

THE PROMISES AND PITFALLS OF ROBO-ADVISING

Francesco D'Acunto
Nagpurnanand Prabhala
Alberto G. Rossi



ROBO-ADVISING

What is robo-advising? Why is it useful?

Our study

- Setting

- Impact on investors

 - Risk, return, trading

 - Unexpectedly, behavioral biases

- Impact on brokerage firm

Takeaways

HOUSEHOLD FINANCIAL PLANNING

A complex problem to frame and solve

Liquidity planning

Tax planning

Housing and mortgages

Credit card debt

Insurance

Investments — wealth management, retirement

Compounded by financial literacy issues

FINANCIAL ADVICE

Lots of room for advice in any *one* of these

Liquidity planning

Tax planning

Housing and mortgages

Credit card debt

Insurance

Investments — wealth management, retirement.

Advising is human-intensive, fragmented, targeted at wealthy.

FINTECH ADVISING B2B, B2C

ROBO-ADVISOR

BUSINESS-TO-CONSUMER (B2C)



BOTH B2B & B2C



BUSINESS-TO-BUSINESS (B2B)



ROBO-RETIREMENT

B2C



B2B



B2B & B2C



PORTFOLIO MANAGEMENT

B2C



B2B



FINANCIAL SERVICES SOFTWARE

B2B



MICRO-INVESTING

B2C



INVESTING TOOLS

B2C



B2B & B2C



B2B



DIGITAL BROKERAGE

B2C



B2B



WHAT IS ROBO-ADVICE?

Automated advice

Same information as available to human, but algorithmic

Why automate using algorithms?

