African Journal of Business and Economic Research (AJBER)
(Online) ISSN 1750-4562 (Print) ISSN 1750-4554

Indexed by SCOPUS, UGC CARE List, IBSS, EBSCO, ProQuest, ABDC, SAJE, COPERNICUS, CABELL, Sabinet and J-Gate

Vol. 17, (Issue 2), June 2022
pp 7- 33

The Impact of Framing on Impact Investing

DOI: https://doi.org/10.31920/1750-4562/2022/v17n2a1

Fatima Harvey
Gordon Institute of Business Science,
University of Pretoria
26 Melville Rd, Illovo, Johannesburg, 2196, South Africa
19388226@mygibs.co.za

Kerrin Myres
Gordon Institute of Business Science,
University of Pretoria
26 Melville Rd, Illovo, Johannesburg, 2196, South Africa
myresk@gibs.co.za

&

Gavin Price
Gordon Institute of Business Science,
University of Pretoria
26 Melville Rd, Illovo, Johannesburg, 2196, South Africa
priceg@gibs.co.za

Abstract

Impact investors are faced with the issue of risk and return evaluation on both the scale of financial performance and social performance. The study extends the understanding of the relationships between investor perception of risk, sense of understanding, and financial decision-making into the inherently dichotomous context of impact investment. Through the lens of prospect

theory, an instrument for data collection was designed to evaluate the effects of finance outcome dominant, social outcome dominant, and hybrid outcome framing on an investor's perception of risk, sense of understanding, and capital allocation decisions. This research found that variability in outcome framing influences an investor's capital allocation decision but does not affect the perception of risk or sense of understanding. These findings contribute to the understanding of how the framing of compound outcomes with both financial and moral implications affects the decision-making choice process of individuals.

Keywords: *Impact investment, Framing, Sense of understanding, Perceived risk, Prospect theory*

1. Introduction

The practise of impact investing is distinguished from other forms of investment by its explicit intention to optimise financial and non-financial goals, with the latter impact evaluated in the form of social and environmental impact (Höchstädter and Scheck 2015; Lee et al. 2020). Consequently, the disclosure of outcome information is critical for establishing investor expectations of financial and non-financial performance (Brandstetter and Lehner 2015). The dichotomy presented by this blended value return increases investors' sensitivity to variability in how outcome information is framed (Lehner et al. 2019; Nicholls 2010). The ideas of reference point and framing in prospect theory provide a framework for understanding how individuals make investment decisions in uncertain situations (Kahneman and Tversky 1979).

Recent research on impact investing has examined a broad range of interests, including the behavioural limitations of investors in capital allocation decisions (Døskeland and Pedersen 2016; Lee et al. 2020); structural and operational barriers to securing impact investment (Phillips and Johnson 2019); practices of evaluation and measurement (Mogapi et al. 2019; Vo et al. 2016); and explorations of the cognitive evolution of the field and its legitimisation strategies (Lehner et al. 2019). This work reveals that outcome information is critical to an investor's decision-making process and is susceptible to bias and variation. Three primary sources of outcome information variance have been identified: hybrid business model variability, institutional inconsistency in impact management and metrics, and impact reporting ownership (Brandstetter and Lehner 2015; Mogapi et al. 2019; Nicholls 2009; Santos et al. 2015; Vo et al. 2016). An area yet to be addressed fully within existing literature

is the extent to which this variance in outcome information influences an investor's perception of impact risk and understanding of the investment opportunity, and the effect of said influence on capital allocation decisions in the context of impact investments.

The heuristic nature of financial decision-making together with the inherent dissonance that exists between the practices and tools of traditional investment and those of impact investment create a unique environment within which to study the effects of information framing (Brandstetter and Lehner 2015; Forbes et al. 2015; Lee et al. 2020). Therefore, this study aims to demonstrate the influence of the variability in outcome framing on an individual investor's risk perception and capital allocation decisions.

