

Progress report on “How do people perceive the effect of algorithms and automation on returns to stocks and cryptocurrencies?” by Christopher Rauh

Investing has become more accessible than ever before, thanks to advancements in technology and the proliferation of investment options. Today, investors have a plethora of choices, including selecting stocks themselves, using a robo-advisor, investing in mutual funds, or cryptocurrencies. Each of these investment avenues comes with unique advantages and disadvantages, and the perceived returns on investment can vary widely between them. This research aims to compare the perceived returns to investment of choosing stocks oneself, using a robo-advisor, investing in a mutual fund, or cryptocurrencies.

Investing in individual stocks can offer investors a sense of control and the potential for higher returns if they can identify undervalued or high-growth companies. However, this approach requires a considerable amount of time, effort, and expertise in analyzing financial statements, assessing market trends, and making informed investment decisions.

On the other hand, a robo-advisor can offer a more passive investing approach, where an algorithm-driven platform makes investment decisions based on an investor's risk tolerance, investment goals, and financial situation. Robo-advisors are typically more affordable than human advisors, and they offer a diversified portfolio of investments, helping investors mitigate the risks associated with investing in individual stocks.

Mutual funds provide a diversified portfolio of stocks or other assets managed by professional fund managers, which can provide investors with exposure to a broader range of investment opportunities than investing in individual stocks. Additionally, mutual funds typically require less time and expertise to manage than selecting stocks oneself, making them an attractive option for investors who want to take a more hands-off approach to their investments.

Cryptocurrencies, such as Bitcoin, have become increasingly popular as an investment option due to their potential for high returns and their decentralized nature. However, investing in cryptocurrencies can be highly speculative and volatile, which may not be suitable for all investors.

Overall, investors choose different investment options based on their investment goals, risk tolerance, financial situation, and level of expertise. It is essential to evaluate the potential risks and rewards associated with each investment option before making an investment decision. Since individuals are exposed to very different information sources and life events, they might hold very different beliefs about how different asset classes will evolve in the future.

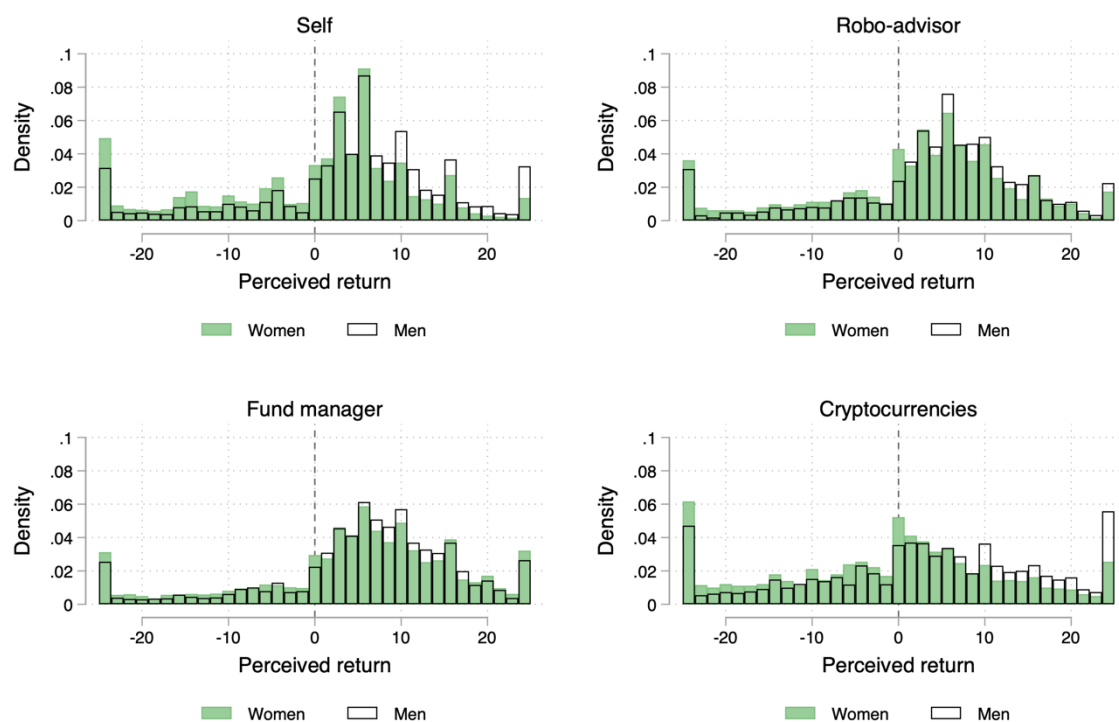
In order to shed light on these questions, I design a survey to elicit perceived returns to investments in different asset classes through a professional survey company. I collect responses from more than 7,000 respondents in the US representative of the labor force aged 25-54. Summary statistics are presented in Table 1. Respondents are asked about their perceived returns to different forms of investments within the next twelve months.

