Does Experience Matter to Investors?

Evidence from Indian IPOs

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Overview

- Workhorse economic models assume agents have stable preferences, and well-founded beliefs.
- Recent work suggests that experience strongly affects agents' behaviour in financial markets.
  - Malmendier and Nagel (2012, 2014), Campbell, Ramadorai, and Ranish (2014), many others.
- Concern: Inferences generally drawn from agents that self-selected into particular portfolios.
- Important remaining questions on mechanism:
  1. Does experience affect beliefs, preferences, information set, or all of the above?
  2. What types of experience matter most? Size, salience
  3. Is this evidence of rational learning or extrapolation (reinforcement learning)?

Disentangling the experience-behaviour correlation

- Standard approach: correlation between investor experience and investor behaviour.
  - But investor experience is endogenous!
- Example: Observed correlation between high past returns and future risk-taking behaviour.
  1. Selection on preferences: Risk seeking investors select risky stocks $\rightarrow$ experience high returns $\rightarrow$ buy riskier stocks.
  2. Selection on beliefs: Optimistic investors buy risky stocks $\rightarrow$ experience high returns $\rightarrow$ buy riskier stocks.
- Need exogenous variation in experience to eliminate self-selection questions.
- Exogenous variation plus large cross-section of agents: heterogenous treatment effects permit inferences about experience channels.

A neat experiment

- Our approach: exploit randomized variation in experience due to IPO lotteries.
  - How does a **randomly** allocated return experience affect future behaviour?
- Identification: battery of tests suggest allocations are indeed random
  - Control and treatment groups similar prior to allocation.
  - No omitted variables bias (i.e. preferences, beliefs, or information).
- Data allows us to study effects of experience shock on entire equity portfolio of individual investors.
  - Retail investors matter in India (~15% of market is retail owned).
- Also teaches us about role of luck in asset markets.
  - Workhorse theories (CAPM, factor models) predict luck as unimportant in aggregate.
  - Alternative (behavioural) theories predict role for luck on investor behavior, equilibrium returns.

Unique Indian IPO setting

- **35%** of each IPO *set aside for retail investors.*
- Retail investors: $\leq$ Rs. 100,000 (Rs. 200,000 since Oct 2010).
- Randomized allocation when retail demand $>$ supply (over subscription)

The IPO experiment: An example

- Total issue to retail investors: $10,000$ shares.
- Investors can bid for bins of 100, 200, or 300 shares.
- Minimum allocation: 100 shares.
- Over subscription ratio: OS $= \frac{15{,}000}{10{,}000} = 1.5$.

Share category (1)	Total no. applications (2)	Total Demand (3)	Allocation (#1)/OS (4)	% investors allocated (5)
100	100	10000	100	**66%**
200	22	4400	133	100%
300	2	600	200	100%

- **66% of investors chosen at random.**

Data

Sample period: 2007-2012

- **180** of the 246 IPOs over the period were over subscribed. We have data on **57** of these.
  - Mean over subscription ratio = 20 (Range: 1 - 60 times).
- Anonymized investor-level portfolio data for the universe of stock market participants in India (aggregated by PAN).
- Investor-level IPO-application data from administrative records of one of the largest share registry firms in India.
- Anonymized matching by providers of application data and portfolio data.

