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ABSTRACT

Using a unique sample of retail impact investors, this study evaluates how investors deal with the challenge of aligning their financial and their nonfinancial goals. We find that investors with stronger nonfinancial motives are more likely to expect the overperformance of an impact investment and the underperformance of traditional equity and bond investments than investors with weaker nonfinancial motives. This cross-asset relationship between nonfinancial motives and expected performance indicates that investors form expectations that fit with the investment decisions that their nonfinancial motives are likely to motivate. We also find that after experiencing losses, investors with stronger nonfinancial motives are less likely to revise their expectation that the impact investment will underperform and more likely to expect that the impact investment will overperform than other investors. Our findings provide further evidence that preferences can affect expectations, and challenge conclusions drawn from observed behavior regarding investors' willingness to pay for impact.

1. Introduction

The recent growth of sustainable investing offerings has raised questions as to what generates a demand for such products. Previous studies suggest that the demand for sustainable investments is driven by financial as well as nonfinancial motives (Riedl and Smeets, 2017; Hartzmark and Sussman, 2019). In particular, impact investment products claim to cater to investors who aim to achieve both financial and nonfinancial goals at the same time (Höchstädter and Scheck, 2015). Many investors, however, find it challenging to pursue two different goals by the same means (Borgers and Pownall, 2014; Caseau and Grolleau, 2020; Lee et al., 2020). As a consequence, many investors fail to choose investment portfolios that achieve financial and social outcomes efficiently, and thus may waste opportunities for value creation (Lee et al., 2020).

This study uses a unique sample of retail impact investors based in Switzerland to evaluate how impact investors deal with the challenge of aligning their financial and their nonfinancial goals. Impact investors are particularly prone to facing this challenge due to the very definition of impact investing. In contrast to other sustainable investing strategies, impact investing is explicitly defined by the duality of nonfinancial and financial investment goals that it allows investors to pursue (Kölbel et al., 2020; Hockerts et al., 2022; Wilkens et al., 2023). Nonfinancial

goals are thus much more clearly included in investors' motivations for impact investing than they are for other sustainable investing strategies.

To explore how impact investors align their financial and nonfinancial goals, we examine the existence of a specific strategy that the impact investors may use when investing in assets with a different capacity of serving the nonfinancial goals of the investors. Specifically, we examine whether impact investors hold performance expectations that are directed towards their nonfinancial goals. Exploring differences between the nonfinancial motives of the impact investors, we find that those with stronger nonfinancial motives are more likely to expect overperformance by the impact investment and underperformance by the equity investments than do investors with weaker nonfinancial motives. This cross-asset class difference in the relationship between nonfinancial preferences and performance expectations indicates that investors form financial expectations that fit with the investment decisions that their nonfinancial preferences are more likely to motivate. Moreover, we find that investors with different nonfinancial preferences deal differently with the challenges that losses represent to their expectations. Investors with stronger nonfinancial motives are less likely to revise their expectation that the impact investment will underperform and more likely to expect overperformance than investors with weaker nonfinancial motives.

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Block et al. (2021) show that there are considerable differences among impact investors with respect to how they make investment decisions. We use the variation in the strength of impact investors' non-financial motives to make several contributions to the literature that investigates the behavior of investors with nonfinancial preferences.

First, we contribute to the literature on motivated reasoning (Krizan and Windschitl, 2009; Kunda, 1987) and wishful thinking (Krizan and Windschitl, 2007) by documenting similar effects in the judgement behavior of real investors in the domain of impact investing. In line with one important observation from this literature – namely, that people are often prone to arrive at conclusions and to form beliefs that they find desirable or comforting – we find that stronger non-financial motives correlate with more favorable expectations regarding the financial performance of those investment alternatives that these nonfinancial motives are likely to support in the first place. By adopting more favorable expectations regarding the impact investment and less favorable expectations regarding equities offering higher returns, investors with stronger nonfinancial motives reduce potential tensions that the simultaneous pursuit of financial and nonfinancial goals may create.

Second, our results contribute to the literature on how investors respond to information on the sustainability characteristics of investments. While previous research finds that sustainability characteristics could be a liability when comparing products (Chernev, 2007; Pancer et al., 2017; Newman et al., 2014), other researchers suggest that sustainability characteristics can cause a halo effect. Consistent with the literature on the halo effect, our findings provide additional evidence that the strength of a halo effect in the perceived financial attractiveness of assets depends on individual nonfinancial motives and preferences, just as is found in other decision-making tasks (Chernev and Blair, 2021; Haws et al., 2014).

Third, we contribute to the literature that evaluates the drivers of the return and risk expectations of sustainable investors. Using a combination of survey data and real portfolio holdings, Riedl and Smeets (2017) find that return expectations are only marginally related to the probability of holding a socially responsible investment. More recent research challenges these findings however. In an experimental setting, Hartzmark and Sussman (2019) find that the allocation to a sustainable investment option significantly increases the performance that investors expect to achieve with that investment. Similarly, using more recent survey data and portfolio holdings, Giglio et al. (2023) find a positive correlation between the share of sustainable funds and the return expectations for these investments. More importantly, they show that even investors with ethical considerations hold optimistic financial expectations. Also, Engler et al. (2023) report that there is a positive relationship between the expected returns on sustainable assets and the shares of sustainable investments in their portfolios. Overall, more recent evidence thus indicates that investors holding sustainable assets are optimistic regarding the financial performance of their investments. We extend this line of research by exploring differences in the nonfinancial preferences of these investors and showing that the strengths of these preferences are significantly related to these investors' expectations regarding the performance of traditional and of sustainable assets. This sheds more light on the question of where the expectations of sustainable investors come from.

Fourth, we contribute to the scarce literature on whether motivated beliefs can be sustained in the face of evidence that require their revision. We find that when experiencing losses with an impact investment, investors with stronger nonfinancial motives are less likely to revise their expectations that the impact investment will underperform and more likely to expect that the impact investment will overperform than other investors. This provides further support to previous findings that motivated beliefs can sustain challenges posed by the receipt of negative feedback (Zimmermann, 2020).

