

Market Dynamics of Risk-On and Risk-Off Incentives and their Effect on Asset Prices

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Motivation: Statement of Additional Information (SAI)

- **March 2005: The SEC adopted a new rule requiring mutual funds**
- **To disclose the compensation structure of their portfolio managers**
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- **March 2005: The SEC adopted a new rule requiring mutual funds**
 - **To disclose the compensation structure of their portfolio managers**
(Statement of Additional Information (SAI))
 - (i) **Nearly all mutual fund managers have a performance-based bonus**
 - The bonus is tied to their accumulated performance relative to the index.
 - (ii) **Consistent performance over the long-term is important**
 - (iii) **Managers can be fired when performing below expectations**
- ⇒ **Asset managers reduce portfolio risk when performance exceeds the benchmark**

Motivation: Mutual Funds Compensation Structure

- **When managers underperform the benchmark**
 - ⇒ **Incentives to do better than the benchmark to:**
 - (i) receive a bonus, (ii) maintain consistent performance, (iii) avoid job loss
- **When managers outperform the benchmark**
 - ⇒ **Incentives to maintain performance to reduce the risk of**
 - (i) losing a bonus, (ii) inconsistent outperformance, (iii) losing their job
- **Asset managers' payoff is time-varying and (state-dependent)**
 - Underperformance** ⇒ payoff is convex w.r.t to the benchmark ⇒ Risk-on
 - Outperformance** ⇒ payoff is concave w.r.t. to the benchmark ⇒ Risk-off
- **S-shaped objective where the inflection point is the benchmark**

First study of the equilibrium prices with S-shape incentives

Q: What are the equilibrium implications of the S-shape incentives?

- How does the equilibrium mechanism work?

Q: Can the S-shape incentives explain predictability in returns?

- **It is crucial to model the scenarios jointly within a dynamic framework**
 - ⇒ Managers' accumulated performance is generally close to the benchmark

Main Result (i)

- Time-series Momentum in (raw) returns when managers outperform
 - Portfolio Ret = -2% , Index Ret = -5% \Rightarrow Next month: Portfolio Ret < 0
 - Portfolio Ret = 5% , Index Ret = 2% \Rightarrow Next month: Portfolio Ret > 0
- Time-series Reversal in (raw) returns when managers underperform
 - Portfolio Ret = -5% , Index Ret = -2% \Rightarrow Next month: Portfolio Ret > 0
 - Portfolio Ret = 2% , Index Ret = 5% \Rightarrow Next month: Portfolio Ret < 0
- Preliminary Evidence: novel empirical (preliminary) analysis
 - Active mutual funds with a broad market category

Main Result (ii)

<i>Funds with at least one instance of underperformance and one instance of outperformance in the prior month</i>			
	Total Success	Momentum Success	Reversal Success
Portfolio – Index > 0	53.3%	53.8%	52.7%
Portfolio – Index > 1.0%	55.8%	55.3%	55.8%
Portfolio – Index > 2.0%	58.8%	56.5%	59.6%

<i>Funds with at least 18 instances of underperformance and 18 instances of outperformance in the prior month</i>			
	Total Success	Momentum Success	Reversal Success
Portfolio – Index > 0	53.7%	54.6%	52.7%
Portfolio – Index > 1.0%	57.0%	57.4%	56.4%
Portfolio – Index > 2.0%	62.1%	63.3%	60.7%

- Portfolio > Index + 2%: ⇒ predict time-series momentum:

- This month: Portfolio raw ret < 0 ⇒ Next month: Portfolio raw ret < 0
- This month: Portfolio raw ret > 0 ⇒ Next month: Portfolio raw ret > 0
- Correct prediction: 56.5%

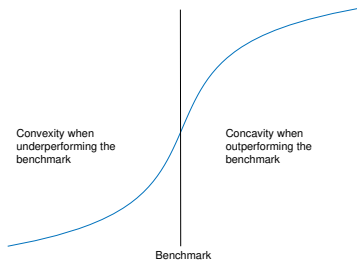
- Portfolio < Index – 2%: ⇒ predict time-series reversal:

- This month: Portfolio raw ret < 0 ⇒ Next month: Portfolio raw ret > 0
- This month: Portfolio raw ret > 0 ⇒ Next month: Portfolio raw ret < 0
- Correct prediction: 59.6%

Motivation: S-Shaped Objective In Asset Management

- **S-Shaped objective and its pricing implications are unique**
in asset management
 - **Decision Theory: initially designed to explain household decisions:**
 - Friedman and Savage (1948)
 - Levy (1969)
 - Kahneman and Tversky (1979)
 - Aristidou, Giga, Lee, and Zapatero (2025)
- ⇒ **All use an S-shape utility**
- **Key distinction:**
The reference is the benchmark and not the value of
assets under management