2. Literature Review and Hypotheses Development

When individuals face choices in the context of uncertainty, "psychological tendencies" influence decision-making (Heutel 2019; Tversky and Kahneman 1986, p. S261). According to prospect theory, individuals tend to evaluate choices based on a reference point rather than objective evidence. and prefer outcomes with higher certainty and lower risk (Heutel 2019; Kahneman and Tversky 1979). Individuals display these behaviours even when choices yield identical outcomes (Tversky and Kahneman 1986). This reference point represents a neutral outcome from which decisions yield a positive or negative deviation (Tversky and Kahneman 1986). In practice, the reference point can shiftby framing tactics, such as risk classification and positive and negative labelling (Tversky and Kahneman 1986). The dynamic nature of the reference point makes decision-makers susceptible to variations in the outcome framing of choice options (Tombu and Mandel 2015; Tversky and Kahneman 1986). The nature of impact investment requires decision-makers to consider two reference points – financial and social – when evaluating risk and return. Thus, impact investing presents an interesting context to examine framing effects related to compound outcomes.

2.1. *Impact Investing*

Impact investment is conceptualised in literature as a spectrum of investment activity, with the extremes being finance-first investors and philanthropists (Brandstetter and Lehner 2015; Nicholls 2010). Impact investors are distinguished by their direct investment practice in an

enterprise, organisation, or fund to contribute to achieving their stated outcomes (Hornsby and Blumberg 2013). The beneficiaries of impact investments are hybrid organisations that pursue financial and social goals simultaneously (Brandstetter and Lehner 2015; Lee et al. 2020). Outcome reporting for hybrid enterprises has been pioneered and advanced predominantly by hybrid enterprises (Nicholls 2009). While there is increasing adoption of global standards of measurement and reporting tools, such as IRIS+, much variability in impact measurement and management systems still exists (Lehner et al. 2019). Calls for transparency in outcome reporting have become increasingly important for attracting additional capital into the impact investing market (Brandstetter and Lehner 2015; Hand et al. 2020).

The field presents a unique challenge in risk measurement and return. which is insufficiently addressed by traditional investment practices and tools (Brandstetter and Lehner 2015; Vo et al. 2019). The non-financial measurement (i.e., social) risk and return is an emerging practice characterised by variability and inconsistency (Brandstetter and Lehner 2015). Portfolio efficiency for impact investments is assessed based on impact generation, defined as "the potential for real change that an investment opportunity offers" (Hornsby and Blumberg 2013, p. 88). The impact can materialise directly for the beneficiaries, the community, and the hybrid enterprise (Hornsby and Blumberg 2013). Risk in impact investment considers *impact risk*, defined as the "measure of uncertainty that an organisation will deliver on its proposed impact" (Brandstetter and Lehner 2015, p. 94). The complexity of quantifying social risk makes it difficult to aggregate both financial and non-financial risk to develop an overall evaluation of risk for hybrid investments. Literature suggests that when relevant non-financial risk is identified, it should be considered "meaningfully higher than financial risk measure" (Brandstetter and Lehner 2015, p. 98; Døskeland and Pedersen 2016;). From this, it can be inferred that investors may raise their risk aversion and decrease the attractiveness of an investment when presented with dominant social outcome information because of increased uncertainty.

2.2. Framing and Heuristics

The consequence of variances in framing of choice options is referred to as the *framing effect* (Tversky and Kahneman 1981, 1986). When the outcome of simultaneous choices is presented differently, despite the choices having equivalent outcomes, individuals exhibit choice preferences, thereby, indicating that the presentation of outcome

information influences their choice (Tversky and Kahneman, 1986). Impact investors have a greater inclination to utilise heuristic decision-making than other financial decision-makers (Lee et al. 2020) because they are exposed to a large volume of information, which may be cognitively overwhelming (Pilak, 2017). Following the emergence of the socially responsible asset classes, framing strategies have been used by entrepreneurs to differentiate and legitimise their products (Markowitz et al. 2012).

2.3. *Information Variance and Financial Decision-making*

Consistency in the presentation and content of outcome reporting enables an investor's sense of understanding and risk assessment in the portfolio management process (Long et al. 2018). While information variance can occur in presenting all types of information (Tversky and Kahneman 1986), the current challenges in non-financial measurement create distinct opportunity to observe the effects of information variance in the impact investment field. Fatemi et al. (2018) found that the intensity and variance in reporting tend to be primarily a result of investor perception and less about true performance. Moreover, the investor mindset may influence the decision frame applied to outcome information (Lehner et al. 2019).Furthermore, social investors display a strong preference for communicating non-financial impact in contrast to traditional investors who commonly defer in communicating financial impact (Lehner et al. 2019). In a complementary insight, Azmi et al. (2018) contended that when investors feel ethically obligated to the outcome of the investment, variance in the information related to the outcome of such socially oriented investments is likely to have a disproportionate impact on investor decision-making.