Table 1: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
University degree	7481	.52	.5	0	1
Woman	7481	.5	.5	0	1
Age	7481	39.887	8.281	25	54
Log earnings	7467	7.699	1.154	0	19.782
Chooses stocks	7481	.324	.468	0	1
Invests in mutual fund	7481	.136	.343	0	1
Uses robo-advisor	7481	.065	.41	0	5
Invests in crypto	7411	.255	.436	0	1
Perceived returns to stocks	7461	102.159	11.838	75	125
Perceived returns to mutual fund	7453	103.231	11.411	75	125
Perceived returns to robo-adviso	7455	105.398	11.409	75	125
Perceived returns to crypto	7442	100.71	13.731	75	125

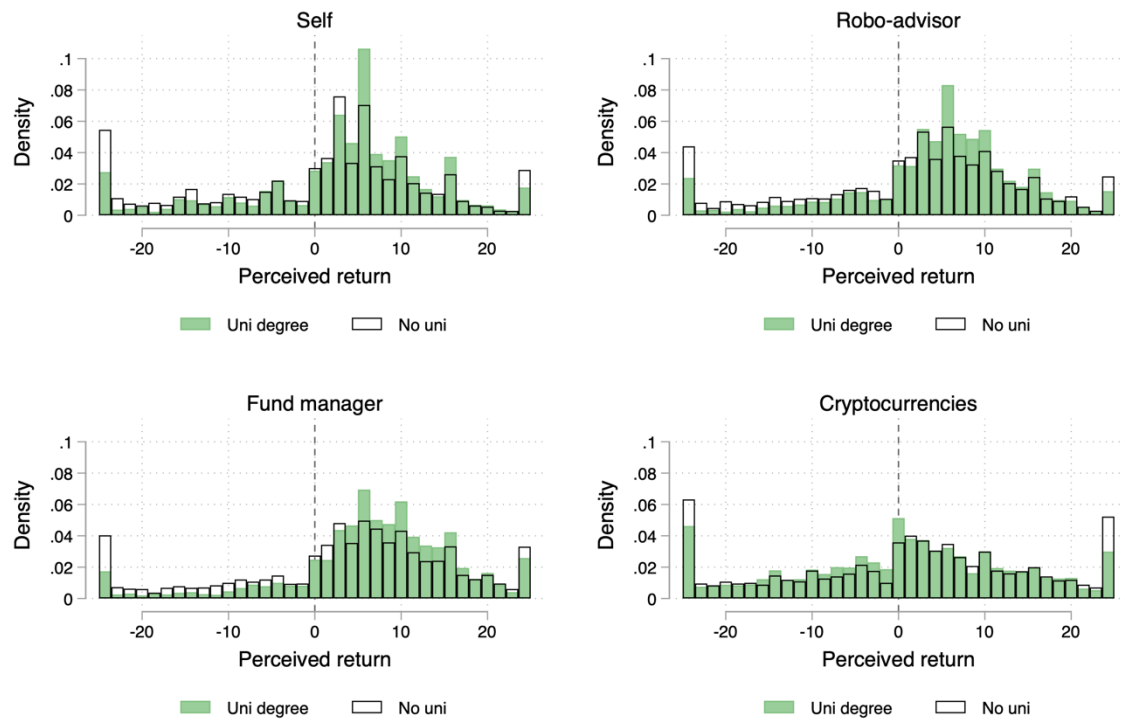
Figures 1 and 2 present the perceived returns by sex and education for the four separate modes of investments separately. We see that men tend to have higher perceived returns for all investment methods, in particular at the top end of the distribution. This is most visible for the perceived return to cryptocurrencies.