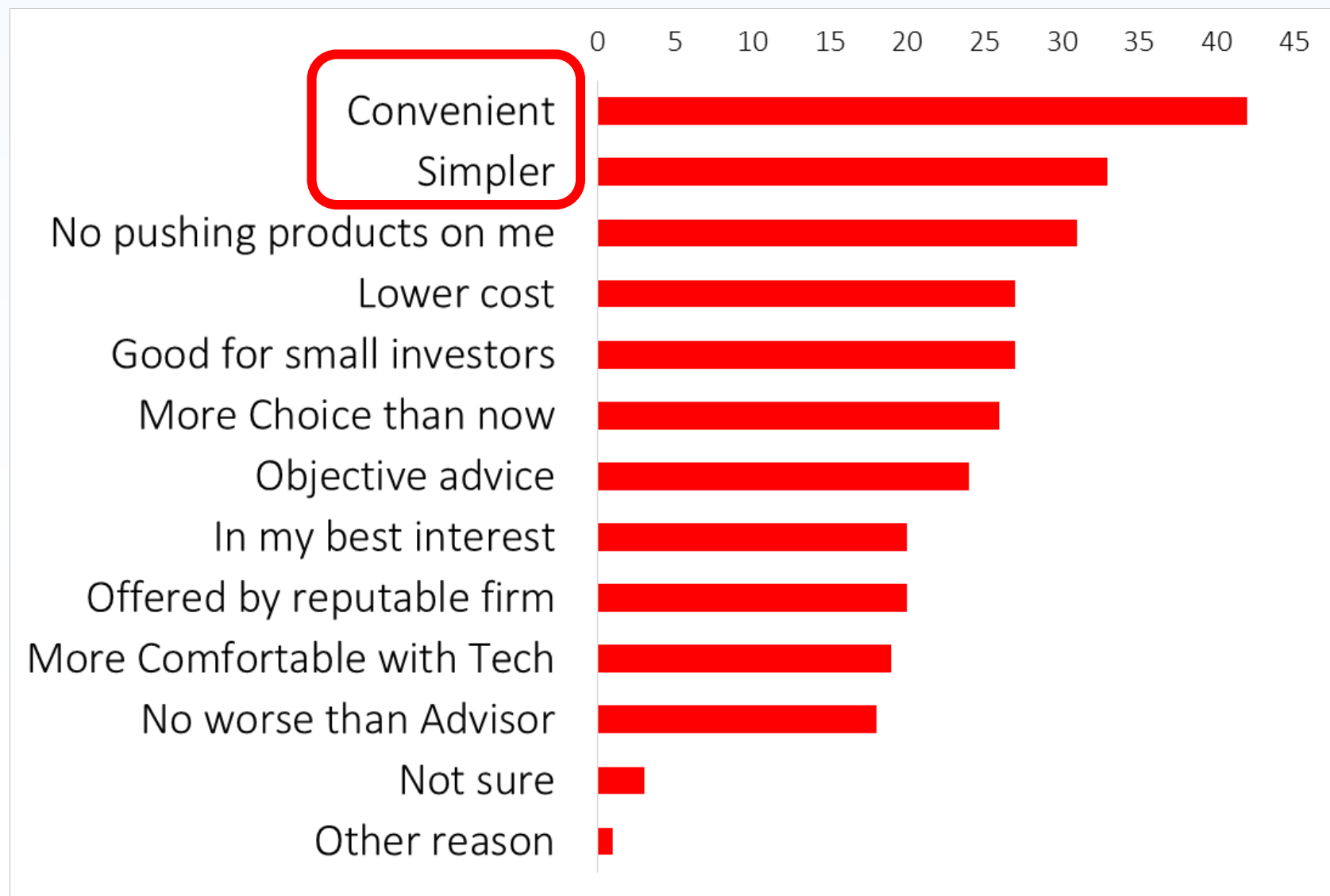
Cheaper, allows greater reach

Easy execution — a click implements advice

Not subject to advisor conflicts and biases

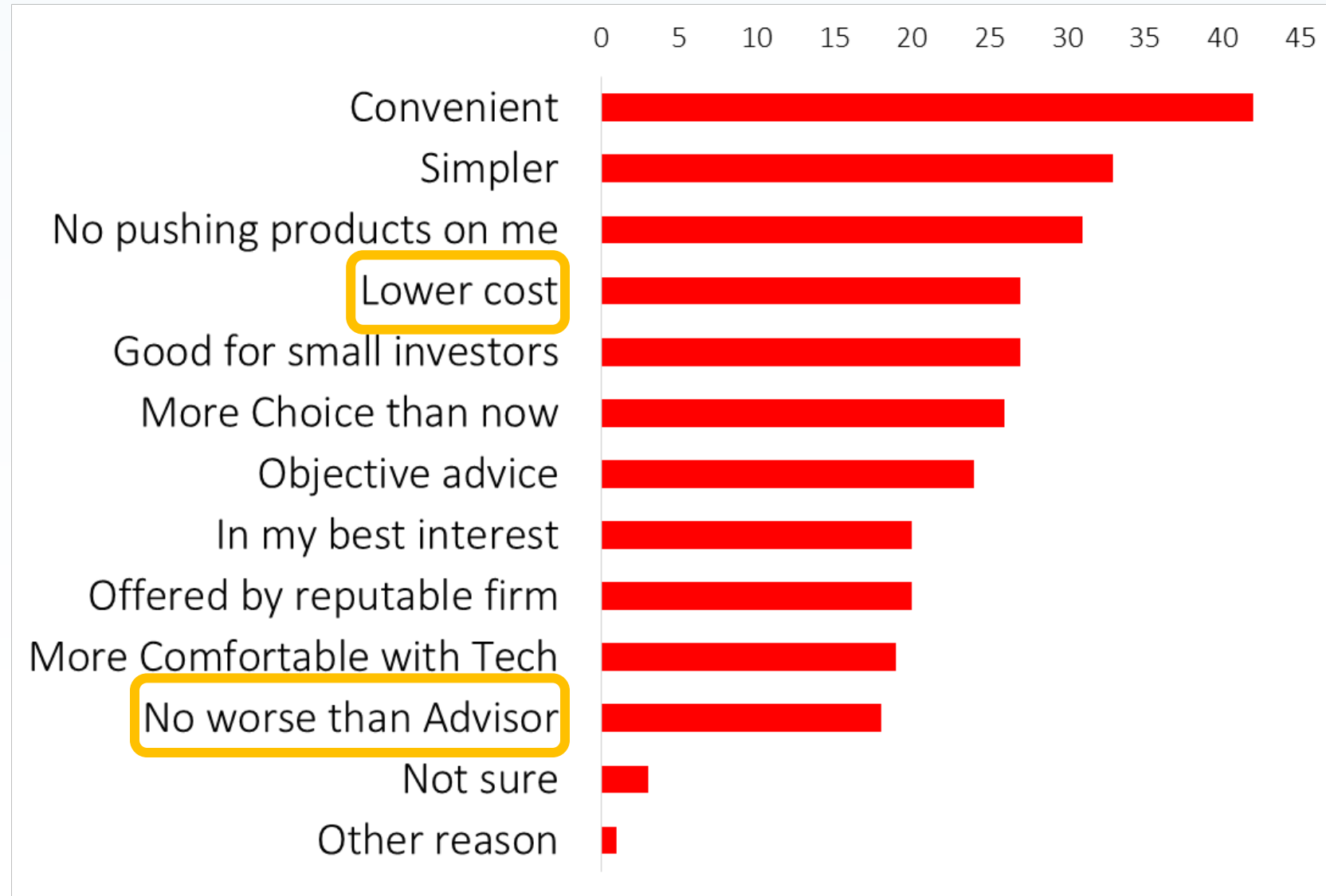
Does this work? What are its effects?