Several experimental studies have explored the relationship between presentation and disclosure of information and investment decisions (Døskeland and Pedersen 2016; Lee et al. 2020; Linciano et al. 2018; Woike et al. 2015). One study concluded that investors who built their future strategies on a narrow base of feedback about prior business plan outcome information performed worse than those exposed to a broader feedback base (Woike et al. 2015). While investors seek reliable information to evaluate the financial viability of investments, the literature reveals that hybrid enterprises may be motivated to present information aimed at influencing decision-makers in their favour (Vo et al. 2016). Manipulating how information is framed has been shown to influence decision-makers' attitudes and actions, specifically in financial

decision-making (Døskeland and Pedersen 2016; Linciano et al. 2018). While financial costs and benefits and moral costs and benefits are considered in socially responsible investments, financially relevant information may be more effective at reducing perceived uncertainty for investors (Døskeland and Pedersen 2016). In their study on the outcome efficiency of impact investment decisions, Lee et al. (2020) reported that a more structured presentation of outcome information was ineffective in improving the efficiency of an investor's capital allocation decisions. However, by disclosing or suppressing the labels on a set of investment options, the authors demonstrated that investment decisions were influenced by the perceived value of that investment as determined by an investor's categorical cognition rather than objective outcomes (Lee et al. 2020). This categorical labelling could be considered outcome framing (Tombu and Mandel 2015). Therefore, it is hypothesised that:

Hypothesis 1: Finance-dominant framing affects the capital allocation decisions of impact investors.
Hypothesis 2: Hybrid framing affects the capital allocation decisions of impact investors.
Hypothesis 3: Social-dominant framing affects the capital allocation decisions of impact investors.

2.4. Risk Perception

According to decision theory, the risk is perceived based on the given choice measured compared to all possible outcomes, often referred to as outcome variance (Kahneman and Tversky 1979; Long et al. 2018; Tombu and Mandel 2015). Outcome variance has been established as a significant contributing factor in assessing risk in decision-making, and variations in the framing of outcome variances strongly influence individuals' risk perceptions (Tombu and Mandel 2015; Tversky and Kahneman 1986). While perceived complexity is the primary driver of perceived risk, individual characteristics like gender, financial literacy, and age can magnify the framing effects of information disclosure (Linciano et al. 2018). Overall, social outcomes are viewed as incremental benefits and may not be sufficient to stand on their own against financial outcomes (Døskeland and Pedersen 2016). When grouped with financial outcomes, social outcomes may be viewed as more advantageous if the reference point is social outcome information only: whereas when financial information is presented, the sensitivity to additional social

outcomes information is minimal (Brandstetter and Lehner 2015). Therefore, it is hypothesised that:

> **Hypothesis 4:** Finance-dominant framing positively affects the perceived risk of an impact investment decision.
> **Hypothesis 5:** Hybrid framing positively affects the perceived risk of an impact investment decision.
> **Hypothesis 6:** Social-dominant framing negatively affects the perceived risk of an impact investment decision.

2.5. Sense of Understanding

An individual's sense of understanding guides individual decision-making (Long et al., 2018). The sense of understanding construct differs from familiarity in that the latter relates only to exposure to an entity or object and does not consider knowledge thereof (Long et al., 2018). Through data gathering and information about a problem, individuals develop a subjective knowledge base that enables them navigate uncertainty and act in unfamiliar situations (Long et al., 2018). However, this heuristic judgement emphasises subjective risk and is a poor indicator of the objective risk of an investment (Long et al., 2018; Wang et al., 2011). Research has demonstrated that this sense of understanding influences investor interest, confidence, and risk appetite, particularly in expert investors (Linciano et al., 2018; Long et al., 2018). When a sense of understanding is diminished, an investor's risk perception is negatively affected (Linciano et al., 2018; Long et al., 2018). Literature also suggests that risk tolerance moderates the effects of a diminished sense of understanding (Long et al., 2018). Consequently, it is hypothesised that:

> **Hypothesis 7:** Finance-dominant framing positively affects an investor's sense of understanding of a hybrid enterprise.
> **Hypothesis 8:** Hybrid framing positively affect an investor's sense of understanding of a hybrid enterprise.
> **Hypothesis 9:** Social-dominant framing negatively affects an investor's sense of understanding of a hybrid enterprise.

