - \mathbf{c} = \Omega^{-1}\mathbf{S}, \text{ where } \Omega \equiv -H \odot \frac{\partial \mathbf{s}}{\partial \mathbf{p}}$$

From demand estimation

- Given that we observe the expense ratio and estimated demand, we can recover the marginal costs under Bertrand-Nash behavior.

  - Obtain market power $\frac{f_{j,t} - c_{j,t}}{f_{j,t}}$ for each fund j.

Measuring Market Power

Demand estimation results

- Investors positively value alpha and factor-related returns.
- In theory, investors should focus on alpha when assessing a fund manager's skill.

	(1)	(2)	(3)
Fees - Mean	-4.406***	-1.695**	-1.824**
	(1.020)	(0.887)	(0.623)
Fees - S.D.	1.420***	2.940***	2.267***
	(0.396)	(0.549)	(0.475)
Past return - Mean	0.944***	-	-
	(0.072)	-	-
Past return - S.D.	0.143	-	-
	(0.612)	-	-
Alpha - Mean	-	1.211***	1.022***
	-	(0.409)	(0.433)
Alpha - S.D.	-	0.393	0.768**
	-	(0.241)	(0.274)
FRRs - Mean	-	3.203**	3.181**
	-	(1.447)	(1.319)
FRRs - S.D.	-	0.344	0.833**
	-	(0.408)	(0.229)
Volatility of return	-5.121***	-5.468***	-6.067***
	(0.098)	(0.795)	(1.046)
Fund age	0.671***	1.841***	1.059***
	(0.198)	(0.274)	(0.242)
Turnover ratio	-0.050***	-0.065	-0.006
	(0.019)	(0.190)	(0.033)
Mutual Fund FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	3,515	3,515	3,515

Main Results

Market power

- Funds with higher factor-related returns tend to have higher market powers.
- Factor-related returns are easily obtained at low fees (Index funds, ETFs).
- Investors should not be paying high fees for factor-related returns.

	$\frac{f_{j,t}-c_{j,t}}{f_{j,t}}$	
	(1)	(2)
Alpha	0.972***	1.008***
	(0.072)	(0.071)
FRRs	0.987***	0.971***
	(0.090)	(0.010)
Institution ratio	-0.005**	-0.005**
	(0.002)	(0.002)
Fund age	0.378	0.375
	(0.232)	(0.232)
Volatility of return	2.172**	2.728**
	(0.796)	(0.938)
Turnover ratio	-0.052***	-0.051***
	(0.006)	(0.005)
Size	0.176***	0.184***
	(0.023)	(0.023)
TDRFL	0.058***	0.010
	(0.015)	(0.007)
Mutual Fund FE	Yes	Yes
Year FE	Yes	Yes
Within R-sq.	0.029	0.027
Observations	3,382	3,382

Welfare Analysis

Supply Models

- We assume that investors only focus on the alpha.
- We simulate the equilibrium fees under alternative scenarios.
- Using counterfactual fees, we compute counterfactual investor surplus.

Welfare Analysis

Supply Models

- We use the compensating variation to measure the change in investor surplus.

$$CV_t = \int [CS_{i,t}^{Counterfactual} - CS_{i,t}] dF(\nu)$$

- The percentage gain in investor surplus for each yuan invested in the year t.

- A positive CV_t implies the consumer is better off.

Main Results

Welfare analysis

- CV_t: the percentage gain in investor surplus for each yuan invested in the year t.

  - When only focusing on 4-factor alpha, investor surplus improved by 5.43% to 18.05%.

	CV (%)	CV (Yuan)	CV (%)	CV (Yuan)
	4-factor	4-fator	5-factor	5-factor
	(1)	(2)	(3)	(4)
2011	7.69	2045.16	8.08	2148.88
2012	6.16	1639.52	6.50	1727.80
2013	5.43	1445.28	5.75	1528.81
2014	7.93	2109.31	8.31	2210.88
2015	9.97	2651.11	10.49	2791.07
2016	11.49	3056.80	12.08	3212.32
2017	8.95	2381.10	9.42	2505.09
2018	12.95	3443.65	13.58	3611.08
2019	18.05	4800.39	18.94	5036.12
2020	14.26	3791.66	14.98	3982.61
2021	16.39	4359.45	17.19	4571.15

Main Results

Welfare analysis

- The investor surplus per capita in a year *t*

  $=CV_t$*Average per capita investment

- Female fund investors' average per capita investment was 26,595 yuan (“Insights into Profitability of Publicly Offered Equity Funds Investors Report”).
- In monetary terms, the welfare effect ranges from 1445 yuan to 4800 yuan (equivalent to US$ 203 to US$674).