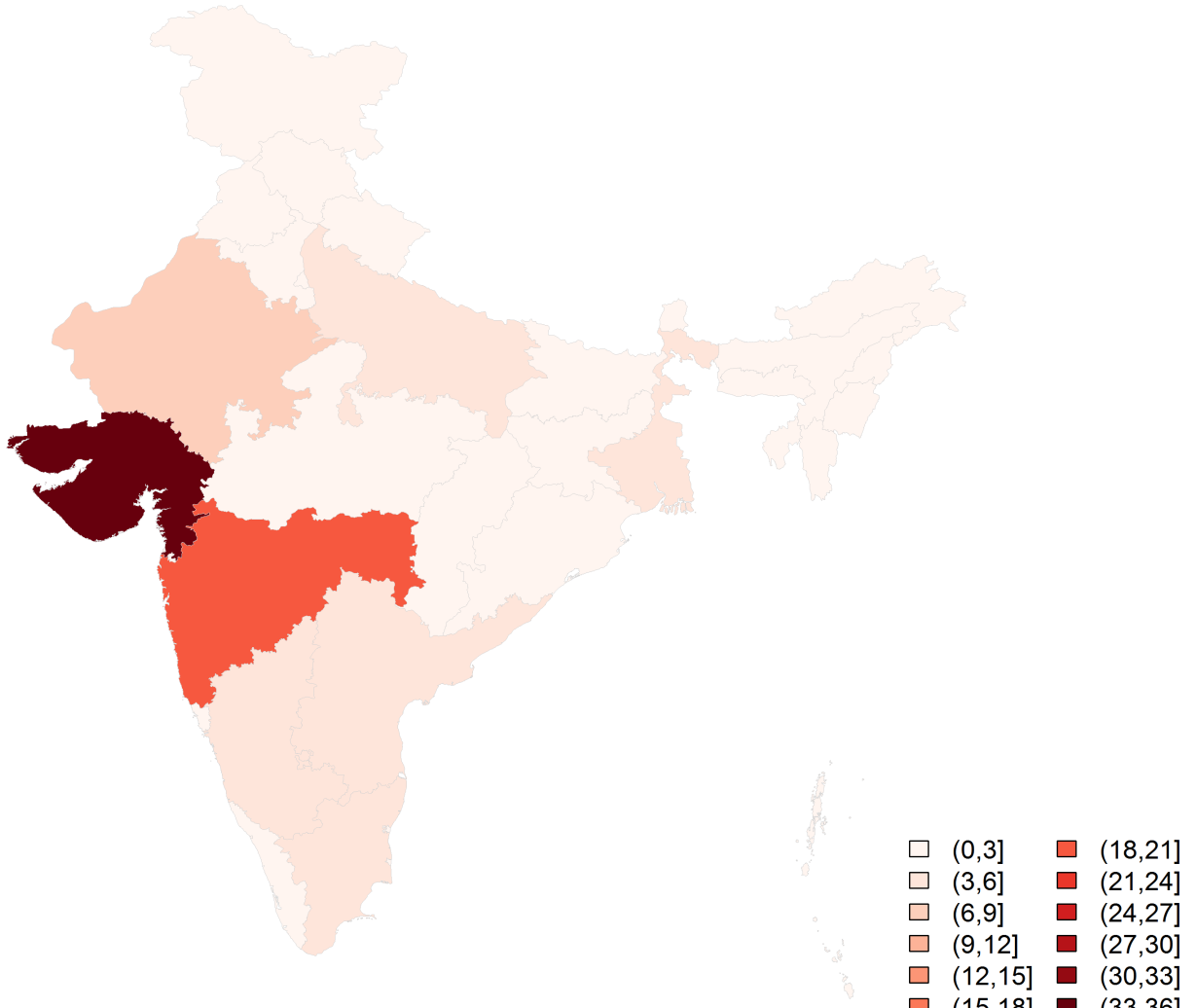
Data: Summary

- Total number of IPOs: 57

	Allotted	Not allotted	Total
No. of retail investors (per IPO)			
Mean	10,641	19,222	29,862
Std. dev	19,806	50,961	68,334
Total no. of retail investors	606,483	1,095,678	1,702,161
Total no. of unique retail investors	347,658	650,258	997,916

The geography of IPO applicants

Our sample



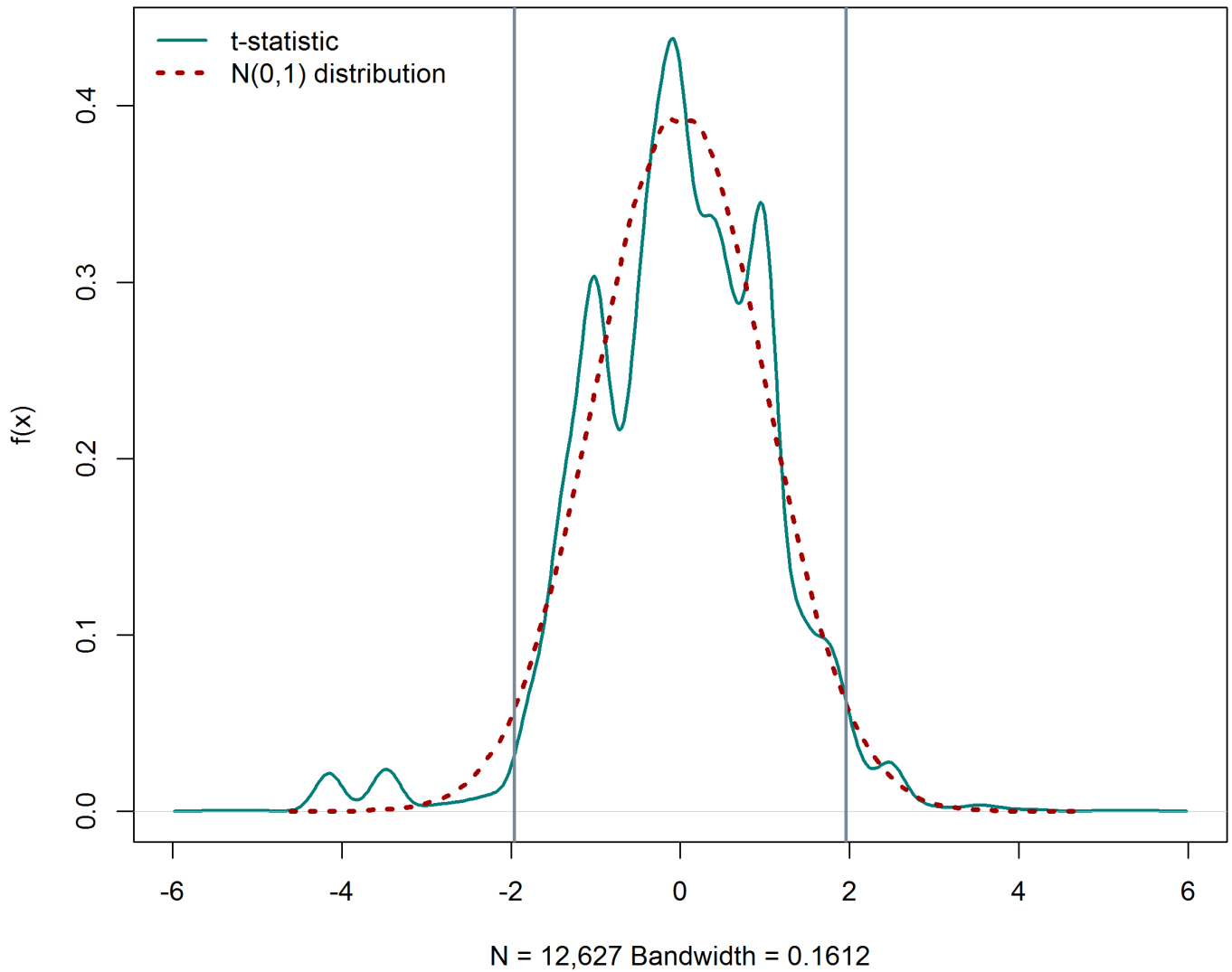
Randomization check

- Test robustness of randomization process in IPOs.
- Regression specification per IPO share category:

$$y = \alpha + \beta I(\text{success} = 1) + u$$

- Variable y: Application characteristics.
  - Cut-off bidder
  - Full demand schedule bidder
  - Depository where investor holds an account
  - State of the applicant
  - ASBA as payment mode
  - Cheque as payment mode
- Within each IPO share category, we expect β, the mean difference between the two groups to be **statistically insignificant**.

Randomization check: All characteristics



Empirical strategy

Object of interest: ρ

$$y_{ijc,s} = \alpha + \rho_s d_{ijc} + \sum_j \sum_c \gamma_{jc} d_{jc} + \beta X_{ij,t} + \epsilon_{ijc,s}$$

- $H_0 : \rho_s = 0$ Balance test Do not reject H_0 $\forall s \in [-6, -1]$
  Outcome test Reject H_0 $\forall s \in [0, 6]$
- $y_{ijc,s}$ Outcome variable of interest.
- d_{ijc} Indicator of whether investor was randomly allotted shares.
- d_{jc} Fixed effects for each application share category in each IPO.