3. Methods

3.1. *Experimental Procedure*

An experimental design was used to establish a causal relationship between the variables identified in this research (Kirk 2012). A single-

factor post-test-only experiment was considered acceptable to answer the proposed research questions because the researchers could establish the expected value of the mean that would be observed in the absence of the dominant disclosure scenarios (Kirk 2012). The experiment followed a between-subjects design where participants were exposed to multiple counterbalanced treatments using a completely randomised design. Participants were randomly assigned an outcome disclosure scenario for each of the three companies independently (Brown and Melamed 1990) and responded to only one scenario for each company.

The research instrument was self-administered using a web-based questionnaire in line with established academic conventions (Lee et al. 2020; Long et al. 2018). Acknowledging their informed consent, participants were provided with a task briefing and instructions (see Exhibit A in Supplemental Materials), which gave an overview of the context of the sector and guidance on what would be required. The experiment's self-administered questionnaire was divided into three sections. First, participants indicated education and business and investment interest and experience for sample qualification (Lee et al. 2020; Lipe 2018). Next were questions related to their industry knowledge and risk tolerance. Four risk profiles, adapted from Long et al. (2018)'s research, were provided: (1) a short-term low-risk tolerance, (2) a long-term low-risk tolerance, (3) a short-term high-risk tolerance, and (4) a long-term high-risk tolerance. Secondly, participants were provided with company briefing information and asked questions related to their risk perception and sense of understanding, adapted from the research of Long et al. (2018). In the third section, participants were given a hypothetical financial endowment of USD$2 000 to fully allocate across three companies (Lee et al. 2020; Long et al. 2018).

3.1.1. Outcome Treatments

Three fictitious companies were profiled for this experiment to allow for sufficient variation in the description of financial and non-financial impact (Tombu and Mandel 2015). Company profiles were adapted from publicly available information on the company websites of three actual solar energy social enterprises. The profiles had differently worded company overview information but essentially the same mandate and objectives, with nearly equivalent financial and social outcomes. Any differences in profiles were negligible. Information about the companies were presented to participants based on established categories of

informational cues that investors use to evaluate potential investment opportunities (Woike et al. 2015):

> (a) product characteristics, (b) market characteristics, (c) the company's financial position and outlook, (d) the traits of the entrepreneur or management team, and (e) other cues such as the interest of another [investor] in a business plan under consideration or the ability of [an investor] to add value to a deal (p. 1706).

Variance in the company profiles was established through the framing of the metrics populated in the outcome tables. For each company, three outcome framing scenarios were developed: (1) dominant financial (DF) outcome disclosure, (2) dominant social (DS) outcome disclosure, and (3) hybrid financial and social (HFS) outcome disclosure. Thus the independent variable for the framing scenario was a three-category nonmetric variable. There were nine possible treatments (see Exhibit B in Supplemental Materials). Outcome treatments were randomly assigned to participants based on equal weighting for each of the three outcome scenarios, which meant that for each company, participants had a 33.3% probability of being assigned to each scenario. However, as a result of data cleaning, the actual frequency of outcome treatments in the study sample was unequally weighted (DF = 32%; DS = 31%; HFS = 37%). The intervention was timed and the median completion time for this study's questionnaire was five minutes, which was less than comparative studies (Lee et al. 2020) that reported eight minutes and 11 minutes.

3.2.*Sample*

This study gathered data via an online questionnaire from a broad heterogeneous population of individuals capable of making investment decisions (Höchstädter and Scheck 2015). Purposive sampling and self-selection sampling were applied to recruit participants from three groups: (1) individuals participating in SurveyMonkey Audience, (2) members of the Southern African Venture Capital and Private Equity Association (SAVCA), and (3) current Master of Business Administration (MBA) students at the University of Pretoria, who are considered "reasonable proxies for nonprofessional investors" (Lipe 2018, p. 18).

