Summary of *Machine-learning the skill of mutual fund managers*

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1. **What are the research questions?**

   - Can ML differentiate outperformance fund? Which characteristic helpful?

2. **Why are the research questions interesting?**

   - Asset management industry is enormous and growing rapidly..
     - U.S. mutual funds had $24 trillion,half in equity mutual funds
     - Over 100 million Americans rely on such funds to meet financial objectives.
   - literature found mixed results:invest performance of actively-traded equity mutual funds.
   - We revisit the evidence using modern techniques,

3. **What is the paper' s contribution?**

   - contribute on literature on factors affect fund performance.
     - **Prior**:fees, before-fee performance,advertising,manager compensation,flow,mom
     - **Extend**:revives the predictive role of flows;fund past performance is important
   - contribute on literature on fund return predictability
     - **Prior**:Active share,return gap predict alpha,significance for short but not long leg
     - **Extend**:
       * 2 times abnormal return,short and long leg significance both;
       * novel interaction effects between sentiment and fund characteristics,
   - contribute on ML in finance.
     - **Prior**:predict fund total returns using holding-based stock characteristics.
     - **Extend**:richer information set;abnormal return

4. **What hypotheses are tested in the paper?**

   - abnormal returns as a prediction target is more effective than total returns, and sentiment may interact with fund characteristics.

   Do these hypotheses follow from theory? Explain logic of the hypotheses.

   - Abnormal returns better measures fund manager's skill beyond market;ML can handle a large number of features and better detect nonlinear interactions.

5. **Comment on the appropriateness of the sample,variable,model**

   - 1980-2019 equity mutual funds；46 stock characteristics, 13 fund characteristics, 1 overall state of the market (sentiment or macro-economic activity)；feedforward neural network
   - Is a single macro factor too simplistic?

6. **What difficulties arise in drawing inferences from the empirical work?**

- abnormal compare with all return?

7. **Describe at least one publishable and feasible extension of this research.**

    - Consider incorporating more factors, such as ESG factors and additional macroeconomic variables.