Is There Too Much Benchmarking in Asset Management?

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Benchmarking is Prevalent in Asset Management

- Money managed against leading benchmarks:

S&P 500	$\approx$ \$10 trillion
FTSE-Russell (multiple indices)	$\approx$ \$8.6 trillion
MSCI All Country World Index	$\approx$ \$3.2 trillion
MSCI EAFE	$\approx$ \$1.9 trillion
CRSP	$\approx$ \$1.3 trillion

This Paper – General Equilibrium Effect of Contracts in AM

- Proposes a theory of asset management in which benchmarking arises endogenously
  - Central friction: moral hazard
- In general equilibrium, fund managers' contracts generate "crowded trades"
- Fund investors do not internalize the effects of benchmarking on asset prices
  - impose an externality on each other
- Compared to a socially optimal contract:
  - **Excessive benchmarking:** The socially optimal level of benchmarking is lower
  - **Excessive cost of asset management:** The socially optimal level of costs is lower
  - Benchmark compositions also differ
- A tractable model with closed-form expressions for contracts and prices

Model

- Two periods
- N risky stocks (S), with normally distributed cash flows $\tilde{D}$. One riskfree asset.
- Investors: Direct investors (fraction λ_D), fund managers (λ_M), fund investors (λ_F)
  - Fund investors cannot observe managers' portfolio choice
- All investors have CARA utility over final wealth (compensation):

$$-E\exp(-\gamma W)$$

Value Added of Fund Managers

- Performance of direct investor's portfolio x: $R = x^\top(\tilde{D} - S)$
- Fund performance:

$$R = \underbrace{\Delta^\top x}_{\text{"alpha"}} + x^\top(\tilde{D} - S) + \epsilon \qquad \epsilon \sim N(0, \sigma_\epsilon)$$

- Interpretation of Δ:
  - Securities lending
  - Crossing trades: lowering transaction costs
  - Liquidity provision
- Fund managers incur private cost $\psi^\top x$ of managing risky assets ($\psi \geq 0$)
- Interpretation of private cost ψ: acquiring information about liquidity needs; managing sec lending; seeking opportunities to cross trades

Fund Managers

- Compensation contract:

$$w = \hat{a}R + b(R - R_{benchmark}) + c = \underbrace{(\hat{a} + b)}_{\equiv a} R - bR_{benchmark} + c$$

  - R – performance of the fund
  - $R_{benchmark} = \boldsymbol{\theta}^{\top}(\tilde{D} - S)$ – performance of benchmark
  - $\hat{a}$ – sensitivity to absolute performance
  - b – sensitivity to relative performance
  - c – independent of performance (e.g., fixed salary or based on time-0 AUM)
  - $a \equiv \hat{a} + b$ – "skin in the game"

- The contract parameters a, b, c, and θ are endogenous, chosen by the fund investors

- Evidence: Ma, Tang, and Gomez (2019)

Portfolio Choice

- Direct investors hold the standard mean-variance portfolio

$$x^D = \Sigma^{-1} \frac{\mu - S}{\gamma}$$

- Fund managers hold:

$$x^M = \Sigma^{-1} \frac{\boldsymbol{\Delta} - \frac{\boldsymbol{\psi}}{\boldsymbol{a}} + \mu - S}{a\gamma} + \frac{\boldsymbol{b\theta}}{\boldsymbol{a}}$$

- **Takeaway 1:** Managers have additional (inelastic) demand for the benchmark portfolio

- **Takeaway 2:** Tilt towards high-Δ stocks – i.e., generate alpha (net of private cost)

Asset Prices

- Market clearing: $\lambda_D x^D + \lambda_M x^M = \bar{x}$
- Asset prices are

$$S = \mu - \gamma\Sigma\Lambda\bar{x} + \underbrace{\gamma\Sigma\Lambda\boldsymbol{\lambda_M}\frac{\boldsymbol{b\theta}}{\boldsymbol{a}}}_{\text{price pressure due to benchmarking}} + \Lambda\underbrace{\boldsymbol{\lambda_M}\frac{\boldsymbol{\Delta} - \frac{\boldsymbol{\psi}}{\boldsymbol{a}}}{\boldsymbol{a}}}_{\text{alpha chasing}}$$

where $\Lambda = \left[\frac{\lambda_M}{a} + \lambda_D\right]^{-1}$ modifies the market's effective risk aversion

- Each manager is a price taker, but their contracts collectively have price impact

Privately Optimal Contracts

- Fund investor's problem

$$\max_{a,b,\theta,c} U^F$$

$$\text{s.t.} \qquad x^M = \Sigma^{-1}\frac{\Delta - \frac{\psi}{a} + \mu - S}{a\gamma} + \frac{b\theta}{a} \qquad (IC)$$

$$U^M \geq \underline{U} \qquad (PC)$$

- Fund investors (and portfolio managers) take prices as given

- **Result 1 (Benchmarking).** Benchmarking is optimal, $b > 0$.