WHY DO CLIENTS VALUE ROBO-ADVICE?



Source: BlackRock, *Investor Pulse 2015*

WHY DO CLIENTS VALUE ROBO-ADVICE?



Source: BlackRock, *Investor Pulse 2015*

ROBO-ADVISING FOR RETAIL INVESTORS

Most investors are not financially savvy

- They do not know how to invest their money

- They make systematic mistakes and display behavioral biases

Financial advisors are expensive, might be biased

Robo-advising potentially helpful

- Cheap and easy to use

- But, does one size fit all with robo-advising?

OUR SETTING

A large full-service brokerage house in India

800,000+ retail accounts

In July 2015, they introduced a **Portfolio Optimizer Tool**

obtains existing portfolio holdings from account

performs Markowitz mean-variance optimization

proposes optimal weights, depicts outcomes

single-click execution if desired by investors.

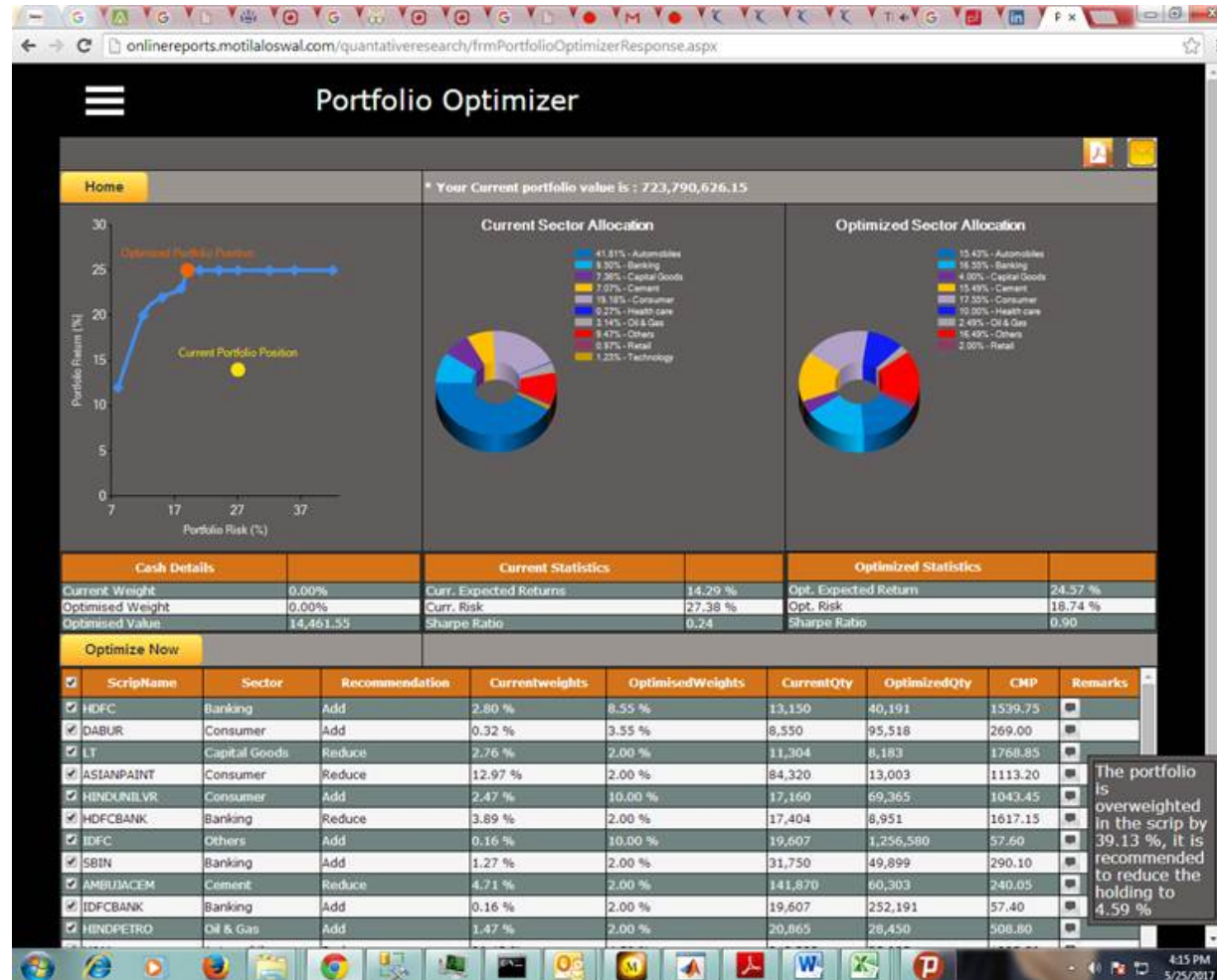
weights as determined by investors

OUR SETTING

ROBO-ADVISING FOR RETAIL INVESTORS

Obtain existing holdings from portfolio

Maximize, analyze & button to execute

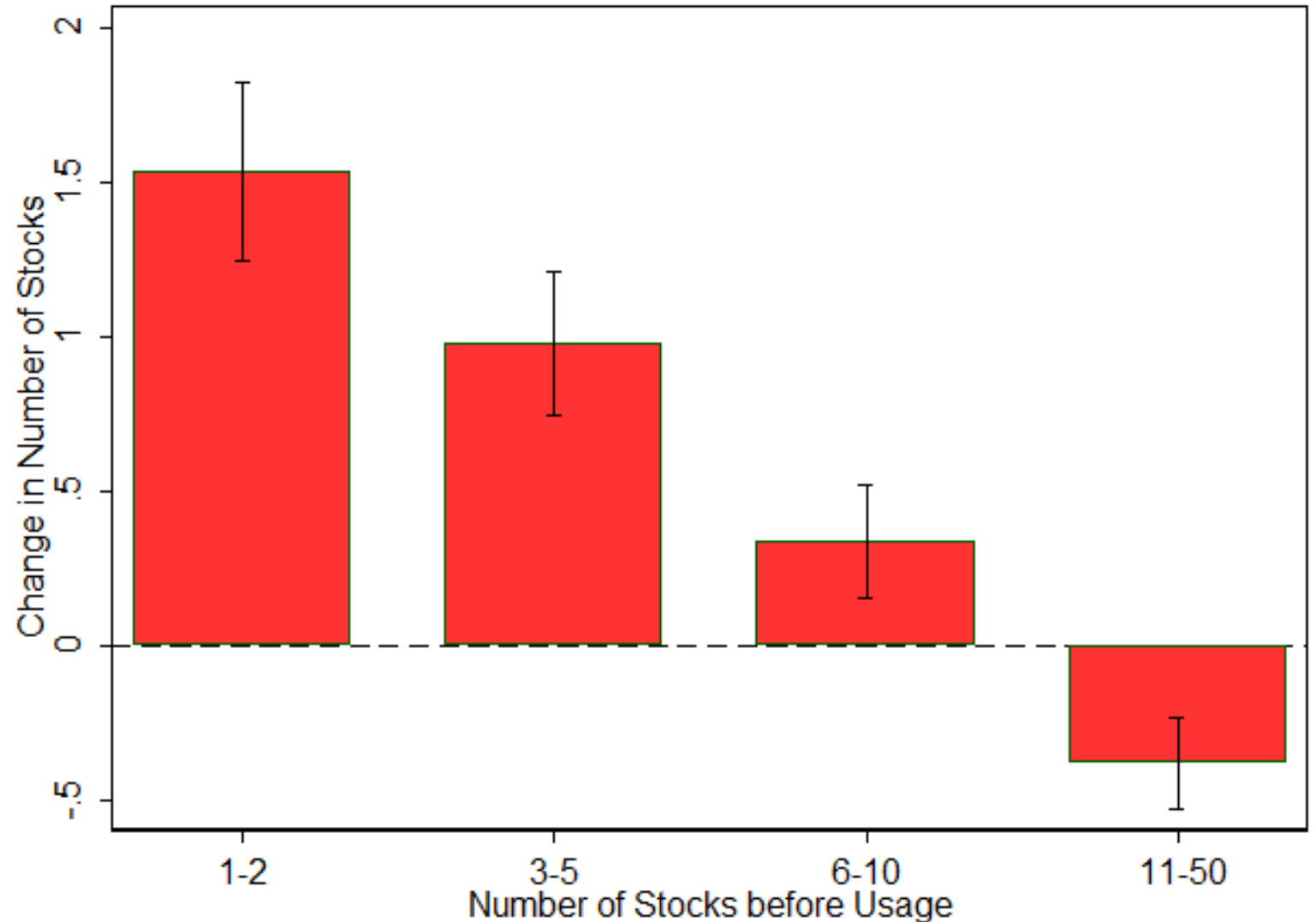


ROBO-ADVISING & DIVERSIFICATION

NUMBER OF STOCKS HELD

Investors **less diversified** before usage increase the size of their portfolio by **more than 80%**

