Report on Bachelor / Master Thesis

Institute of Economic Studies, Faculty of Social Sciences, Charles University

Student:	Jakub Hromčík
Advisor:	PhDr. Jiří Schwarz, PhD.
Title of the thesis:	Reaction of retail investors to financial market movements and sentiment changes

OVERALL ASSESSMENT (provided in English, Czech, or Slovak):

Short summary

The thesis explores how various sociodemographic attributes influence what risks retail investors take compared to robo-advised levels of risk and how these attributes affect the level of their investment activity. Specifically, Jakub focuses on the difference between male and female investors.

The following hypotheses are studied:

Hypothesis 1 : Women are more likely to follow the recommendations of a robo-advisor when choosing a portfolio.
Hypothesis 2 : There is a significant difference between the sexes in ETFs investment volume adjustments during periods of high market volatility.

Both hypotheses are clearly described, motivated, and linked to the previous research.

The main contribution of the thesis is the studied topic of robo-advisory combined with a special kind of investment product offered to retail investors - ready-made portfolios and their recommendations prepared by algorithms based on the investors' characteristics.

The author collected a unique dataset from a Czech brokerage firm. The methodology used is appropriate for the hypotheses stated above. The level of the methods used more than corresponds to the author's level of studies.

The results are described and discussed well, though large parts of these sections are mechanical/technical descriptions of the results presented in the tables.

To summarize, the quality of the thesis is satisfactory. Below, I outline a couple of points for improvement or topics for further discussion.

Contribution

The author studies the topic of retail investment, which has gained a lot of popularity and importance in the last few years. The author claims that he is the first to study sociodemographic attributes' effect on investors' susceptibility to invest in ready-made portfolios suggested by robo-advisors. I can confirm that I haven't found any papers that explore this link, at least not in a similar scope or context.

The contribution of the thesis lies also in the type of assets explored - ETFs, or ready-made portfolios composed of ETFs - which haven't been extensively studied before. This is important because these instruments are traded heavily, for example, through mobile apps whose usage has exploded over the recent years. The focus on ready-made portfolios suggested by algorithms is what I find especially innovative.

The contribution could have been enhanced further by improving the thesis, e.g., by implementing some of the suggestions from this report.

Methods

In Chapter 4, Jakub describes the dataset. The data is proprietary. Hence, e.g., the source of the data can't be provided. Nevertheless, the data is described sufficiently enough. What I especially liked was

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the section that compared the characteristics of the retail investors to Czech populational characteristics. I would perhaps only appreciate more detail about cleaning the dataset, as manipulation with individual observations is always tricky.

I would like to see more discussion about why the robo-advisor recommends portfolio III (medium-low risk) so often to the investors. This plays a crucial role in the analysis and greatly affects the results of testing the first hypothesis and their interpretation. The data suggest that the goals of most investors are of a long-term nature, and therefore, investors should naturally be willing to take more risks. It is, therefore, surprising to me that the platform would recommend a rather conservative portfolio to more than 40% of users. Isn't it maybe a default recommendation in case the algorithm is missing some input from the user?

When describing the computation of the riskiness of a mix of portfolios, the author writes, *"If a person chose more portfolios, we calculated the average portfolio by taking the mean of the levels of all chosen portfolios."* I suggest taking a weighted average where the weights correspond to the amount invested in each individual portfolio. This is a standard approach in finance. However, I assume it would have a minimal impact on the results.

As an extension to the first model (testing Hypothesis 1), it would be interesting to show the effect of interactions, e.g., whether the studied link between taking a higher-than-recommended risk and sex changes with the investor's age, etc.

Regarding the second hypothesis, it wasn't clear to me whether making a deposit equals making a trade on the given platform. Or is there some other step/confirmation from the user needed before the deposit becomes an investment? Clarifying this would make some parts of the text more understandable.

The threshold of VIX = 30 chosen to determine periods of high volatility seems quite arbitrary. Perhaps a more rigorous way would be to make it more data-dependent, e.g., using the 95th quantile of daily VIX readings in the past year. On that note, why is it even necessary to use the dummy variable *Volatile* instead of the VIX levels as such?

I applaud the author for his effort to verify that the regression assumptions hold. It is not a common practice to publish the verification process in such detail, and most researchers settle with simply stating that the model assumptions are considered to be satisfied.