Finally, the question of how investors with nonfinancial motives behave is important to the furtherance of our understanding of whether

investors are willing to pay to achieve impact (Gutsche et al., 2020; Apostolakis et al., 2018). We find that stronger nonfinancial motives are associated with stronger risk-adjusted return expectations, while experience of losses is associated with significantly lower risk-adjusted return expectations. These observations suggest that the observed willingness to pay for impact – as found, for instance, by Barber et al. (2021) – may be driven by motivated beliefs that can sustain a certain amount of pressure exerted in the form of negative feedback and not necessarily only by preferences. Moreover, the documented association between nonfinancial motives and risk-adjusted return expectations suggests that there is an alternative channel via which affect may influence decisions that operate through expectations, in addition to the one suggested by Heeb et al. (2022) that operates through effects related to preferences, such as “warm glow”.

The question of the willingness to pay for impact is closely related to the discussion regarding the utility function of investors with non-financial preferences (Utz et al., 2014, 2015). While this discussion considers only the instrumental value of expectations, our results show that expectations and nonfinancial motives are not independent of each other. In other words, our findings allow us to conclude that nonfinancial motives can affect investment decisions not only because they represent an additional source of utility but also because they can trigger an alternative motivational channel through the way in which investors form more favorable expectations with respect to the financial prospects of their sustainable investments. This channel can potentially explain the observation that investors tend to postpone selling sustainable investments after experiencing losses (van Dooren and Galema, 2018).

2. Theoretical background

Sustainable investments allow investors to express their attitude with regard to social investment criteria (Statman, 2004). Investors may, however, experience difficulties when making financial decisions while simultaneously taking into account their nonfinancial preferences (Borgers and Pownall, 2014). As a consequence, individuals may fail to choose investment portfolios that achieve financial and social outcomes efficiently, and thus may waste opportunities for value creation (Lee et al., 2020). More broadly speaking, such investors can increase the overvaluation of firms relative to what is recognized to be their true value in efficient financial markets (Bofinger et al., 2022).

From a psychological perspective, the strategy of pursuing two ambitious goals might be perceived as diluting the effectiveness of pursuing each individually (Caseau and Grolleau, 2020; Pilditch et al., 2019). For example, Chernev (2007) finds that consumers perceive a product that specializes in a single attribute as superior with regard to that attribute relative to an all-in-one product that is described by a combination of features, even when performance with regard to the attribute in question is exactly the same for both products. This tendency to draw compensatory inferences has been attributed to consumer reliance on the zero-sum heuristic (Chernev, 2007), reflecting the belief that the available options must be balanced in terms of their overall performance. Several consumer research studies have advanced the notion that consumers often view environmental friendliness as a drawback vis-à-vis other product characteristics, such as effectiveness or functionality (Pancer et al., 2017; Newman et al., 2014).

By analogy, with regard to sustainable investing investors may judge intuitively that resources invested in one dimension (e.g., producing an impact on nonfinancial issues) are matched by an equivalent lack of resources invested in other dimensions (e.g., the financial return). Indeed, Barber et al. (2021) estimate that investors expect lower returns from impact fund investments ex ante compared to traditional venture capital funds. It is also possible that the expectations of impact investors are additionally affected by image effects—so, investors do not want to appear greedy by profiting from the poor (O'Donohoe et al., 2010;

Ariely et al., 2009; Scheck et al., 2016) and may desire a financial return only if their social target is not achieved (Chowdhry et al., 2019).

These apparent behavioral implications of following two ambitious goals are, however, challenged by the implications of other research that suggests that investors' evaluation of the individual dimensions of an investment can be biased by the holistic impression of that investment, an impression that may generate a halo effect (Finucane et al., 2000). For example, Chernev and Blair (2015) find that corporate philanthropy is likely to generate a benevolent halo that spills over into evaluations of the company's products. Similarly, Lee et al. (2013) observe that in the context of food consumption, simply believing that processed food is organic improves enjoyment of its taste, influences caloric estimations, and increases the amount people are willing to pay for it. Further, Hong and Liskovich (2015) find that people take the fact that a firm cares about the environment and overextrapolate, believing the firm itself is valuable and offers great products.

The halo effect has been found even among prosecutors in the US, where, according to Hong and Liskovich (2015), companies with higher corporate social responsibility metrics pay lower fines for employing bribes. Moreover, firms tend to benefit from their corporate responsibility even when corporate irresponsibility is increasing (Walker et al., 2016).

Regarding the origins of halo effects, prior research suggests that they can be the result of decisions driven by affect (Slovic et al., 2007; Finucane et al., 2000). For example, Alhakami and Slovic (1994) find that a favorable (unfavorable) attitude motivates decision-makers to judge related activities as having high (low) benefits and low (high) risks. In the context of sustainable investing, Hartzmark and Sussman (2019) suggest that affect may influence sustainable investors' assessments, such that funds with higher sustainability ratings are expected to have higher returns but also lower risk. This implied inverse return-risk relationship in the assessments of investors has been observed also in other investment domains (Sokolowska and Sleboda, 2015; Ganzach, 2000; Shefrin, 2001).

Further research exploring the drivers of the halo effect suggests that the effect is related to predispositions and previous decisions. For example, Chernev and Blair (2021) find that the degree to which the notion of sustainability is aligned with consumers' environmental values influences their beliefs about the product performance of a company that signals pro-social behavior. Similarly, Haws et al. (2014) find that individuals with stronger green consumption values evaluate the non-environmental attributes of green products more favorably. In a similar vein, Kuhnen and Knutson (2011) show that positive emotions (e.g., excitement) affect financial decision-making and may cause investors to be confident about their own ability to evaluate different investment options.