Those diversified before usage do not change (if anything, less stocks)

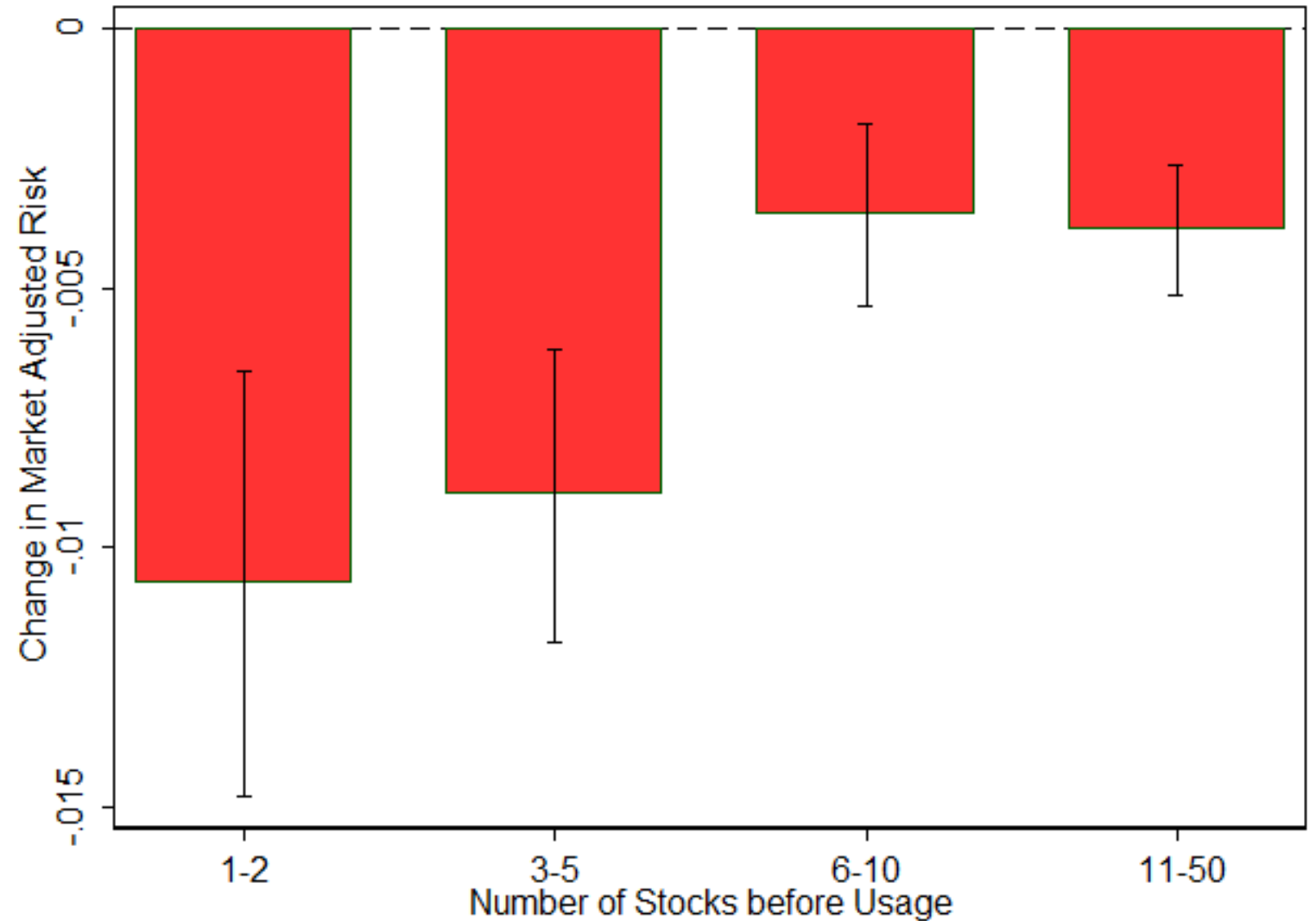


ROBO-ADVISING & DIVERSIFICATION

PORTFOLIO VOLATILITY

Investors **less diversified** before usage decrease the risk of their portfolio by **more than 50%**