The lottery experience

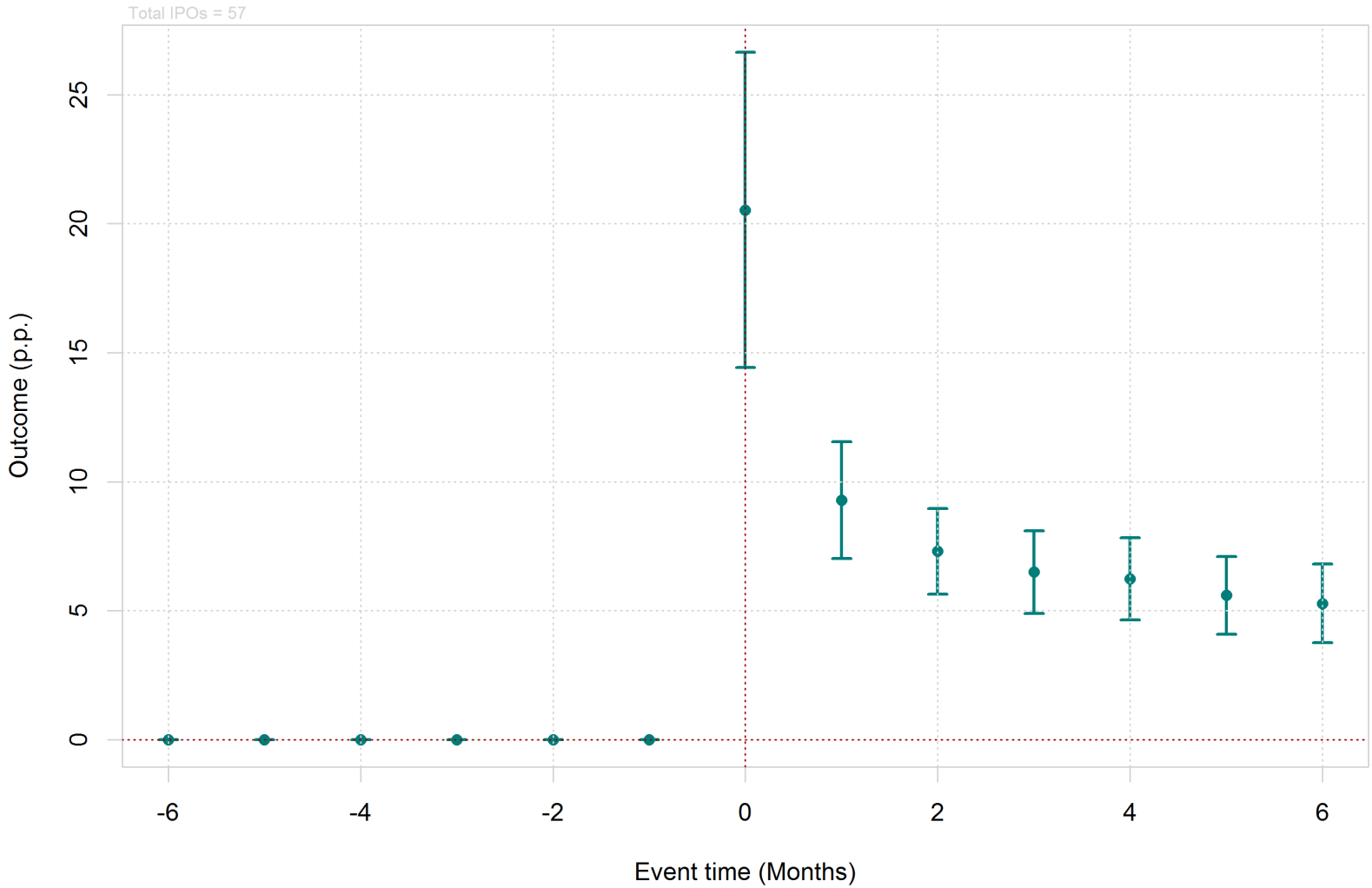
57 IPOs, 2007-2012

	First day returns (Closing price)	First day price variability (High - Low / Issue *100)
Mean	15.14%	36.52%
Median	9.28%	28.00%
Std. Dev.	38.32%	28.56%
Min	-66.45%	5.27%
Max	178.76%	142.87%