The present paper extends this line of research and evaluates whether an effect similar to the halo effect can also be observed in the context of impact investment decisions. In particular, we evaluate whether a potential effect is related to the strength of the investors' nonfinancial motives. The latter could affect investors' expectations if they seek consistency between their preferences and their beliefs (Carpenter, 2019). Since people are more likely to alter or bend their expectations to coincide with their preferences than vice versa (Granberg and Brent, 1983), impact investors may engage in some sort of wishful thinking (Krizan and Windschitl, 2007), as observed in the context of other decisions. For example, Babad (1997) finds that people's preferences for political candidates are potent predictors of their expectations vis-à-vis the winner, and Olsen (1997) finds that there is a positive correlation between the estimated probability of the occurrence of economic events and their level of estimated desirability.

Finally, since previous research has shown that beliefs motivated by preferences might still be sustained in the face of feedback (Zimmermann, 2020), we evaluate whether investors with stronger nonfinancial motives adjust their expectations differently when experiencing losses than investors with weaker nonfinancial motives.

3. Data and measurement

3.1. Data

We conducted a survey of private retail investors drawn from the investor base of a microfinance development fund (Oikocredit Deutsche Schweiz (OCDS)). Microfinance, also called financial inclusion, is one of the main forms of impact investment (Scola et al., 2018). Impact investments explicitly pursue both financial and social goals simultaneously. Thus, they transcend conventional organizational forms that maximize only one of either financial gain (i.e., invest in profit-maximizing businesses) or social welfare (i.e., support social welfare-maximizing charities).

We invited about 2000 impact investors (the complete address book of the OCDS fund based in Switzerland) to participate in our survey, which took paper-and-pencil form with a free return envelope included. Participation was thus voluntary, not incentivized, and anonymous. We received 721 responses, which corresponds to a response rate of more than 36 percent. The survey was conducted in 2017, when sustainable investing had emerged as a prominent topic in Switzerland. At the time, there was no consensus in the academic literature and among the broader public on the question of how sustainable investments perform relative to other investments that could potentially have influenced the assessments of our participants. Impact investors could also easily distinguish between their financial and nonfinancial goals as at that time the overlap between impact investments and other sustainable investment strategies was limited.

3.2. Measurements and descriptive statistics

Our main dependent variables are the expected return and expected risk potential of three asset classes. Return expectations were evaluated with the following question: "On a scale from 1 (very low) to 5 (very high), how do you assess the risk potential of the following investments?" The investments considered are "equities/equity funds", "bonds/bond funds", and "investment in Oikocredit". The risk expectations with regard to the same investment categories were evaluated with a similar question: "On a scale from 1 (very low) to 5 (very high), how do you assess the return potential of the following investments?" We used the expected return-risk ratio calculated based on each respondent's answers to assess the perceived attractiveness of each asset class from an investment point of view. The advantage of this ratio is that it allows a comparison between asset classes with different return-risk profiles.

We use three different asset classes as each of them is expected to attract investors with different nonfinancial preferences. Due to the nature of the impact fund in our study, the return-risk profile of the impact investment is very similar to that of bonds, while equities have in general a higher return and a higher risk. An asset with a return-risk ratio that is greater (smaller) than 1 indicates that investors expect that the asset will overperform (underperform). This reflects the perceived attractiveness of the asset from a financial point of view.

Over the available estimates for all asset classes (N=1628), about 44% indicate fair performance estimations (return potential equal to risk potential), in about 30% of the cases investors expect underperformance, and in 26% of the cases they expect overperformance. Among the estimates for equities (N=531), about 43% of all estimations reflect a fair estimation, about 37% reflect expectations for underperformance, and about 20% reflect expectations of overperformance. Among the estimates for bonds (N=502), about 48% reflect a fair estimation, about 33% reflect underperformance, and about 19% reflect overperformance. For the impact investment (N=595), about 41% of the estimations indicate a fair performance, about 20% reflect underperformance, and about 39% reflect overperformance. Hence, the proportion of estimates indicating underperformance is the highest for equities and the lowest for the impact investment, and the proportion of

estimates indicating overperformance is lowest for equities and highest for the impact investment. These differences in the distributions of performance expectations across asset classes are statistically significant (Pearson $\chi^2(4) = 77.7$; p -value: 0.000).

To assess the financial and nonfinancial motives of investors we use the question, “On a scale from 1 (not important) to 5 (very important), how would you rate the importance of the following goals for your decision to invest in Oikocredit?” And the following goal categories: “Achieve an attractive investment return”, “Maintain the value of my investment”, “Minimize investment losses”, “Achieve diversification”, “Support the goals of Oikocredit”, “Achieve social–environmental impact”, “Support the democratic model of Oikocredit”, and “Invest according to my values”. Using principal component analysis (PCA) on the participants’ ratings, we find that the variance in responses can be captured by two components (with eigenvalues of 2.74 and 2.28, respectively). These two factors explain 62.8% of the variance in the responses.¹ After applying an orthogonal varimax rotation, two factors with clear variables’ loadings remain. We use the loadings of the variables that entered each component to build two indices. One of the two contains a high load on the motives “Achieve an attractive investment return” (74.7%), “Maintain the value of my investment” (83.8%), “Minimize investment losses” (82.8%), and “Achieve diversification” (65.1%). We use this index as a proxy for the importance of “financial motives”. The other index contains high loadings on the following motives: “Support the goals of Oikocredit” (85%), “Achieve social–environmental impact”(88%), “Support the democratic model of Oikocredit”(67%), and “Invest according to my values” (5%). We use this index as a measure of the “nonfinancial motives” of our respondents.

We use the indices as independent variables in our analysis. To facilitate a more meaningful interpretation of the estimation results, we use the median of the corresponding indices to distinguish between investors with strong financial, respectively nonfinancial, motives and investors with weak financial, respectively nonfinancial, motives.