Those diversified before usage have barely lower volatility after usage

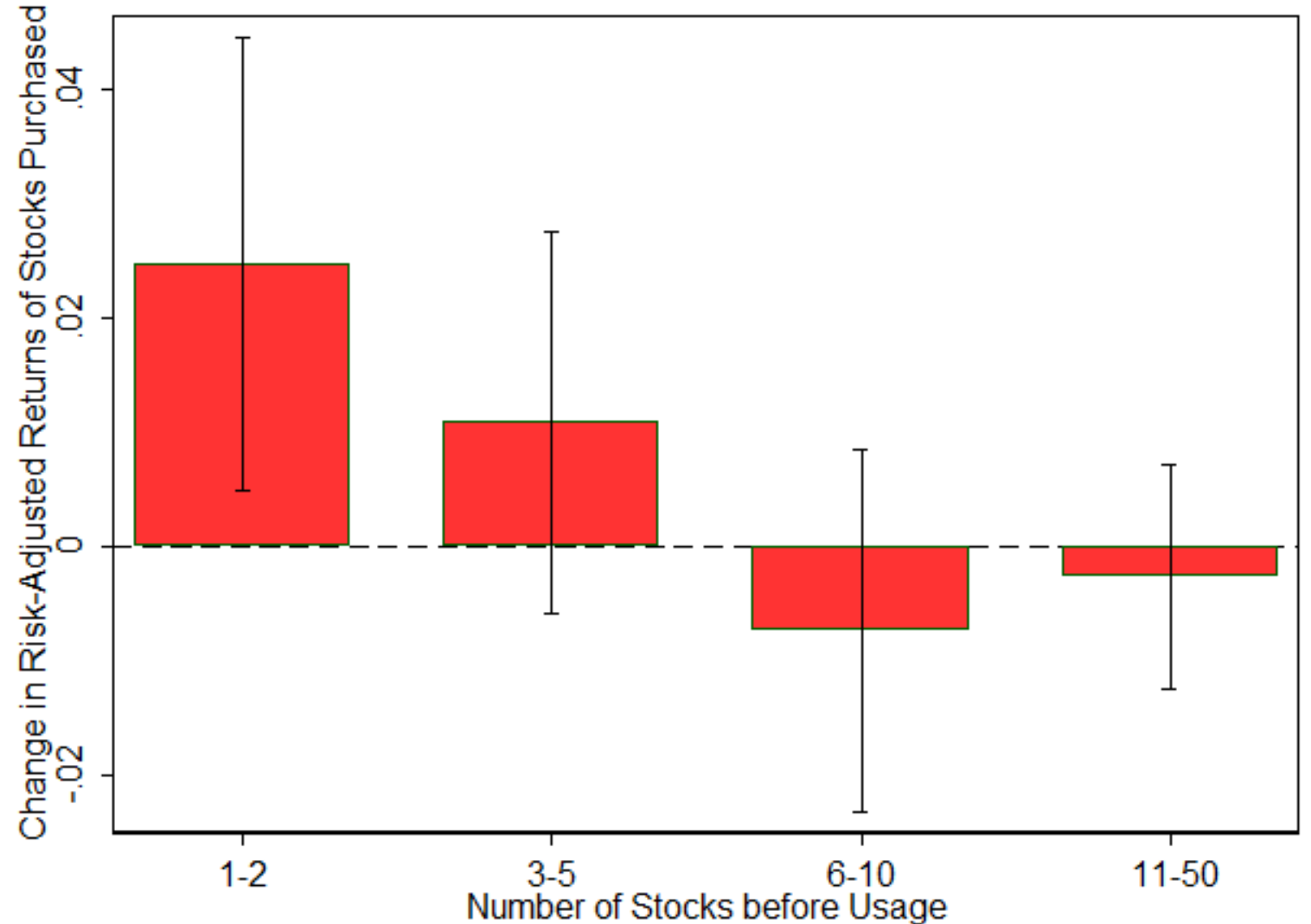


ROBO-ADVISING & PERFORMANCE

INVESTMENT RETURNS

Investors **less diversified** before usage also perform **better trades** on average