Portfolio weight of IPO security

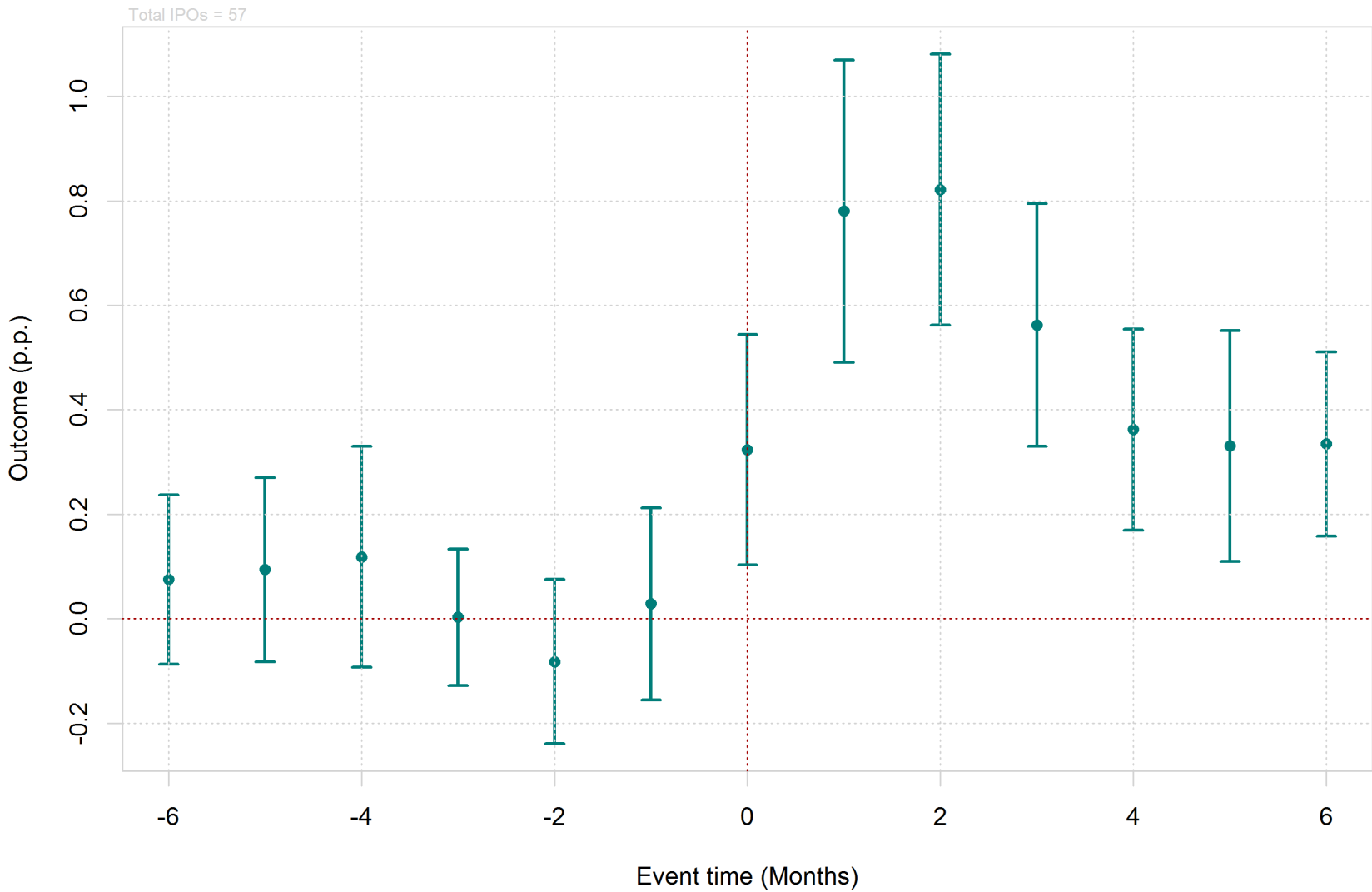
Non-trivial role in the investor's portfolio

$$y_{ijc,s} = \alpha + \rho_s d_{ijc} + \sum_j \sum_c \gamma_{jc} d_{jc} + \beta X_{ij,t} + \epsilon_{ijc,s}$$