To measure investment experience as a potential determinant of return and risk expectations, we use the question “With which of the following asset classes have you made losses in the past?” with the categories “Equities/equity funds”, “Bonds/bond funds”, “Derivatives/structured products”, “Oikocredit investment”, and “Other sustainable investments”. We base our measure of investment experience on past investment returns, based on evidence that such experience affects expectations and investment behavior (Malmendier, 2021). Moreover, such experience can potentially challenge beliefs motivated by preferences (Zimmermann, 2020). We use the answers to the question to build dichotomous variables reflecting experience with losses with each asset class. About 47% of all respondents report having experienced losses with equity investments. Losses with bonds are reported by 17% of the respondents, and about 15% of the respondents report having experienced losses with the impact investment.

We also measure experience with the impact investment as a potential determinant of performance expectations. To do so, we ask respondents, “For how many years have you had Oikocredit investments?” There are five possible answers to this question: “Less than one year”, “1–5 years”, “5–10 years”, “10–15 years”, and “More than 15 years”. In our sample, only 5% are new investors (holding the impact investment for less than one year). About 17% are investors who have held the impact investment for 1 to 5 years and about 29% have held the impact investment for 5 to 10 years. About 26% have held the impact investment for 10 to 15 years and about 24% for more than 15 years. To avoid difficulties in the estimation procedure due to lack of diversity in the dependent variable within each category, the first two categories are merged and treated as one.

¹ The third and fourth factors have eigenvalues of 0.74 and 0.65, respectively.

Other control variables capture individual characteristics such as sex, age, and income level. Sex is evaluated with two categories (male and female). In our sample, around 50% report that they are male. Age is measured using four categories: “Under 30 years”, “30–49 years”, “50–69 years”, and “70 years or older”. Less than 1% of all respondents are under 30 years old. About 14% are between 30 and 49 years old. The majority (46%) are between 50 and 69 years old, and about 39% of the respondents are 70 or older. To avoid difficulties with the estimation procedure due to lack of diversity in the dependent variable within each category, the first two categories are merged and treated as one.

For the level of income, we refer to the annual gross household income (before taxes and deductibles). We use five categories around the long-term median income in Switzerland. Only about 4% of all participants report having an income of less than CHF 30,000. About 41% report an income of “CHF 30,000–80,000”, and about 36% report an income of “CHF 80,001–120,000”. About 17% of all investors report an income of “CHF 120,001–500,000”, and less than 0.5% report an income of “More than CHF 500,000”. To avoid difficulties in the estimation procedure due to lack of diversity in the dependent variable within each category, the last two categories are merged and treated as one.

3.3. Estimation procedure and robustness tests

The dependent variable in our analysis is the perceived attractiveness of different asset classes from an investment point of view, as reflected in the perceived return–risk ratio. A ratio greater (smaller) than 1 indicates that the investors expect that the asset will overperform (underperform).

Naturally, the return–risk ratio calculated with our measurements of return and risk is bounded. This makes the use of standard linear regression models not useful. To make the interpretation of results more meaningful, in the main analysis, we consider three ordered categories depending on whether the return–risk ratio is smaller than, equal to, or greater than one. In the robustness analysis, this treatment of the dependent variable is relaxed.

The main independent variable is the index of nonfinancial motives. To facilitate a more meaningful interpretation of the estimation results, we use the median value of the index to distinguish between investors with strong and with weak nonfinancial motives. The same categories are applied to the index of financial motives, which is used as a control variable. In the robustness analysis, this treatment of the indices is relaxed.

In the main analysis, we use ordered logit (OL) and generalized ordered logit (GOL) estimations (Peterson and Harrell, 1990; Williams, 2006) to evaluate the impact of the independent variables on the ordered return–risk ratio. In the GOL estimations, the proportional odds assumption is relaxed for the variables that violate it. Relaxing the proportional odds assumption is important, as its violation may lead to biased estimates. Additionally, relaxing this assumption is important as the effect of the independent variables may be asymmetric—for example, just because an increase in a variable decreases the likelihood of the undervaluation of an asset it does not mean that such increases will have equally strong effects on making investors overvalue that asset. For variables where the proportional odds assumption is not violated, the estimation results of the OL and the GOL models coincide.

To test whether there are significant differences in the expected return–risk ratios of investors with different nonfinancial motives across assets, we extend the analysis by including an interaction term consisting of an indicator variable capturing strong nonfinancial motives and an indicator variable for equities and an indicator variable for bonds. In a similar vein, to test whether there are significant differences in the expected return–risk ratios of investors with different nonfinancial motives across investors with and without experience with losses, we

extend the analysis by including an interaction term consisting of an indicator variable capturing strong nonfinancial motives and an indicator variable for experience of losses with the corresponding asset. Since it is well known that the estimated coefficients of interaction terms in nonlinear models cannot be directly interpreted (Ai and Norton, 2003; Greene, 2010), we use the estimates and compute the marginal effects for the variables in the interaction terms and their correct standard errors.²

Missing values of the control variables are included as separate categories in all estimations.³ As part of our robustness checks, we repeat the analysis by omitting the missing values from all variables. This reduces the number of observations compared to the estimations in the main analysis, but the main effects remain statistically significant (see Table A3 and Column 3 and Column 4 of Table A5 in the online appendix).

Missing values in some questions used to assess the strength of financial and nonfinancial motives lead to missing values for the corresponding indices. To check whether these missing values drive our main results, we use the underlying variables for each index to construct averages of the variables with non-missing values for each index. As in the main analysis, we use the indices constructed as averages of the variables with non-missing values to distinguish between investors with strong and with weak financial, respectively nonfinancial, motives. Repeating the main analysis using these categories of investors reduces the number of missing observations compared to the main analysis, but the results do not change qualitatively (see Table A4 and Column 5 and Column 6 of Table A5 in the online appendix).

We perform additional robustness tests without reporting the results in separate tables.⁴ First, we repeat the estimations in the main analysis using fractional logit models with scaled return–risk ratio as a dependent variable. The scaled return–risk ratio is the return–risk ratio divided by the maximum value of the return variable. The scaled return–risk ratios take values between 0.04 and 1. All results remain qualitatively identical. Second, we repeat the main analysis by using the estimated indices of nonfinancial and of financial motives instead of the categories based on their medians. This analysis does not lead to qualitatively different results.