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2021	16.39	4359.45	17.19	4571.15

Conclusion

- We find that Chinese active mutual fund investors care about the FRRs of the funds.

  - The misperceived managerial skills increase the fund's market power.

  - The misperceived managerial skills decrease investors' welfare.

- Policy implications:

  - Information disclosure and financial education can improve investors' welfare.

Appendix

Demand Models

Estimation

- We estimate the model using the GMM similarly to the seminal work by BLP.
- We apply differentiations IVs for expense ratio (Gandhi and Houde, 2019).

  - Measure where fund j is located in the characteristics space.

  - Use the summary measure of the distance from all other alternatives in a market as instrument.

- We consider the following characteristics.

  - Fund age; Return volatility; Turnover ratio.

Welfare Analysis

- We simulate the equilibrium vector of fees under alternative scenarios, assuming that investors only focus on the alpha.

- The counterfactual equilibrium fees are obtained by solving for the fees $\mathbf{f}^*$ that satisfy the following equation:

$$\mathbf{f}^* - \mathbf{c} = \Omega^{-1}\mathbf{S}(\mathbf{f}^*, frr_{No})$$

Welfare Analysis

- In the random coefficient model, the investor surplus can be written as

$$CS_{i,t} = \frac{ln(\sum_{j=1}^{J} exp(\delta_{j,t} + \mu_{i,j,t}))}{\theta_{1,i}}$$

- The investor surplus under the counterfactual equilibrium can be written as

$$CS_{i,t}^{Counterfactual} = \frac{ln(\sum_{j=1}^{J} exp(\delta_{j,t}^{Counterfactual} + \mu_{i,j,t}^{Counterfactual}))}{\theta_{1,i}}$$

Performance Persistence of Funds

	$FRRs_{j,t}$		$Alpha_{j,t}$	
	(1)	(2)	(3)	(4)
$FRRs_{j,t-1}$	-0.003	0.046	0.058	-0.072**
	(0.152)	(0.104)	(0.043)	(0.028)
$Alpha_{j,t-1}$	0.057	0.070	0.073**	0.055**
	(0.091)	(0.078)	(0.035)	(0.026)
Controls	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Serial Correlation (P-value)	0.002	0.006	0.000	0.000
Hansen Test (P-value)	0.341	0.091	0.203	0.074
Observations	2,322	2,322	2,322	2,322

Demand estimation results

- Investors negatively value fees.
- Investors positively value past returns.

	(1)	(2)	(3)
Fees - Mean	-4.406***	-1.695**	-1.824**
	(1.020)	(0.887)	(0.623)
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Mutual Fund FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
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Demand elasticities

- Investors tolerate the higher fees charged by the funds with higher factor-related returns.

	Demand elasticity to fees	
	(1)	(2)
Alpha	-1.021***	-1.014***
	(0.050)	(0.048)
FRRs	-0.902***	-0.912***
	(0.052)	(0.053)
Institution ratio	0.004***	0.004**
	(0.000)	(0.000)
Fund age	-0.186***	-0.185***
	(0.079)	(0.079)
Volatility of return	-0.733*	-0.691
	(0.416)	(0.425)
Turnover ratio	0.067***	0.066***
	(0.003)	(0.003)
Size	-0.111***	-0.1115***
	(0.010)	(0.010)
TDRFL	-0.018**	-0.008**
	(0.007)	(0.004)
Mutual Fund FE	Yes	Yes
Year FE	Yes	Yes
Within R-sq.	0.500	0.027
Observations	3,382	3,382

Welfare Analysis

- Funds with higher FRRs experience more significant decreases in counterfactual equilibrium fees.

	$f^*_{j,t} - f_{j,t}$	
	(1)	(2)
Alpha	-0.139***	-0.101***
	(0.033)	(0.031)
FRRs	0.380***	0.365***
	(0.042)	(0.041)
Institution ratio	0.000	0.000
	(0.000)	(0.000)
Fund age	0.003	0.003
	(0.009)	(0.009)
Volatility of return	0.064*	0.064
	(0.035)	(0.042)
Turnover ratio	-0.002***	-0.002***
	(0.000)	(0.000)
Size	0.003**	0.003**
	(0.001)	(0.001)
TDRFL	0.001*	0.000
	(0.001)	(0.000)
Mutual Fund FE	Yes	Yes
Year FE	Yes	Yes
Within R-sq.	0.018	0.017
Observations	3,381	3,381