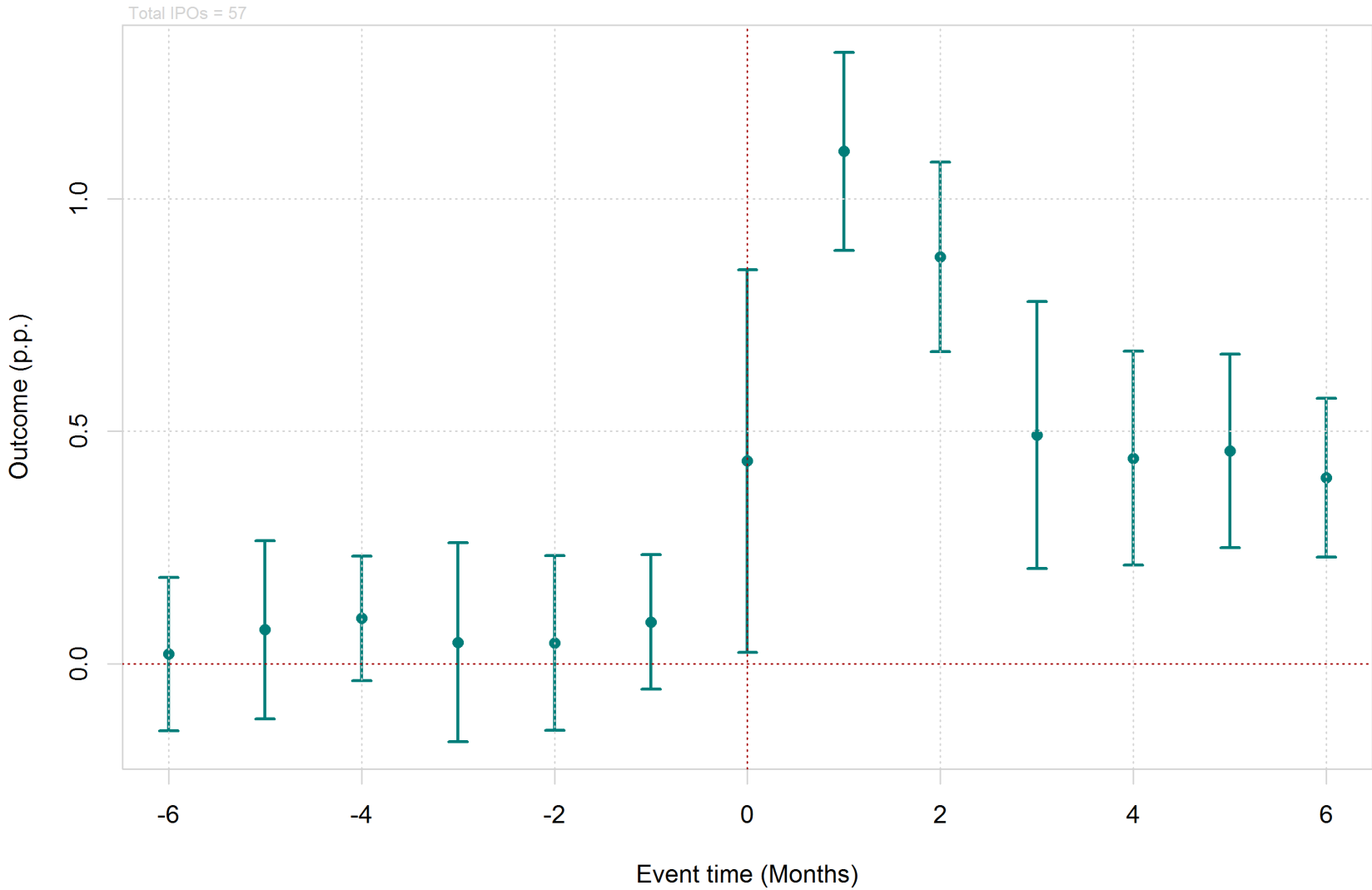
Experience effects on purchase

$y_{ijc} = I(\text{No. of securities purchased (Non-IPO security)} > 0)$



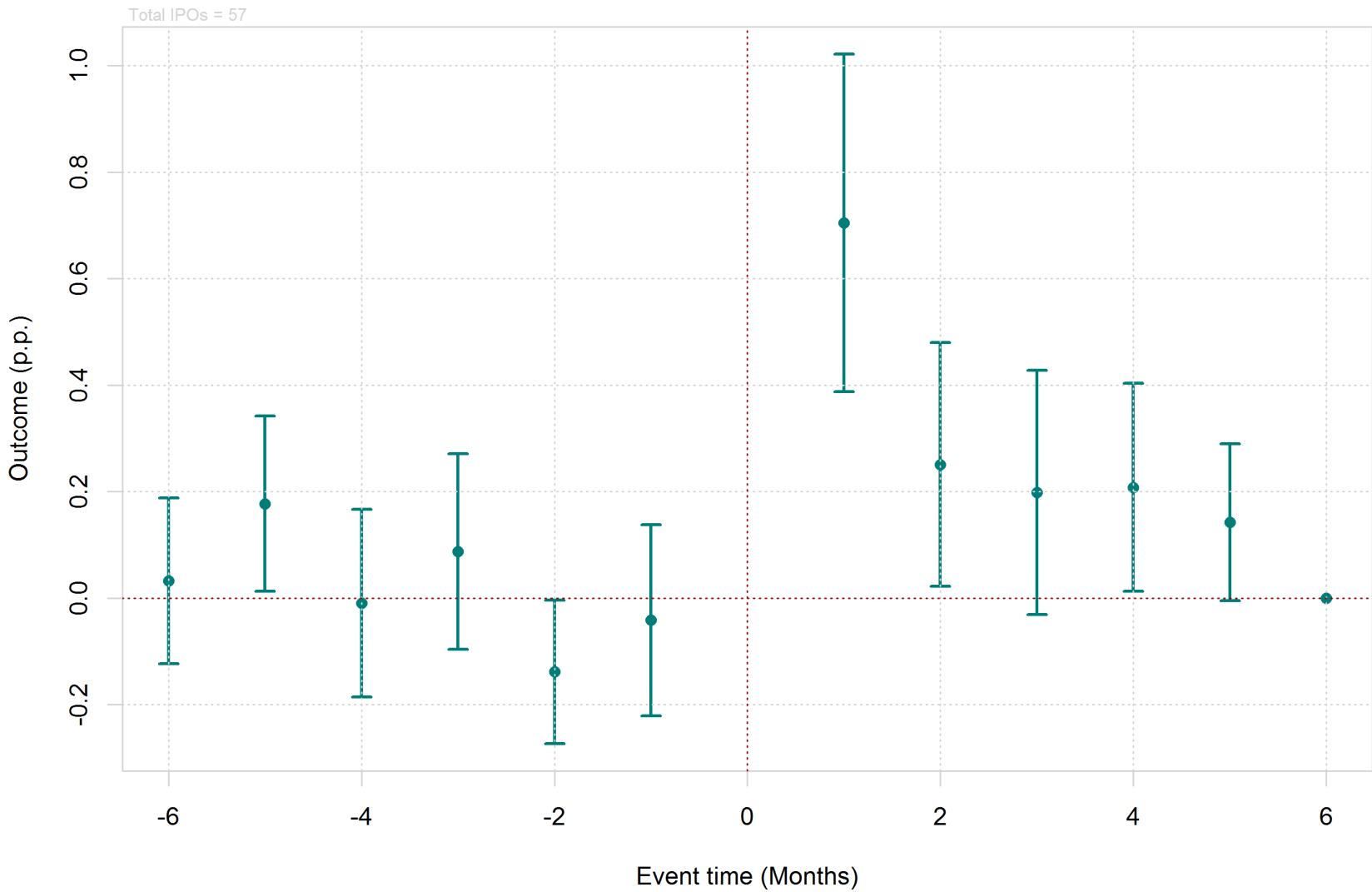
Experience effect on sale

$y_{ijc} = I(\text{No. of securities sold (Non-IPO security)} > 0)$



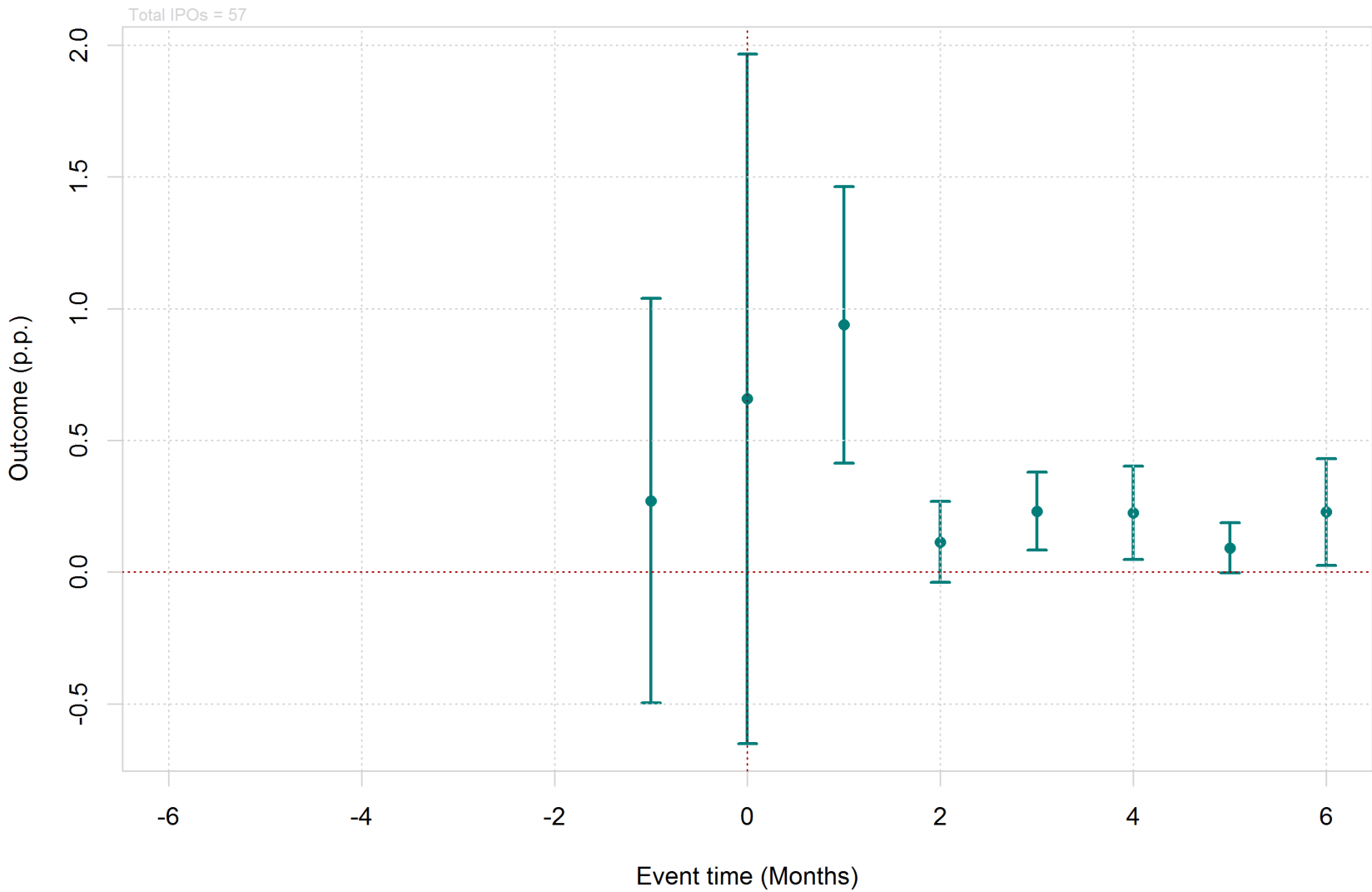
Experience effect on future IPO application