The results of regressions testing both hypotheses are provided. The author accompanies the results with further tests and statistics and comments well on all the relevant figures. Some of the most crucial points are discussed in more detail in Chapter 6, together with robustness checks.

There are minor inaccuracies in the interpretation of the results. For example, the author claims that *"On the other hand, in a month subsequent to that which experienced high volatility (V IX > 30), individuals are expected to decrease their deposits by 2,400 CZK.",* while the dependent variable is total volume, i.e., the author actually speaks about deposits and withdrawals combined.

Literature

The literature review section summarizes the most important contributions in the fields of behavioral economics and retail investing. It begins with an overview of advances in behavioral economics, providing many examples of biases and how they are being studied. Later, the focus shifts towards the influence of sociodemographic characteristics on retail investing. The whole section is organized very

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well and cites papers with high relevance. It is relatively short, but I feel it covers what is needed, so I appreciate the brevity.

Manuscript form

Jakub structures his thesis in a standard way. It is written in a clear, understandable manner. Reading it would be easier if it was less about mechanical/technical descriptions and if more emphasis was put on the story. But that's a difficult discipline, so I won't deduct points for that. Below, I have several minor technical comments about what could be improved.

Several typos occurred in the text, e.g. *ivnestors*, or *Woolridge*.

The thesis proposal is mentioned as part of the content, but it's missing.

There is a large amount of blank space before Table 4.3, which could've been avoided.

Section 4.3 about summary statistics could've been split into more subsections. This would avoid, e.g., the sudden change in the flow of information going from the comparison of the characteristics of the retail investors to Czech populational characteristics straight into details about the portfolio recommendation and selection process.

As a reader, I don't consider putting NA values into bar charts/histograms a good choice when the underlying variable is of a numeric nature, i.e., other choices can be ordered. The examples are Figures 4.1 and 4.2, which confused me because I had mistaken the NA column for the most risky portfolio.

Because the data and methodology sections are rather large and fragmented, the text would perhaps be more easily digestible if both were described in their own separate chapters.

The figures and tables displayed have a standard academic format. The same holds for citations. The tables may use more information in the descriptions below them.

The formulas aren't numbered, and thus, no links are utilized to refer the reader, e.g., to the regression specifications. I had to scroll up and down and find the equations several times while examining the results. Numbering the equations and referencing them in the paragraphs would make it easier to understand everything.

Overall evaluation and suggested questions for the discussion during the defense

The thesis is very original, well-organized, and understandable. The methods and presentation are of good quality. I have many, but primarily minor, reservations or comments which I've summarized above.

The results of the Turnitin analysis do not indicate significant text similarity with other available sources. The thesis fulfills the requirements for a bachelor thesis at IES, Faculty of Social Sciences, Charles University, Hence, I recommend the thesis for the defense and suggest a grade B.

SUMMARY OF POINTS AWARDED *(for details, see below):*

CATEGORY	POINTS

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Contribution	*(max. 30 points)*	28
Methods	*(max. 30 points)*	24
Literature	*(max. 20 points)*	20
Manuscript Form	*(max. 20 points)*	15
TOTAL POINTS	*(max. 100 points)*	87
GRADE	**(A – B – C – D – E – F)**	B

NAME OF THE REFEREE: Lukas Petrasek

DATE OF EVALUATION: 14.1.2024

*Digitally signed by
Lukas Petrasek
(14. 1. 2024)*

_____
Referee Signature

EXPLANATION OF CATEGORIES AND SCALE:

CONTRIBUTION: *The author presents original ideas on the topic demonstrating critical thinking and ability to draw conclusions based on the knowledge of relevant theory and empirics. There is a distinct value added of the thesis.*

METHODS: *The tools used are relevant to the research question being investigated, and adequate to the author's level of studies. The thesis topic is comprehensively analyzed.*

LITERATURE REVIEW: *The thesis demonstrates author's full understanding and command of recent literature. The author quotes relevant literature in a proper way.*

MANUSCRIPT FORM: *The thesis is well structured. The student uses appropriate language and style, including academic format for graphs and tables. The text effectively refers to graphs and tables and disposes with a complete bibliography.*

Overall grading:

TOTAL	GRADE
91 – 100	A
81 - 90	B
71 - 80	C
61 – 70	D
51 – 60	E
0 – 50	F