Motivation: The Objective of Asset Managers



Implications (i): Predictability with Complete Information

- **Momentum and reversal arise endogenously in equilibrium**
 - A complete information environment
 - With perfectly rational asset managers (no one makes mistakes)
- **Predictability is unique in complete information environments**
 - Common wisdom \Rightarrow if investors can predict returns \Rightarrow they should act now
 - \Rightarrow which is why the literature rely on irrationality or incomplete information
- **In this paper, it is suboptimal to act on this predictability**
 - \Rightarrow **Due to the friction introduced by the incentives of asset managers**
(it is better not to act on the predictability)

Economic Intuition (i)

(i) Incentives

Accumulated performance predicts the incentives to outperform vs. maintaining

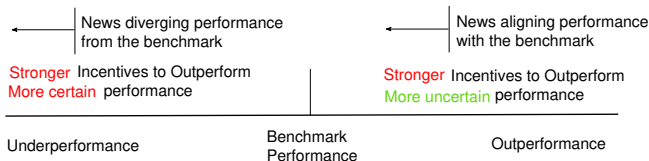
⇒ **a predictable change in prices**

(ii) Uncertainty of Performance

• Performance diverges from the benchmark ⇒ high certainty of performance

• Performance converges to the benchmark ⇒ low certainty of performance

⇒ **a predictable change in quantity of risk**



Economic Intuition (ii) - Incentives

$$\Sigma^S \pi_t^A = \theta_t + [(1 - \gamma_1)(1 - \mathcal{H}_{2t}) - (\gamma_2 - 1)\mathcal{H}_{2t}] \nu + \underbrace{[(1 - \gamma_1)\mathcal{H}_{2t} - (\gamma_2 - 1)(1 - \mathcal{H}_{2t})]}_{\text{Benchmark Exposure}} \sigma^I$$

Risk-On $\leftarrow 1 \leftarrow \mathcal{H}_{it} \rightarrow 0 \rightarrow$ **Risk-Off**, $0 < \gamma_1 < 1 < \gamma_2$

Accumulated performance w.r.t the benchmark $\downarrow \Rightarrow \mathcal{H}_{2t} \uparrow 1$

Larger benchmark exposure \Rightarrow **Stronger demand for the benchmark**
 \Rightarrow Positive return reaction

$$\theta_t = \underbrace{[\gamma_1(1 - \mathcal{H}_{1t}) + \gamma_2(\mathcal{H}_{1t})]}_{\text{CRRR effect}} \nu + \underbrace{[-(1 - \gamma_1)\mathcal{H}_{1t} + (\gamma_2 - 1)(1 - \mathcal{H}_{1t})]}_{\text{Incentives Channel}} \sigma^I,$$

Accumulated performance w.r.t the benchmark $\downarrow \Rightarrow \mathcal{H}_{1t} \uparrow 1 \Rightarrow \theta_t \downarrow$

\Rightarrow **Stronger future return reaction** ($\mu_{it}^S = \theta_t^S \sigma_{it}^S$) \downarrow

\Rightarrow Expected return falls \Rightarrow Reversal (due to a pricing effect)

Economic Intuition (ii) - Uncertainty of Performance

$$\sigma_{1t}^S = \sigma_1^D + (\gamma_2 - \gamma_1) (\sigma^I - \nu) (\mathcal{H}_{3t} - \mathcal{H}_{1t})$$

Risk-On $\leftarrow 1 \leftarrow \mathcal{H}_{it} \rightarrow 0 \rightarrow$ **Risk-Off**, $0 < \gamma_1 < 1 < \gamma_2$

When accumulated performance is more aligned $\Rightarrow \sigma_{1t}^S \uparrow$

\Rightarrow Markets are riskier

- **Outperformance** \Rightarrow accumulated performance converges to the benchmark
 - \Rightarrow The benchmark become riskier \Rightarrow Expected return rises ($\mu_{it}^S = \theta'_t \sigma_{it}^S$) \uparrow
 - \Rightarrow Momentum (due to a quantity of risk effect)
- **Underperformance** \Rightarrow accumulated performance diverges away
 - \Rightarrow The benchmark risk is reduced \Rightarrow Expected return falls ($\mu_{it}^S = \theta'_t \sigma_{it}^S$) \downarrow
 - \Rightarrow Reversal (due to a quantity of risk effect)

Conclusion

- We study the asset pricing equilibrium with S-shape objective
- Main Findings
 - Momentum rises when asset managers outperform
 - Reversal when they underperform
 - Both in the time-series and in long-short portfolios
- Strong evidence of the mechanism in the data

Thank you!