The Role of Benchmarking

- Recall fund manager's optimal portfolio

$$x^M = \Sigma^{-1} \frac{\Delta - \frac{\psi}{a} + \mu - S}{a\gamma} + \frac{b\theta}{a}$$

- Higher "skin-in-the-game" a induces the manager to invest more in stocks with higher abnormal returns – boost alpha
- But higher a exposes the fund manager to more risk
- Benchmarking shields the manager from some of the risk, $b > 0$
- Adjusting benchmark weights θ fine-tunes incentive provision for different stocks

Social Planner's Problem

- Fund investors do not internalize the effects of contracts on prices, thereby imposing a pecuniary externality on other agents
- Social planner's problem:

$$\max_{a,b,\theta,c} \omega_F U^F + \omega_D U^D$$

subject to manager's participation constraint and *IC*

$$x^M = \Sigma^{-1} \frac{\Delta - \psi/a + \mu - S(a, b\theta)}{a\gamma} + \frac{b\theta}{a}$$

Socially vs. Privately Optimal Contracts

Proposition 2 (Too Much Benchmarking) In the equilibrium with the socially optimal contract, both a and b are lower than in the privately optimal one:

$$a^{social} < a^{private}, \; b^{social} < b^{private}.$$

- To incentivize portfolio managers to generate higher returns, fund investors use incentive contracts ($a > 1/2$ and $b > 0$)
- This pushes up prices, reduces returns, and thus reduces the marginal benefit of incentive provision for everybody else
- Planner recognizes this and opts for less incentive provision and less benchmarking

Crowded Trades and Excessive Costs

- **Proposition 3** Compared to the equilibrium with the privately optimal contract, in the equilibrium with the socially optimal contract

    (i) asset prices are lower, $S^{social} < S^{private}$, and hence expected returns are higher

    (ii) fund managers' costs are lower, $\psi^{\top} x^{M}_{social} < \psi^{\top} x^{M}_{private}$

- contributes to the debate on whether costs of asset management are excessive and are justified by the returns

Socially vs. Privately Optimal Benchmark Weights

- Solve for the weights of stocks in the benchmark
- In our economy, optimal benchmark is different from market portfolio
- Socially and privately optimal benchmark weights differ

Conclusion

In a world where generating alpha is costly for asset managers, we show:

- Benchmarking is optimal
- Privately optimal level of benchmarking exceeds socially optimal level
- Private incentive provision is excessive
- Prices are lower in the social equilibrium
  - Trades are less crowded
  - Asset management cost is lower
- Optimal benchmark is different from market portfolio
  - The weights depend importantly on the potential for abnormal returns and the cost of generating them

Social Planner's Problem in More Detail

Planner takes into account that prices are affected by contracts and solves Back

$$\max_{a,b,c,\theta,x,x^D} \omega_F U^F + \omega_D U^D$$

$$\text{s.t.} \quad U^M \geq u_0 \qquad (PC)$$

$$x = \Sigma^{-1} \frac{\Delta - \psi/a + \mu - S}{a\gamma} + \frac{b\theta}{a} \qquad (IC)$$

$$x^D = \Sigma^{-1} \frac{\mu - S}{\gamma} \qquad \textit{(direct investors' demand)}$$

where

$$U^F = \left(x_{-1}^F\right)^\top S + x^\top (1-a)\Delta + z^\top(\mu - S) - \frac{\gamma}{2}\left[z^\top \Sigma z + (1-a)^2 \sigma_\varepsilon^2\right] - c$$

$$U^M = x^\top (a\,\Delta - \psi) + y^\top (\mu - S) - \frac{\gamma}{2}\left[y^\top \Sigma y + a^2 \sigma_\varepsilon^2\right] + c$$

$$U^D = \left(x_{-1}^D\right)^\top S + \left(x^D\right)^\top (\mu - S) - \frac{\gamma}{2}\left(x^D\right)^\top \Sigma \left(x^D\right)$$

- The dependence of S on a and $b\theta$ in the IC (M's demand function) creates an inefficiency

Empirical Evidence (US Mutual Funds)

Panel A: Summary statistics of compensation structures

	# of Obs.	**% of Sample**
Total	9,452	100%
Fixed salary	122	1.29%
Non-fixed salary	9,330	98.71%
Performance pay	7,278	77.00%
Advisor-profit pay	4,949	52.36%
AUM pay	2,031	21.49%
Deferred compensation	2,683	28.39%

Source: Ma, Tang and Gomez (2019)

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Empirical Evidence (US Mutual Funds)

Panel D: Statistics on the relative weight of bonus vs. base salary

Cases with Bonus/Salary ratio reported	***Observations***	***%***
Bonus/Salary < 100%	165	30.4%
100% ≤ Bonus/Salary ≤ 200%	218	40.1%
Bonus/Salary > 200%	160	29.5%
Total	543	100.0%

Cases with implied information on Bonus/Salary ratio	***Observations***	***%***
Bonus may exceed the base salary	1,394	36.8%
Multiple times the base salary	465	12.3%
Significant/material/substantial portion of total comp.	1,709	45.0%
Strong bonus potential/generous bonus	224	5.9%
Total	3,792	100.0%

Source: Ma, Tang and Gomez (2019)

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First Best

Suppose that x is observable

- Optimal contract: $a = 1/2$, $b = 0$
- Demand:
$$x^{FB} = \Sigma^{-1} \frac{\Delta - \psi + \mu - S}{\gamma/2}$$
- Prices:
$$S^{FB} = \mu - \gamma \Sigma \bar{x} + 2\lambda_M (\Delta - \psi)$$
- Facing $a = 1/2$ and $b = 0$, if the manager chose x privately, she'd choose
$$x = \Sigma^{-1} \frac{\Delta - 2\psi + \mu - S}{\gamma/2} < x^{FB}$$

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