4. Results

We first report the results of our analysis evaluating whether differences in the strength of nonfinancial motives motivate investors to perceive the attractiveness of different asset classes differently from a financial point of view. Then we report the results of our analysis investigating whether investors with stronger nonfinancial motives have different performance expectations when they experience losses than investors with weaker nonfinancial motives.

4.1. Nonfinancial motives and performance expectations

We first explore descriptively how impact investors with different nonfinancial motives assess the performance potential of different asset classes. For this purpose, we use the proportion of investors with strong nonfinancial motives and evaluate how this proportion differs among investors with different assessments of the return–risk potential of different assets. Fig. 1 captures the results of this descriptive analysis.

As can be seen in Fig. 1, for equities, the proportion of investors with strong nonfinancial motives decreases with an increase in expected investment performance. Of those who expect that equities will

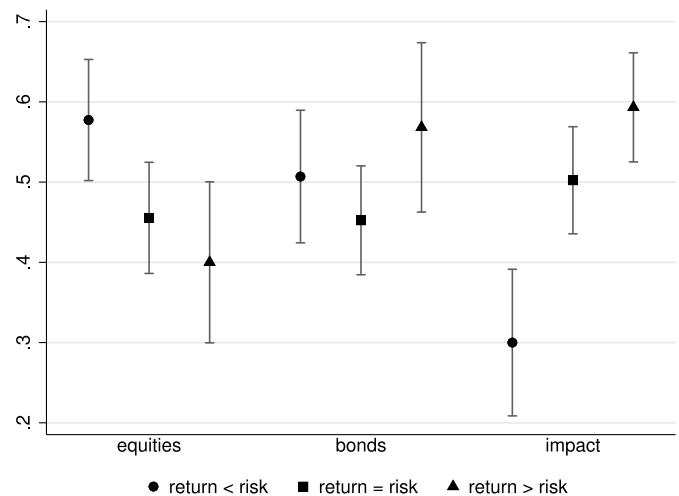


Fig. 1. Proportion of investors with strong nonfinancial motives among investors with different performance expectations.

The figure shows the proportion of investors with strong nonfinancial motives among investors with different performance expectations (return is smaller than, equal to, or larger than the risk of an asset) for different assets (equities, bonds, and the impact investment) together with 95% confidence intervals.

underperform (return < risk), about 58% have strong nonfinancial motives. The proportion of such investors decreases to 40% among investors who expect that equities will overperform (return > risk). These differences are statistically significant (Pearson χ^2 : 9.2; p -value: 0.01). In contrast, when evaluating the performance of the impact investment the proportion of investors with strong nonfinancial motives increases with the expected performance of the investment. Of those who undervalue the performance of the impact investment, 30% have strong nonfinancial motives, and the proportion of these investors increases to 59% among investors who overvalue the performance of the impact investment. These differences are statistically significant as well (Pearson χ^2 : 23.1; p -value: 0.000). For bonds, the corresponding differences cannot be considered statistically significant (Pearson χ^2 : 3.5, p -value: 0.175).

To take into account confounding effects emerging from experience with losses, financial motives, and the personal characteristics of the investors, we estimate the effects visualized in Fig. 1 using OL and GOL regressions as described in Section 3.3.

To facilitate a more meaningful interpretation of the estimation results, Table 1 includes the estimated average marginal effects for the likelihood that the observed return–risk ratios are smaller than, equal to, or greater than 1 for each asset type (equities, bonds, the impact investment). The estimated marginal effects are based on the GOL estimations whenever the proportional odds assumption is violated.

The estimated coefficients used to calculate the marginal effects are reported in Table A1 of the online appendix. The estimations for the GOL model are reported whenever the proportional odds assumption is violated. The rest of the coefficients in the GOL estimations are equivalent to coefficients estimated with the OL method. The estimation results without the control variables are reported in Table A2 of the online appendix.

As can be seen in the first three columns of Table 1, strong nonfinancial motives are associated with a higher probability of perceiving equities to be an unattractive investment. Having strong nonfinancial motives increases the probability of expecting equities to underperform by about 9 percentage points (see Column 1) and decreases the probability to expect overperformance by about 6 percentage points (see Column 3). For the impact investment, strong nonfinancial motives have the opposite effect on the expected performance. Having strong

² All estimations are done with Stata 17.

³ The index of financial motives is an exception. It is calculated in the same way as the index of nonfinancial motives, and the procedure does not allow the treatment of missing values as answers of a separate category. An alternative construction of both indices is applied as part of the robustness tests.

⁴ The estimation results are available upon request.

Table 1
Average marginal effects on the expected investment performance of different asset classes.