$y_{ijc} = I(\text{IPO application} > 0)$



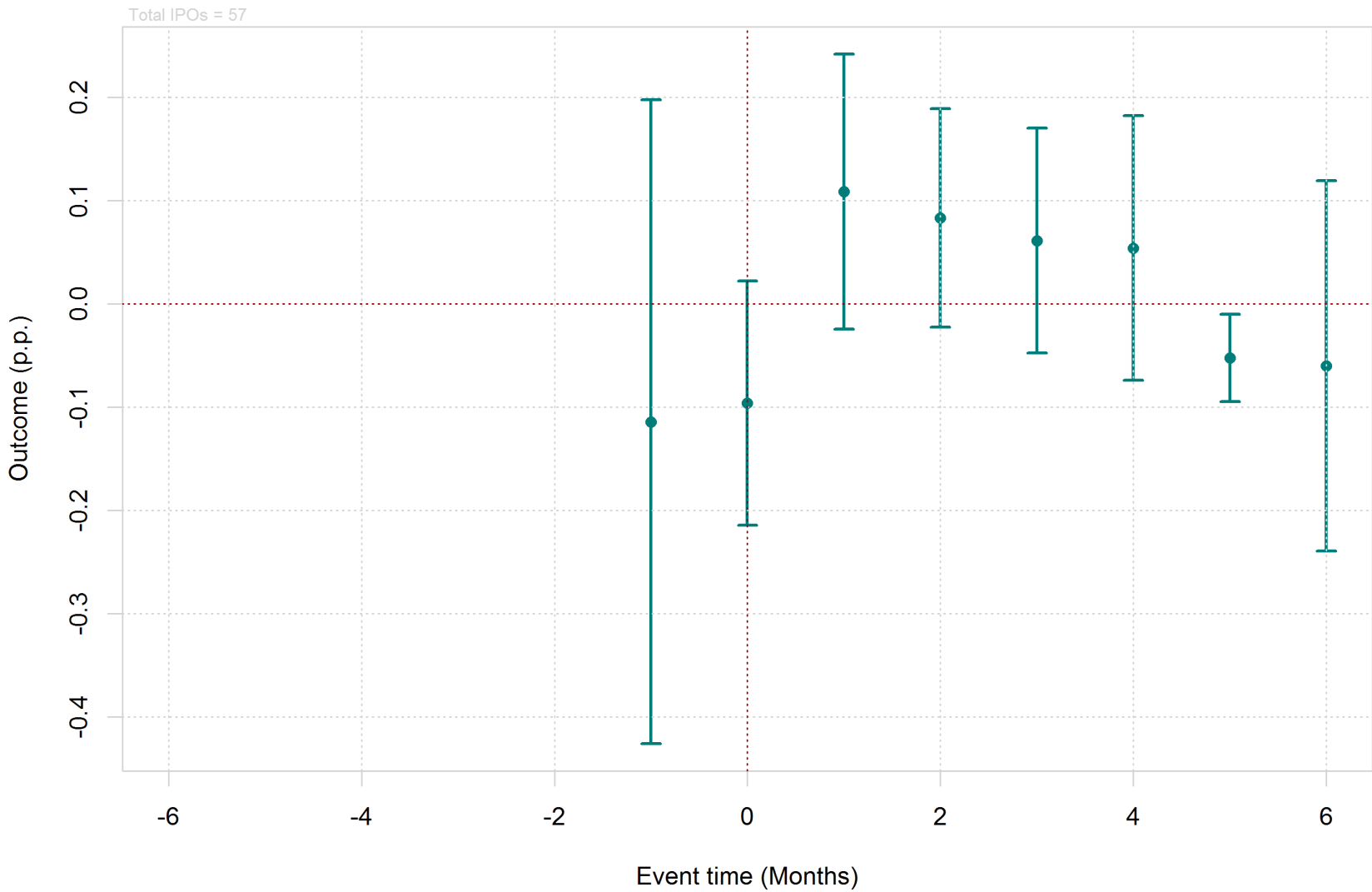
Experience effect on realized gains

y_{ijc} =Percentage of gains realized (Non-IPO security)



