FinTech Brings a Bias from Psychology Labs to a Two-trillion-dollar Market

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Summary

Objective: This paper investigates how the order of survey responses affects clients' surveyed risk profiles and actual investment decision.

Methods & Samples:

- A **nationwide survey** of more than 3,000 experienced U.S. investors from October 27, 2020, to November 2, 2020
- A **preregistered RCT** involving more than 10,000 investors in China from October 25 to December 27, 2024

Findings:

- Reversing the response order increases users' risk scores and makes them more likely to be classified into higher risk categories
- Conditional on investing, reverse-order users allocate more to aggressive or high-risk products
- Reverse-order users are less likely to participate in both robo-advised investments and self-directed investments, suggesting that nudging backfired

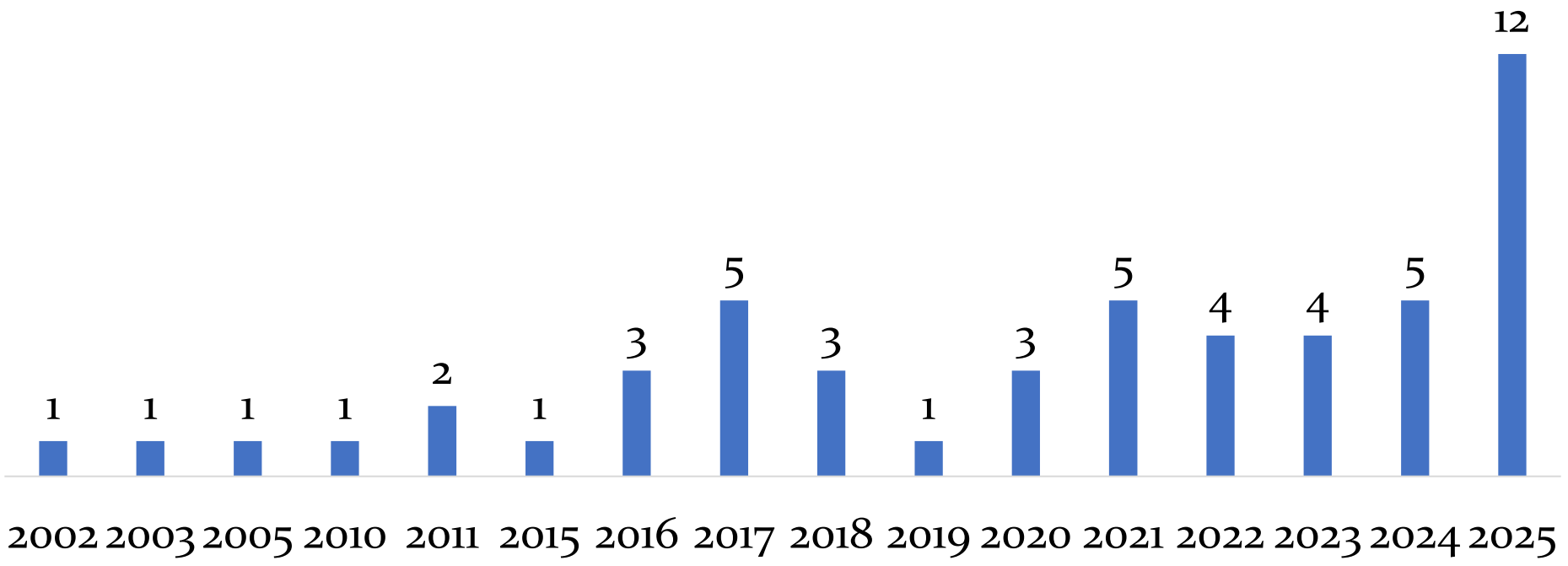
Comments

1. Literature review on RCT
2. Strengthening the FinTech Framing
3. Bias vs. ambiguity
4. Subjective and objective questions
5. The reverse-order effect
6. Investment in the RCT test
7. Advisor-user mismatch and platform disengagement
8. Survey inputs vs. revealed investment behavior
9. Ethical implications
10. C5 Decomposition
11. Others

1.Literature review on RCT: number of papers by year

A total of 52 articles utilizing field experiment methods have been published in FT50 journals in the fields of finance and accounting.