Return/risk Asset class	(1) <1 equities	(2) =1 equities	(3) > 1 equities	(4) <1 bonds	(5) =1 bonds	(6) > 1 bonds	(7) <1 impact	(8) =1 impact	(9) > 1 impact
Strong nonfinancial motives	0.085** (0.041)	-0.026* (0.014)	-0.059** (0.029)	-0.017 (0.040)	0.004 (0.010)	0.012 (0.030)	-0.093*** (0.026)	-0.050*** (0.015)	0.143*** (0.039)
Strong financial motives	0.049 (0.042)	-0.014 (0.012)	-0.035 (0.030)	0.018 (0.040)	-0.005 (0.010)	-0.013 (0.030)	-0.044* (0.026)	-0.022* (0.013)	0.065* (0.038)
Experience of loss	-0.016 (0.041)	0.005 (0.012)	0.011 (0.028)	0.120** (0.055)	-0.045* (0.027)	-0.076** (0.030)	0.110** (0.046)	0.030*** (0.009)	-0.140*** (0.049)
Impact experience, 5–10 years	0.101* (0.061)	-0.129** (0.051)	0.028 (0.051)	-0.121** (0.061)	0.036 (0.024)	0.085** (0.041)	-0.001 (0.037)	-0.000 (0.013)	0.001 (0.051)
Impact experience, 10–15 years	0.033 (0.057)	-0.010 (0.018)	-0.023 (0.040)	-0.058 (0.064)	0.023 (0.026)	0.035 (0.038)	-0.049 (0.037)	-0.027 (0.022)	0.076 (0.057)
Impact experience, more than 15 years	0.040 (0.063)	-0.013 (0.021)	-0.027 (0.043)	-0.073 (0.069)	0.027 (0.027)	0.046 (0.044)	-0.079** (0.035)	-0.054** (0.028)	0.133** (0.061)
Impact experience, missing	-0.059 (0.065)	0.009 (0.011)	0.050 (0.058)	-0.146* (0.076)	0.037 (0.024)	0.109* (0.066)	0.140 (0.091)	0.001 (0.024)	-0.141* (0.074)
Sex, male	-0.094** (0.042)	0.030* (0.015)	0.064** (0.028)	-0.012 (0.040)	0.003 (0.011)	0.008 (0.030)	0.032 (0.027)	0.016 (0.014)	-0.047 (0.040)
Sex, missing	0.008 (0.127)	-0.003 (0.056)	-0.004 (0.071)	0.020 (0.159)	-0.006 (0.054)	-0.014 (0.106)	-0.077 (0.048)	-0.080 (0.072)	0.157 (0.119)
Age, 50–69 years	0.151*** (0.045)	-0.022* (0.012)	-0.129*** (0.044)	0.006 (0.054)	-0.001 (0.012)	-0.004 (0.041)	0.053 (0.042)	-0.104** (0.046)	0.050 (0.058)
Age, 70 or older	0.140** (0.056)	-0.018 (0.015)	-0.122** (0.049)	0.037 (0.061)	-0.010 (0.017)	-0.027 (0.045)	-0.025 (0.036)	-0.017 (0.024)	0.043 (0.060)
Age, missing	0.151 (0.255)	0.155 (0.254)	-0.306*** (0.041)	-0.090 (0.168)	0.002 (0.035)	0.088 (0.198)	0.130 (0.242)	0.014 (0.055)	-0.144 (0.194)
Income, 30 K–80 K	-0.095 (0.137)	0.046 (0.075)	0.050 (0.063)	-0.093 (0.157)	0.035 (0.075)	0.058 (0.083)	0.000 (0.073)	0.000 (0.042)	-0.000 (0.115)
Income, 80 K–120 K	-0.172 (0.136)	0.069 (0.074)	0.103 (0.064)	-0.104 (0.156)	0.037 (0.075)	0.066 (0.082)	0.016 (0.073)	0.008 (0.041)	-0.024 (0.114)
Income, more than 120 K	-0.153 (0.142)	0.064 (0.075)	0.088 (0.070)	-0.098 (0.163)	0.036 (0.076)	0.062 (0.089)	0.005 (0.075)	0.003 (0.043)	-0.008 (0.118)
Income, missing	-0.118 (0.166)	0.054 (0.081)	0.064 (0.089)	0.171 (0.188)	-0.104 (0.107)	-0.067 (0.086)	0.056 (0.093)	0.021 (0.042)	-0.078 (0.132)
Observations	465	465	465	442	442	442	523	523	523

This table includes the average estimated marginal effects based on the estimated coefficients reported in Table A1 with the ordered categorical return–risk ratio as a dependent variable. For the categorical independent variables, the base categories are weak nonfinancial motives, weak financial motives, no experience of losses with the respective asset class, impact investing experience of less than 5 years, female, age under 49, and income under CHF 30,000. Income figures are in Swiss francs. Standard errors calculated using the Delta method are reported in parentheses. ***, **, and * indicate the significance of the estimated marginal effects at the 1%, 5%, and 10% level, respectively.

nonfinancial motives decreases the probability of expecting underperformance from the impact investment by about 9 percentage points (see Column 7) and increases the probability of expecting overperformance from the impact investment by about 14 percentage points (see Column 9). There are no significant differences in the assessment of the performance potential of bonds among investors with different nonfinancial motives (see Columns 4–6). Strong financial motives have no significant effect on performance expectations regarding the assets.

Regarding the relevance of experience of losses as a potential driver of performance expectations, we find that such experience with the corresponding asset is associated with lower expectations regarding the performance potential of the impact investment and bonds. In contrast, holding the impact investment for a longer time does not have an impact on performance expectations. Only holding the impact investment for at least 15 years as compared to being invested for less than 5 years decreases the estimated probability of expecting underperformance from the impact investment—by about 8 percentage points (see Column 7)—and it increases the probability of expecting overperformance from the impact investment by about 13 percentage points (see Column 9).

Regarding the importance of the other control variables, we find that sex and age matter only for performance expectations regarding equities. Males are more likely to expect overperformance and less likely to expect underperformance than are females, confirming previous evidence on stock market price expectations provided by Hurd et al. (2011). Older respondents in turn are more likely to expect underperformance and less likely to expect overperformance than are respondents under 49 years of age, and Hurd et al. (2011) report that age matters very little in explaining expected stock market prices.

To test for significant differences in performance expectations between investors with different nonfinancial preferences across asset classes, all performance estimates are pooled and an interaction term between nonfinancial motives and the asset type is included in the estimations as an additional independent variable, as described in Section 3.3. Table 2 includes the estimated marginal effects of this interaction term. The estimated coefficients of the term are included in Table A1 of the online appendix.

The results reported in Table 2 show a significant negative impact of stronger nonfinancial motives on the expected performance of equities as compared to the expected performance of the impact investment. Having strong nonfinancial motives increases the estimated probability of expecting the underperformance of equities as compared to the impact investment by about 23 percentage points, and increases the estimated probability of expecting overperformance of the impact investment as compared to equities by about 26 percentage points. Stronger nonfinancial motives also have a significant impact on performance expectations regarding bonds as compared to the performance of the impact investment, but the estimated effect is much smaller than the effect for equities. Having strong nonfinancial motives increases the estimated probability of expecting underperformance from bonds as compared to the impact investment by about 10 percentage points and increases the estimated probability of expecting overperformance from the impact investment as compared to bonds by about 16 percentage points.