Those diversified before usage have similar performance

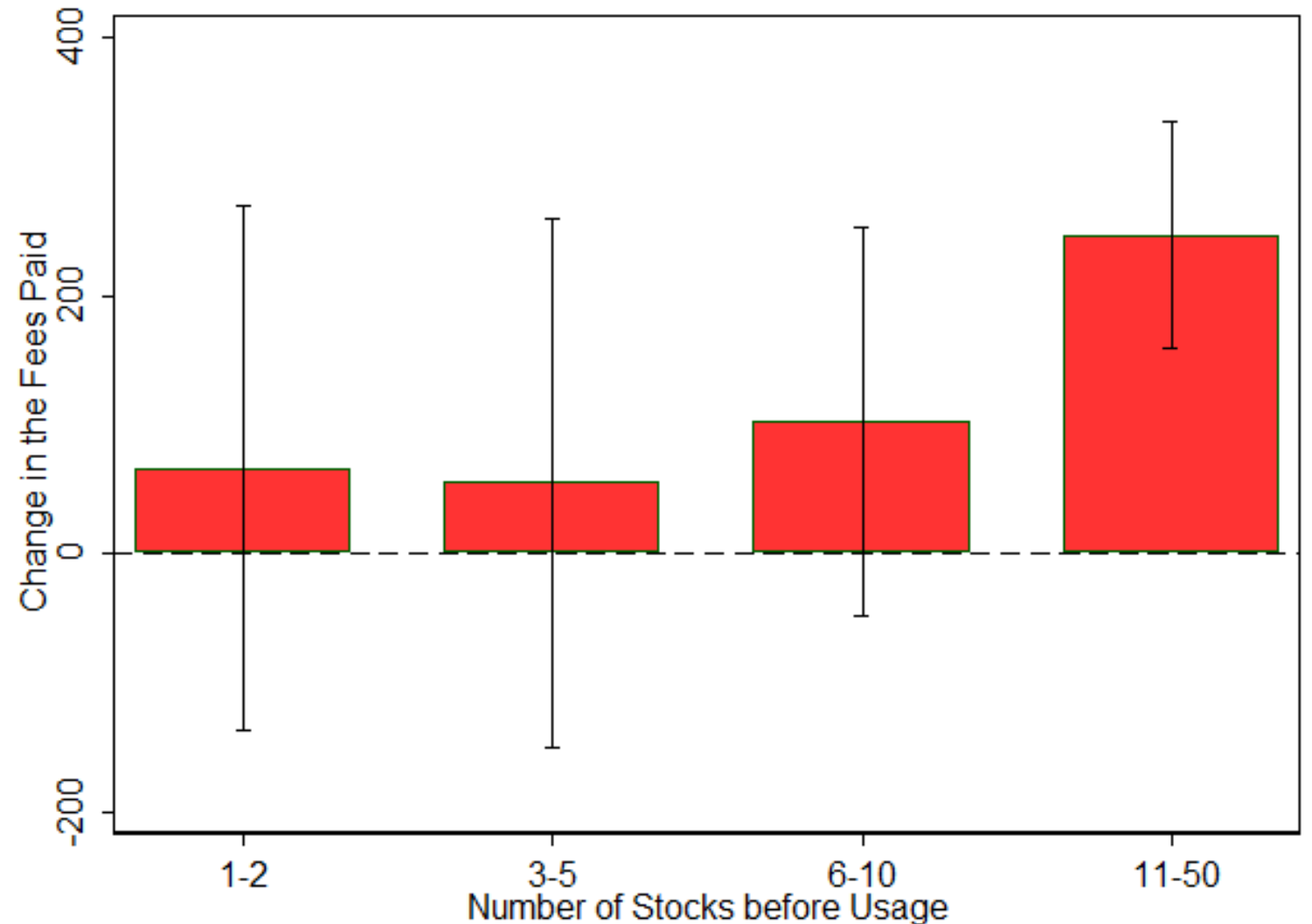


ROBO-ADVISING & PERFORMANCE

FEES PAID

Investors **most diversified** before usage pay much **higher fees** overall

They **trade more** even if no better performance. They use the optimizer too often



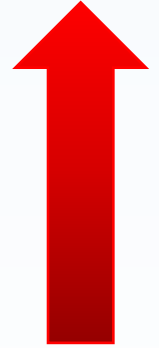
GAINING AND LOSING WITH ROBO-ADVISING

Least sophisticated
Investors

Higher diversification

Higher Performance

No Change in Fees

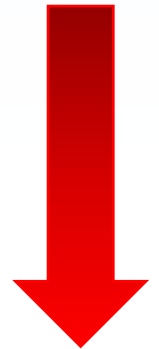


Most sophisticated
Investors

Lower diversification

No Change in Performance

Higher Fees Paid



WHAT'S IN IT FOR THE SOPHISTICATED?

Behavioral biases affect all investors, including sophisticated investors

Disposition Effect

do not sell loser stocks when should, sell gaining stock when should not

Trend Chasing

purchase stocks that gained recently to “ride the wave”

Rank Effect

sell stocks in portfolio with extreme returns

WHAT'S IN IT FOR THE SOPHISTICATED?