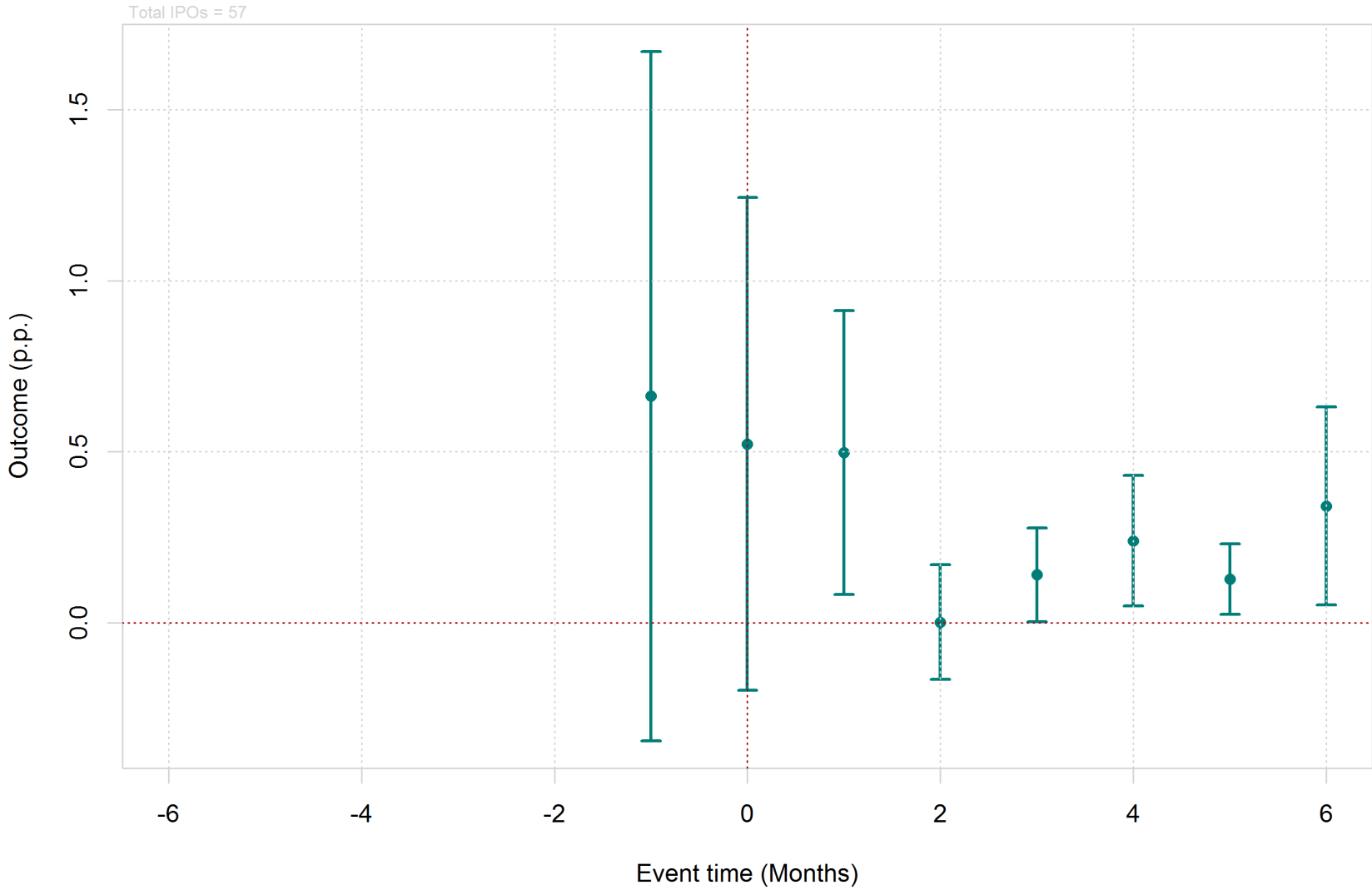
Experience effect on realized losses

y_{ijc} =Percentage of losses realized (Non-IPO security)