These results reveal interesting patterns in performance expectations with regard to the different asset classes. Although from an investment point of view there should be no asymmetry in the assessments of the return and risk potentials of the different assets, a

Table 2
Marginal effects on expected performance across assets.

Return/Risk	smaller than 1	equal to 1	greater than 1
Strong nonfinancial motives x (equities vs impact)	0.233*** (0.048)	0.029 (0.02)	-0.263*** (0.048)
Strong nonfinancial motives x (bonds vs impact)	0.096** (0.047)	0.066*** (0.019)	-0.162*** (0.047)
Observations	1,430	1,430	1,430

This table includes the estimated marginal effects after GOL regressions with the ordered categorical return–risk ratio as a dependent variable, as described in Section 3.3. The base category is investors with weak nonfinancial motives. Standard errors calculated using the Delta method are reported in parentheses. *** and ** indicate the significance of the estimated marginal effects at the 1% and 5% level, respectively.

significant proportion of investors deviate from this rule. In particular, the results reported in Table 1 suggest that impact investors with stronger nonfinancial motives are significantly more optimistic regarding the performance potential of the impact investment and significantly less optimistic regarding the performance potential of equities than investors with weaker nonfinancial motives. A cross-asset evaluation of these differences as reported in Table 2 suggests that stronger nonfinancial motives are associated with significantly higher expected performance for the impact investment as compared to equities and to bonds. The effect on bonds is smaller than the effect on equities, probably because bonds and the impact investment have similar return–risk profiles.

Additionally, the observation that experience of losses corrects the expectations regarding the performance potential of the impact investment while more long-standing experience with the impact investment does not suggest that the kind of experience gained while being invested matters when it comes to forming performance expectations. While the feedback inherent in experience of losses supports the revision of beliefs regarding the performance of the impact investment, experience gained by holding the impact investment itself does not. Rather, experience gained by holding the impact investment can eventually support the development of overoptimistic expectations.

4.2. Performance expectations and experience of losses

As documented in the previous section, investors who have experienced losses with the impact investment are less optimistic regarding its performance potential, on average. The following analysis evaluates whether differences in nonfinancial motives matter for the performance expectations that investors who have experienced losses have. To evaluate these differences descriptively, Fig. 2 plots the proportion of investors who have experienced losses with the impact investment while distinguishing between investors with different nonfinancial motives and different performance expectations.

As can be seen in Fig. 2, investors with different nonfinancial motives appear to differ in the way they adjust their performance expectations to the experience of losses. While the relationship between performance expectations and the experience of losses appears to be negative among investors with weak nonfinancial motives, this relationship has no clear pattern among investors with strong nonfinancial motives. The proportion of investors with weak nonfinancial motives who have experienced losses decreases from about 29% among those expecting underperformance to about 10% among those expecting overperformance (Pearson χ^2 : 10.3; p -value: 0.006). Among investors with strong nonfinancial motives, the proportion of investors who have experienced losses remains between 15% and 17% (Pearson χ^2 : 0.062; p -value: 0.97).

To evaluate the statistical significance of the observed difference in the way investors with different nonfinancial motives adjust their performance expectations to the experience of losses, we extend the previous estimation model by adding an interaction term that captures differences in nonfinancial motives and experience of losses, as described in Section 3.3. The estimated coefficients are reported in Column 1 and Column 2 of Table A5 in the online appendix. To facilitate a better interpretation of these estimated coefficients, Table 3

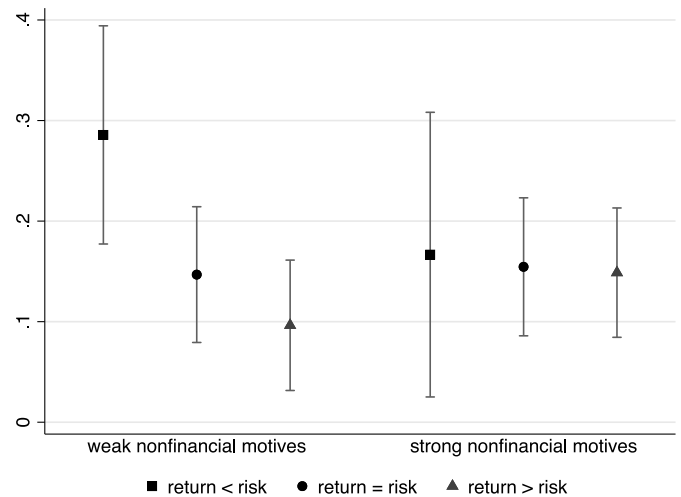


Fig. 2. Proportion of investors with experience of losses. The figure shows the proportion of investors who have experienced losses with the impact investment among investors with different nonfinancial motives (weak and strong) and investors with different performance expectations for the impact investment, together with 95 percent confidence intervals.

reports the marginal effects of the variables in the interaction term on the expected performance of the impact investment.

The estimation results show that having experienced losses, investors with strong nonfinancial motives become more optimistic regarding the performance potential of the impact investment as compared to investors with weaker nonfinancial motives. Experience of losses decreases the probability that investors with strong nonfinancial motives expect that the impact investment will underperform, by about 24 percentage points, and increases the probability that they expect overperformance, by about 19 percentage points as compared to investors with weak nonfinancial motives. These differences emerge because experience of losses does not significantly affect the performance expectations of investors with strong nonfinancial motives, while investors with weak nonfinancial motives revise their expectations regarding the performance potential of the impact investment after experiencing losses.