Behavioral biases affect all investors, including sophisticated investors

Disposition Effect

do not sell loser stocks when should, sell gaining stock when should not

Trend Chasing

purchase stocks that gained recently to “ride the wave”

Rank Effect

sell stocks in portfolio with extreme returns

Biases decline for EVERYBODY in our setting
Causal identification — missed calls versus calls picked up

SO WHAT?

WHY ROBO-ADVISING IS IMPORTANT

So far, two views of intervention on individual decision-making

LIBERTARIANISM

No intervention

Everybody knows better
for themselves

LIBERTARIAN PATERNALISM

Give a Default
(Richard Thaler, “Nudge”)

We know better
than everybody

SO WHAT?

WHY ROBO-ADVISING IS IMPORTANT

Robo-advising with voluntary uptake helps overcome *algorithm aversion*

(Dawes, 1979)

LIBERTARIANISM

No intervention

Everybody knows better
for themselves

ROBO-ADVISING

Explain best choice,
easy implementation

Ultimate active choice
is the investor's

LIBERTARIAN
PATERNALISM

Give a Default
(Richard Thaler, "Nudge")

We know better
than everybody

WHAT ABOUT THE BROKERAGE HOUSE?

A flood of robo-advisors in the market now.

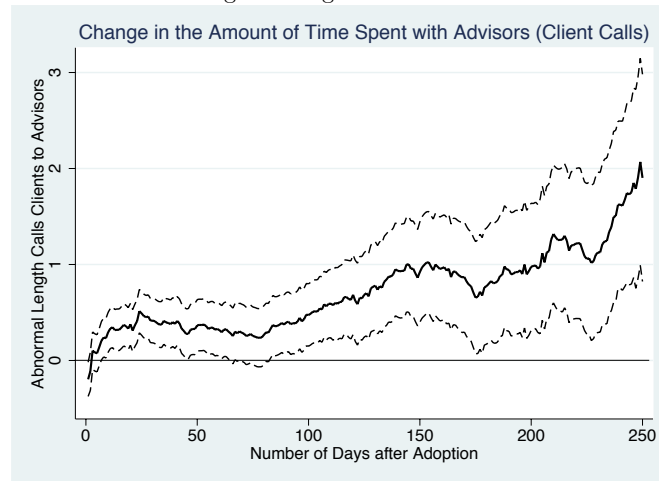
Will the demand for human advisors decrease?

Old North State Trust, LLC (2017) says “... we don’t expect robots to ... put us out of business.”

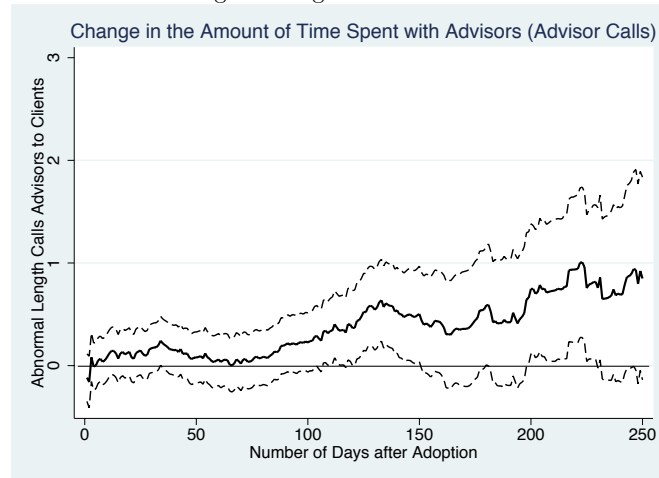
Humans are more willing to trust machines for *objective* decisions, e.g., Netflix, Amazon. They trust driverless cars less even if safer and lose trust in algorithms quicker (Hosanagar and Cronk, 2016)

Demand for human advising when robo-advising is introduced

Panel A. Change in Length of Client initiated Calls



Panel B. Change in Length of Advisor initiated Calls



WHAT ABOUT THE BROKERAGE HOUSE?

A flood of robo-advisors in the market now.

Will the demand for human advisors decrease?

Old North State Trust, LLC (2017) says “... we don’t expect robots to ... put us out of business.”

Humans are more willing to trust machines for *objective* decisions, e.g., Netflix, Amazon. They trust driverless cars less even if safer and lose trust in algorithms quicker (Hosanagar and Cronk, 2016)

Treating investors with robo-advising *increases* the demand for human advising, and probably, the type of advising. We are fleshing out these results with more detailed data on interactions between investors and advisors.

THE PROMISES AND PITFALLS OF ROBO-ADVISING

Francesco D'Acunto
Nagpurnanand Prabhala
Alberto G. Rossi