- The number of papers exhibits a clear upward trend over time
- There is a pronounced surge in 2025, when the output exceeds ten papers, representing the highest level across the entire period.



1.Literature review on RCT: Number of papers by journal

The *Journal of Accounting Research* and the *Review of Financial Studies* have published the largest number of papers using field experiments.

Table 1. Papers in finance journals

Journal	Number of papers
Journal of Finance	8
Journal of Financial Economics	0
Review of Financial Studies	**8**
Journal of Financial and Quantitative Analysis	1
Review of Finance	2
Management Science (finance track)	7
Total	**26**

Table 2. Papers in accounting journals

Journal	Number of papers
The Accounting Review	5
Journal of Accounting and Economics	5
Journal of Accounting Research	**10**
Contemporary Accounting Research	2
Review of Accounting Studies	2
Management Science (Accounting track)	2
Total	**26**

1.Literature review on RCT: Number of papers by research field

Behavioral finance and management accounting have the largest number of papers using field experiments.

Table 3. Papers in finance

Research field	Number of Papers
Behavioral finance	**10**
Financial education	5
Entrepreneurial finance	4
Fintech	4
Houshold finance	3
Asset pricing	1
Corporate finance	1
Insurance	1
Total	**29**

Table 4. Papars in accounting

Research field	Number of Papers
Management accounting	**12**
Information disclosure	6
ESG	3
Accounting standards	2
Total	**23**

This paper **nicely contributes** to the literature on household finance using the RCT approach.

2. Strengthening the FinTech Framing

The framing of the study:

Modern technology expands access to customized financial services, but the standardized process of eliciting user information may introduce psychological biases.

1. What is distinctive about robo-advising relative to traditional financial advice?
    - Survey-based elicitation and the associated biases are not unique to FinTech financial service providers
    - Traditional financial advisors, banks, insurers, and pension platforms also use risk-tolerance questionnaires
    - Is the response-order effect more consequential in robo-advising because traditional financial advisory services can mitigate order effects by human interaction?
    - Or do investors treat advice differently from different service providers?

2. Strengthening the FinTech Framing

2. Why do survey-based inputs remain important in data-rich financial platforms?
    - FinTech literature usually suggests that technology and data are expected to mitigate traditional financial frictions and biases (e.g., Philippon, 2019; Howell et al., 2024; Jame et al., 2022).
    - Can FinTech firms employ alternative data and algorithms mitigate survey-induced psychological biases?

3. Bias vs. ambiguity

Biases induced by the surveys would be embedded in those recommendations and hence influence investors' financial decisions

What is the gender of this panda?
A. Male
B. Female

- If an investor has no idear on her risk tolerance level, any answer could be considered as the unbiased answer.
- Any investment choices would be indifferent to this investor, right?

4. Subjective and objective questions

Our second hypothesis is that the response-order effect should be stronger for **subjective** questions than for **objective** ones

Among subjective questions, e.g.,

- Question 4: For the goal(s) of your overall investment portfolio, what is your approximate time horizon?
- Question 13: What is your political leaning?

1) Not sure whether these questions are purely subjective or not.

2) It might be better to classify questions into certain vs. uncertain questions?

4. Subjective and objective questions

Question 4: For the goal(s) of your overall investment portfolio, what is your approximate time horizon?

- Less than 1 year/ 1 - 5 years/6 - 10 years/11 - 20 years/More than 20 years/Beyond my lifespan (estate)

How certain do you feel about your answer to this question?

- Very certain: I have a clear idea about my investment horizon
- Somewhat certain: I have a rough idea about my investment horizon
- Not certain: I have barely considered my investment horizon

You can use the **answer on certainty** to conduct the subsample analyses for the test of the order effect

5. The reverse-order effect

To test whether the order effect persists when large financial stakes are involved, they use the following regression

$$Y_i = \alpha + b\ Reverse_i + \gamma X_i + e_i$$

The coefficient *b* is interpreted as the reverse-order effect.

- The effect might be overestimated because the original order might also be biased.

- The true effect can be estimated relative to the **unbiased order**, which is not the original order.