5. Discussion and conclusion

Investment decision-makers respond to the sustainability characteristics of available investment alternatives in different ways. Under the zero-sum heuristic, decision-makers may assume that other characteristics of sustainable products must be inferior to those of the alternatives (Chernev, 2007; Pancer et al., 2017; Newman et al., 2014), which makes sustainability characteristics a liability. On the other hand, sustainability characteristics can cause a halo effect (Chernev and Blair, 2015; Lee et al., 2013; Hong and Liskovich, 2015; Walker et al., 2016) that makes other characteristics of the same investment appear more attractive to decision-makers.

Table 3
Marginal effects on the expected performance of the impact investment.

Return/Risk	smaller than 1	equal to 1	greater than 1
Strong nonfinancial motives x loss experience	-0.236*** (0.089)	0.050 (0.055)	0.186** (0.094)
Observations	523	523	523

This table includes the estimated marginal effects after GOL regressions with the ordered categorical return–risk ratio as a dependent variable, as described in Section 3.3. The base categories are investors with weak financial motives, without experience of losses. Standard errors calculated using the Delta method are reported in parentheses. *** and ** indicate the significance of the estimated marginal effects at the 1% and 5% levels, respectively.

In this study, we find evidence that the halo effect dominates the liability characteristic of the impact investment. In particular, we find that impact investors with stronger nonfinancial motives are more likely to perceive the impact investment as an attractive investment opportunity.

We also observe that investors with stronger nonfinancial motives view investments that they are less likely to make, such as investments in traditional equities, as less attractive from a financial point of view. These observations are in line with research in other domains that shows a positive link between the strength of a halo effect and the “green” values (Haws et al., 2014) or the moral concerns of decision-makers (Chernev and Blair, 2021).

Additionally, we argue that the positive preference–expectations link that we find is sustained by feedback, which is in line with the experimental findings of Zimmermann (2020), who observes that motivated beliefs survive even when they are challenged. Although the performance perception of the impact investment decreases with broader investment experience and increases with experience with the impact investment, the relationship between nonfinancial preferences and performance expectations remains statistically significant in our sample. More importantly, we find that investors with different nonfinancial preferences differ in the way they meet the challenges to their performance expectations imposed by the experience of losses. After losses, investors with stronger nonfinancial motives are significantly less likely to temper their expectations that the impact investment will underperform than are other investors.

These findings have to be seen in the context of some limitations. Although the participants in our survey can be considered as well informed with respect to the impact investment, the sample is not random, and it does not represent the general population in terms of age and income characteristics. Hence, the findings may not hold with a different sample of participants. Additionally, as the survey was sent on paper, together with other materials that investors received, it was not possible to manage nonresponse to questions. By treating nonresponse as a separate category in some questions, we tried to take into account that there might be systematic differences between respondents and non-respondents, but the nonresponse to some questions significantly reduced the number of observations that we were able to use in the estimations. Finally, we were limited in the number of questions that we could ask, since our survey questions were included in a broader survey serving the information needs of Oikocredit. This did not allow us to evaluate other characteristics of the investors that could have been of potential interest, including the matter of financial literacy. However, the exclusion of a financial literacy assessment is unlikely to bias our main results. This assertion is based on the observation that two different proxies of financial literacy are unrelated to the nonfinancial motives of the participants, which is our main independent variable. The first proxy of financial literacy refers to the notion that individuals with a stronger financial literacy are probably more likely to be able to assess the performance potential of different asset classes.⁵ Hence, we use a dichotomous variable for the cases that participants provide performance estimates for each asset class and find that this proxy of financial literacy is not significantly related to the

level of nonfinancial motives for any of the asset classes, according to Pearson Chi-squared tests. The second proxy of financial literacy is the experience with losses, which reflects the idea that knowledge can be gained through experience. This proxy of financial literacy is also not significantly related to the level of nonfinancial motives for any of the asset classes, according to Pearson Chi-squared tests. On a more general level, our study entails all other limitations that cross-sectional studies have, including the possibility that our results are biased by some unobservable variables that affect both the nonfinancial motives and the performance expectations.

Future research should test the robustness of our findings. Investors’ financial and non-financial objectives may change over time as more information about various sustainable investment opportunities becomes available, as recently observed. Our results could also be contingent on the macroeconomic environment in which investors form their preferences and performance expectations. This includes periods of exceptionally high or low market returns, or during times of heightened economic uncertainty. Future research should also more directly test motivated beliefs. For example, does the favorable evaluation of an impact investment hold when the nonfinancial values associated with it are challenged – or reinforced – directly? Additionally, future research could examine potential moderators for motivated reasoning. For example, is there a certain price for impact at which investors may no longer be able to justify their investments through motivated reasoning processes? Finally, future research should take into account that investments containing both positive and negative characteristics in terms of impact or sustainability in general might be interpreted differently based on underlying nonfinancial motives.

In terms of practical implications, our findings suggest that both investment motives and investment experience are important determinants of investors’ ability to assess (impact) investment opportunities. Furthermore, our results indicate that the willingness to pay for impact is not only likely to be linked to preferences for sustainable products but is also driven by financial expectations. These expectations are in turn affected by experience of losses. This may be important for policymakers who aim to support investors’ efforts to find investments that match their preferences. So far, the main policy approach has been based on providing investors with accurate information. Such information is indisputably important. But its provision does not guarantee that it will be utilized optimally. In fact, if beliefs are motivated by preferences, and preferences can hinder learning from the experience of losses as we show, investors might use only information that is in line with their preferences, as demonstrated by various other studies (Charness and Dave, 2017; Nickerson, 1998; Edwards and Smith, 1996). This limits the efficacy of policies aiming to improve the accuracy of information and calls for additional measures that can help sustainable investors to form better performance expectations and ultimately reach better investment outcomes.

CRediT authorship contribution statement

Kremina Bachmann: Conceptualization, Formal analysis, Methodology, Software, Supervision, Writing – original draft, Writing – review & editing. **Julia Meyer:** Data curation, Writing – review & editing. **Annette Krauss:** Resources, Writing – review & editing.

⁵ We thank an anonymous referee for this hint.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.jbef.2024.100911>.

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