Figure 1: Distribution of perceived returns by sex



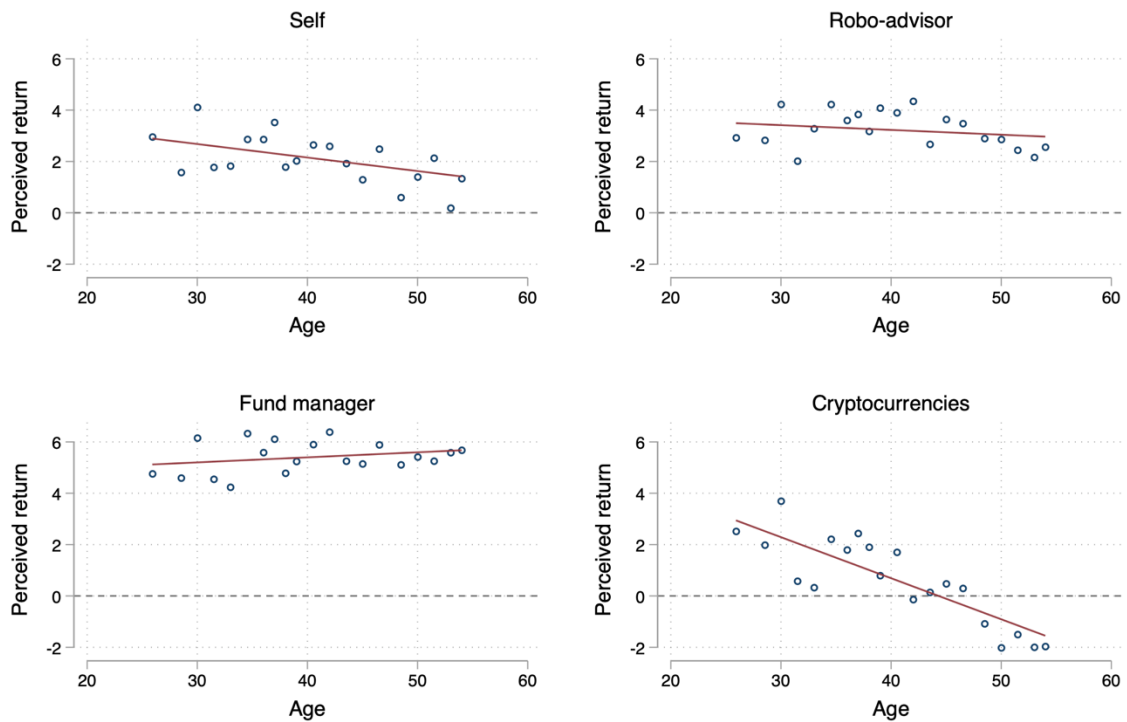
In Figure 2 we see the distributions by level of education. Respondents with no university education tend to have more polarized perceived returns with both more extreme high and low perceived returns.

Figure 2: Distribution of perceived returns by education



In Figure 3 we can see a binned scatter plot of the perceived returns in percentage points with the corresponding regression line by age. The top left quadrant shows the perceived returns to respondents choosing stocks themselves, the top right to investments chosen by a robo-advisor, the bottom left to returns generated by a fund manager, and the bottom right to cryptocurrencies.