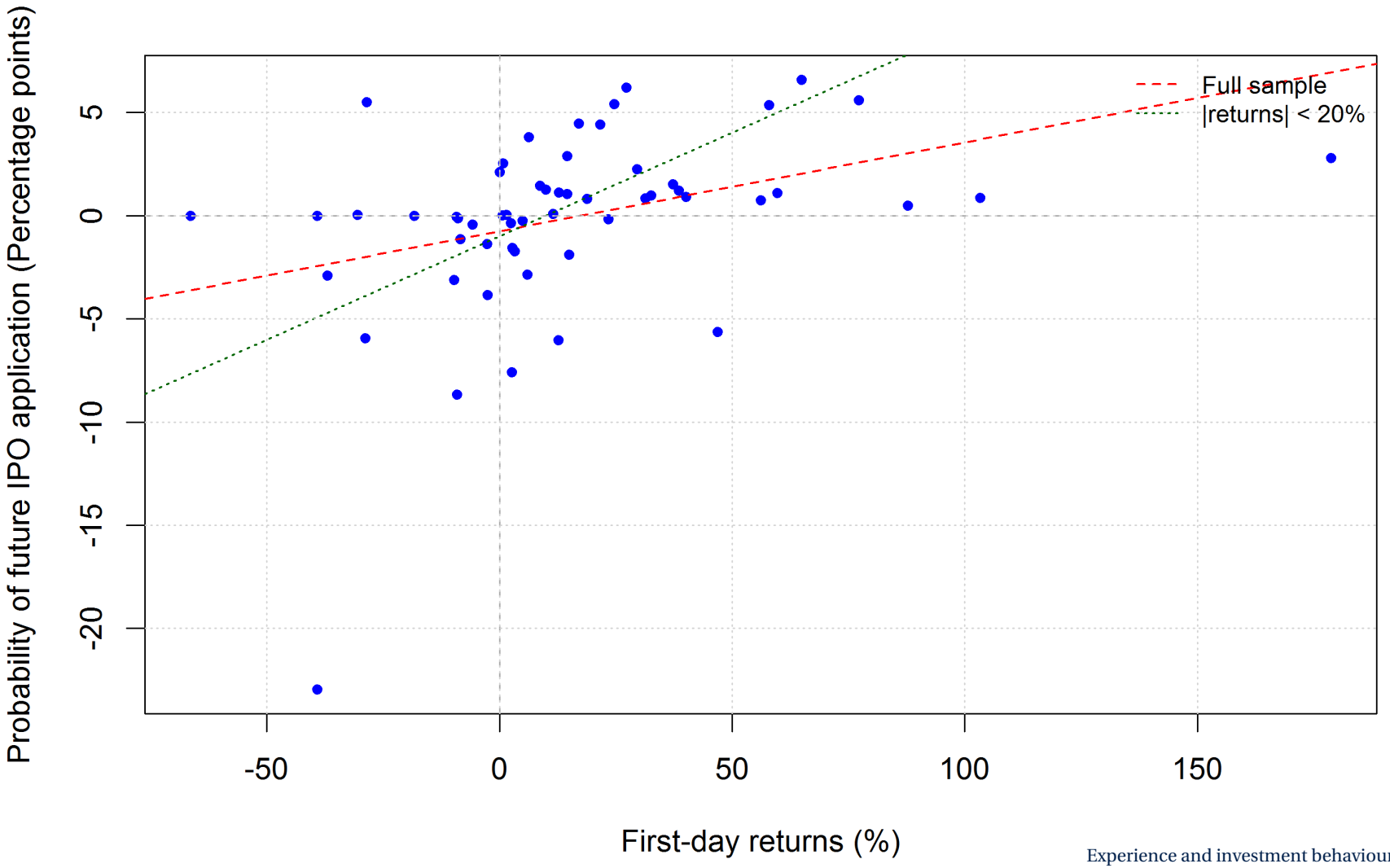
Experience effect on disposition

y_{ijc} =Disposition (Non-IPO security)



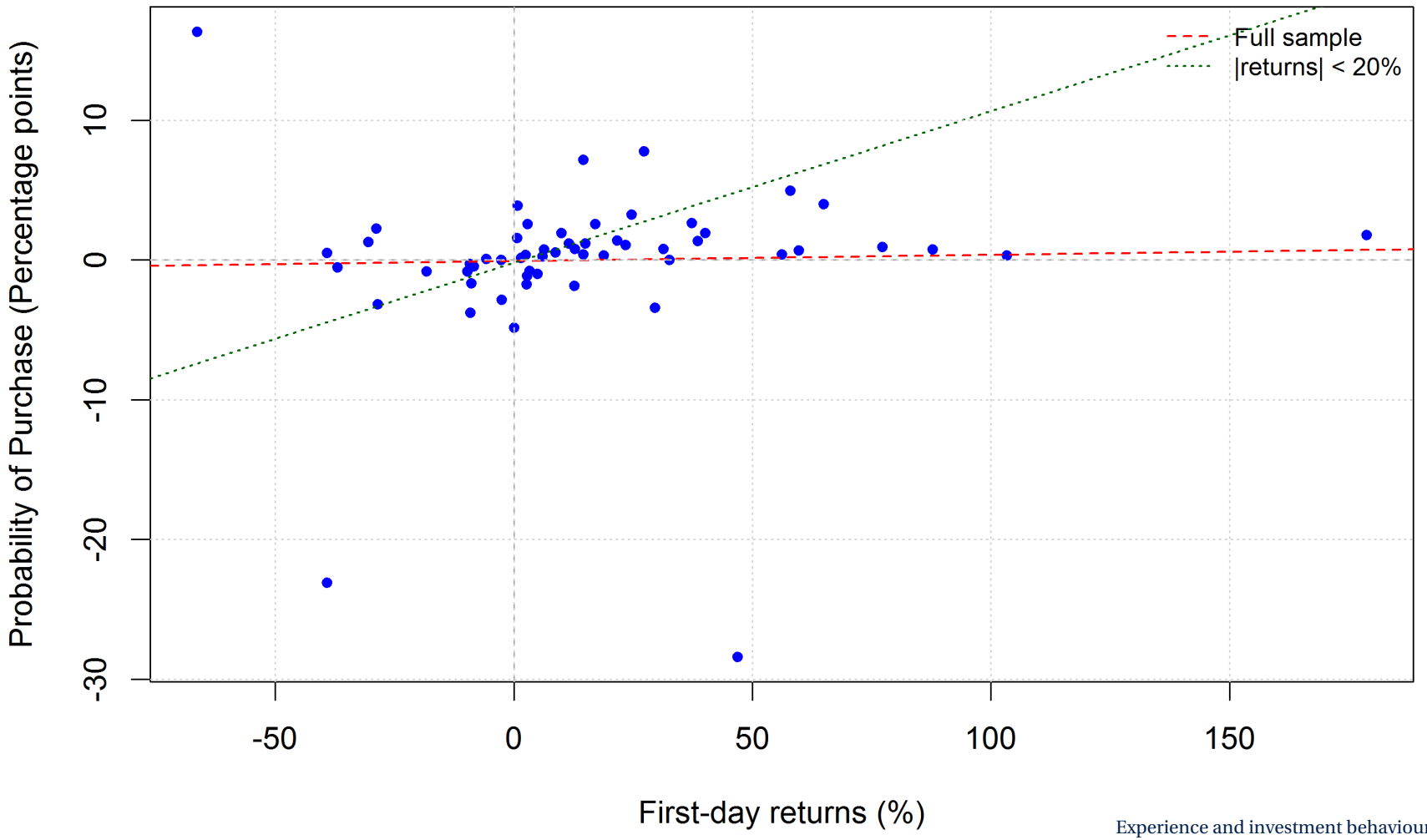
Effects across IPOs

$y_{ijc} = I(\text{No. of applications to future IPO} > 0)$



Effects across IPOs

$y_{ijc} = I(\text{Purchase activity in the market} > 0)$



Conclusion

- Using exogenous variation in experience, confirm strong effects on a range of investor behaviours.
  - Effects on trading behaviour (turnover) suggests belief channel is important.
- Next steps:
  - Heterogeneous treatment effects on large and small accounts to explore risk aversion effects (preferences).
  - Heterogeneous treatment effects on type of bid to explore optimism effects (beliefs).
  - Explore variation across IPOs to further understand what types of experience matter most (information).
- Aggregation: While we have treated effects as atomistic, 1.7 million investors with an average 1% effect size can affect equilibrium.