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Personalized Robo-Advising: Enhancing Investment through Client Interactions

Abstract: Automated investment managers, or robo-advisors, have emerged as an alternative to traditional financial advisors. The viability of robo-advisors crucially depends on their ability to offer personalized financial advice. We introduce a novel human-machine interaction framework, in which the robo-advisor solves an adaptive mean-variance portfolio optimization problem. The risk-return tradeoff dynamically adapts to the client's risk profile, which depends on idiosyncratic characteristics as well as on market performance and varying economic conditions. Stochastic variation in the client's risk aversion process produces an intertemporal hedging demand for the risky asset, which we obtain explicitly. We characterize the optimal level of personalization in terms of a tradeoff faced by the robo-advisor between receiving client information in a timely manner and mitigating the effect of behavioral biases in the risk profile communicated by the client. We argue that the optimal portfolio's Sharpe ratio and return distribution improve if the robo-advisor counters the client's tendency to reduce portfolio risk during economic contractions, when the market risk-return tradeoff is more favorable. (joint work with Sveinn Olafsson and Thaleia Zariphopoulou).

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