6. Investment in the RCT test

The samples of the RCT test

- The entire RCT sample has 6,440 observations
- The sample for users who made robo-advised investments has 1,746 observations
- The sample for users who made self-directed investments has 1,419 observations

1419+1746/6440=49.1%

- Almost half of the RCT participants **do not make any investment** during the sample period.

- What **do they do** for the rest of surveyed investors? They simply submitted surveys without any investment.

7. Advisor-User Mismatch and Platform Disengagement

If the *assigned risk profile* does not match users' *self-perceived preferences*, users may become less confident in the advisor's recommendations and **reduce their platform engagement**.

Implication:
The response-order effect may affect not only **within-platform allocation**, but also the **advisor-user match** and users' decision to use the platform.

Potential tests:
- Subsequent platform usage or login frequency
- Net fund inflows or withdrawals
- Retaking the risk assessment
- Abandoning the recommendation process
- Future use of both robo-advised and self-directed products

8. Survey inputs vs. revealed investment behavior

The RCT is conducted among both new users and existing users of the Advisor.

The Advisor's app displays products based on a proprietary algorithm that incorporates both clients' **risk scores** and **investment histories**.

This raises an interesting distinction between new and existing users:

- **New users**: The Advisor has limited revealed-preference information, so that risk classifications may rely more heavily on questionnaire responses
- **Existing users**: prior holdings and investment histories may provide additional information about their underlying risk preferences

8. Survey inputs vs. revealed investment behavior

Testable conjecture:

- *NewUser* is associated with higher risk scores/categories.
- New users are less likely to use robo-advised strategies but more likely to use self-directed products.

Is the order effect stronger among new users, for whom questionnaire responses may play a greater role?

Does prior investment behavior attenuate the effect of reverse-order questionnaires on risk assessments and investment decisions?

More broadly, can FinTech data and algorithms help mitigate the psychological bias introduced by survey-based elicitation?

9. Ethical implications

The paper raises an important ethical concern: robo-advisors may use questionnaire design to steer investors toward products that are more profitable for the platform but suboptimal for clients.

The ethical interpretation depends on the platform's actual design practice:

- **Unintended design effect**: The response order is fixed or arbitrary, and survey design unintentionally affects risk classifications and investment choices
- **Strategic manipulation**: The Advisor knowingly designs or selectively assigns questionnaire formats to steer users toward higher risk classifications or more profitable products

The current evidence identifies the first step: response order affects measured risk tolerance and investment behavior

9. Ethical implications

But stronger ethical claims may require more evidence on:

- Questionnaire assignment practice: Whether the Advisor uses different response orders for different users in actual practice.

- The Advisor's revenue model: Whether different products, strategies, or risk categories generate different fees, commissions, or other benefits for the Advisor.

- How high is the asset-misallocation cost when order-induced risk classifications deviate from users' underlying preferences?

- Would users make different choices if they were aware of the response-order bias?

10. C5 Decomposition

The paper decomposes a user's risk assessment into risk tolerance determined by the response order and innate risk tolerance:

$$C5_i = \alpha + \underbrace{\beta Reverse_i + \gamma X_i}_{\substack{Determined\ by \\ the\ response\ order}} + \underbrace{\varepsilon_i}_{Innate\ risk\ tolerance}$$

The decomposition is useful, but the predicted C5 may also reflect observable user characteristics X_i possibly related to innate risk tolerance.

Can the authors isolate the component of C5 induced only by response order, and distinguish it from the component explained by user characteristics?

$$C5_i = \alpha + \underbrace{\beta Reverse_i}_{Reverse\ component} + \underbrace{\gamma X_i}_{\substack{Observable-characteristic \\ component}} + \underbrace{\varepsilon_i}_{Residual}$$

11. Others

- Table 5: Reverse significantly increases risk scores and risk categories, but the incremental R2 of response order may be limited relative to age, gender, assets, new-user status, and investment histories. How economically important is the order effect compared with observable investor characteristics?

- The RMB 3,280 / RMB 3,090 increase in risky assets investment is statistically meaningful, but it is still not so much in RMB?

- Does the response-order effect persist over time, or does it fade as users gain experience with the platform?

Conclusion

Research question: timely

Findings: intuitive

Empirical methods: robust

Main comments:

- Bias vs. ambiguity
- Strengthening the framing: From survey bias to FinTech bias