Figure 3: Average perceived returns to different forms of investment and assets by age of respondent



Several patterns emerge. First, perceived average returns are highest for investments chosen by professional fund managers, which are around 5% and only show a slightly increasing perceived return by age. Perceived returns to cryptocurrencies, however, on average are lower and show a strong negative gradient by age. Older respondents on average actually expect the returns to be negative.

In Table 2 I look at whether individuals hold similar perceived returns across the four investment methods. The correlations ranging from 0.39 to 0.65 suggest that they are fairly high.

Table 2: Correlation between perceived returns

Variables	(1)	(2)	(3)	(4)
(1) Return on stocks	1.000			
(2) Return using robo-advisor	0.490	1.000		
(3) Return using fund manager	0.480	0.655	1.000	
(4) Return on cryptocurrency	0.436	0.433	0.390	1.000

In Table 3 I regress perceived returns for each of the four investment methods on individual characteristics. In column (1) one can see that college graduates perceive returns to choosing stocks themselves to be 1.9 percentage points (pp) higher than those without a college degree. Women perceive the returns to be 2.7 pp lower. However, it also becomes clear that personality traits are highly correlated with perceived returns to own

investments. Those that are one standard deviation more open to try new activities perceive returns to be 0.8 pp higher. In columns (2)-(4) we see that similar patterns seem to hold for perceived returns to the other investment methods. What stands out is that for those that consider themselves well organized, which reflects conscientiousness, have higher perceived returns for own investment but lower perceived returns for investments using a robo-advisor or when investing into cryptocurrencies.

Table 3: Explaining perceived returns

	(1) Self	(2) Roboadvisor	(3) Fund_manag er	(4) Cryptocurren cies
College graduate	1.923*** (.276)	1.998*** (.273)	2.525*** (.272)	-.94*** (.32)
Woman	-2.653*** (.279)	-1.414*** (.276)	-.329 (.275)	-2.704*** (.324)
Risk Taking	.652*** (.063)	.399*** (.062)	.443*** (.062)	.891*** (.073)
Patience	.134** (.054)	.04 (.054)	.065 (.054)	.222*** (.063)
Try new activities	.791*** (.161)	.052 (.16)	.056 (.159)	.881*** (.187)
Organized	.237* (.141)	-.258* (.139)	-.071 (.139)	-.463*** (.164)
Center of attention	.403*** (.146)	.166 (.145)	.146 (.144)	.558*** (.17)
Comforting	-.13 (.141)	.499*** (.14)	.679*** (.139)	.467*** (.164)
Worrier	.078 (.14)	.499*** (.139)	.508*** (.138)	.201 (.163)
Age	-.015 (.016)	.001 (.016)	.043*** (.016)	-.108*** (.019)
log(Earnings)	.692*** (.122)	.687*** (.121)	.796*** (.12)	.39*** (.142)
Constant	-6.98*** (1.235)	-5.087*** (1.225)	-6.667*** (1.218)	-2.87** (1.436)
Observations	7448	7440	7442	7429
R-squared	.086	.035	.043	.085

Standard errors are in parentheses

*** $p < .01$, ** $p < .05$, * $p < .1$

Further I find that perceived returns are highly predictive of whether the respondent engages in the corresponding form of investment. In Table 1 I regress a binary variable of whether someone engages in a given form of investment on the corresponding perceived return. For choosing stocks themselves and investments in cryptocurrencies the elasticity is larger than one, i.e. a one percent increase in perceived returns increases the likelihood of choosing stocks themselves or investments in cryptocurrencies by more than one percentage point.

Table 2: Predicting investment activity

	(1)	(2)	(3)	(4)
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	Self	Robo- advisor	Fund- manager	Crypto- currencies
Perceived return	1.311*** (.043)	.16*** (.035)	.213*** (.042)	1.21*** (.034)
Constant	.296*** (.005)	.131*** (.004)	.054*** (.005)	.247*** (.005)
Observations	7461	7453	7455	7373
R-squared	.11	.003	.004	.145

Standard errors are in parentheses

*** $p < .01$, ** $p < .05$, * $p < .1$