In total, 198 consented responses were collected from the SurveyMonkey tool. Consented responses were first screened for their suitability based on the investor qualification criteria put forth by Lipe (2018). A missing values analysis (MVA) was conducted to identify

missing data. 18 partial responses, in which all scenarios and their corresponding questions were completed, but the item-level data for the capital allocation task was incomplete, were retained in the sample. This missing data represented 14% of the final sample population. As literature suggested a strong relationship between the variables and results of the *t*-tests of the missingness confirmed that the data were missing completely at random (MCAR) and represented less than 20% of the final sample population, the missing values were replaced using the mean substitution imputation method (Hair et al. 2019). Based on these screening procedures, the final sample for this study was 133 participants, which was deemed sufficient based on suggested sample size guidance for the multivariate techniques used to test the hypotheses (Hair et al. 2019; Lee et al. 2020).

Approximately 50% of the respondents had less than two years of energy sector investment experience. However, nearly all respondents had at least a moderate amount of knowledge of business and investing, with just over one-third of participants responding that they had a great deal of knowledge, and the majority reporting that they had frequently made investments in the prior year. Risk tolerance within the sample was nearly even, with 47% of participants reporting a high-risk tolerance and 52% reporting low-risk tolerance. The sample demographics are reported in Table 1.

Table 1 Data demographics

Variable	Frequency	Percentage
Educational qualification^	133	
MBA (Y/N)	71/36	
Gender (M/F)	84/49	
Age^^	133	
Energy sector investment experience		
None	43	32%
Less than 1 year	9	7%
1–2 years	23	17%
3–5 years	25	19%
6–10 years	22	17%
More than 10 years	11	8%
Knowledge of business and investing		
None at all	2	2%
A moderate amount	80	60%
A great deal	51	38%
Frequency of financial investments		
Never	7	5%
Infrequently	59	44%
Frequently	67	50%
Risk tolerance (high/low)	63/70	

^107 responses for "master's degree and above"
^^Mean age = 42.58; median age = 41.00; 25th percentile = 34.00; 50th percentile = 41.00; 75th percentile = 50.00

3.3.*Measures*

3.3.1.Sense of Understanding

Sense of understanding was measured using a four-item scale adapted from the work of Long et al. (2018). Items were scored on a five-point rating scale, where 1 was "strongly disagree" and 5 was "strongly agree". The scale based on these four items had excellent construct reliability (Cronbach's alpha = 0.805) (Hair et al. 2019). Construct validity was established through the confirmation of both convergent and discriminant validity (Hair et al. 2019). Correlation matrixes for the three

companies confirmed that all four items within the sense of understanding construct displayed correlations significant at the $p = 0.01$ level. A confirmatory factor analysis (CFA) performed for all three companies confirmed discriminate validity and validated that all four items loaded to one factor. Based on the correlation analysis and the CFA, the four items were combined and averaged into an aggregate sense of understanding variable (Hair et al. 2019).

3.3.2. Perceived Risk

Perceived risk was assessed using a one-item scale adapted from the work of Long et al. (2018) (e.g., "How risky would you rate an investment in Company X?"). Items were scored on a five-point scale ranging from 1 ("Very low/negligible risk") to 5 ("Very/extremely risky"). Risk perception is a well-established construct in literature and the reliability of a unidimensional scale for perceived risk is in line with existing research (Holzmeister et al. 2020).

3.3.3. Capital Allocation

The financial decision was measured using a single-item capital allocation task. The measurement instrument was adapted from the work of Lee et al. (2020) and Long et al. (2018), which used probability distribution tasks and capital allocation tasks. The reliability of this unidimensional scale was assured using measurement items from high-quality academic literature

4. Results

The data for this study were examined using statistical analysis using the IBM SPSS analytics platform. To evaluate the distribution of the sample, skewness and kurtosis values were examined. All variables fell within the acceptable boundaries, except for the capital allocation variable for Company A (Hair et al. 2019). The data for the capital allocation variable for Company A was transformed to group the values into three equal groups, after which skewness and kurtosis fell within the acceptable boundaries. Linearity and normality were confirmed using a visual inspection of the normal Q-Q plots for each variable (Hair et al. 2019). Indicator coding was used to construct dummy variables to satisfy the assumptions of linear regression and transform the treatment variable into three variables representing the three types of framing scenarios for

each company (Hair et al. 2019). Collinearity statistics were performed on independent variables and fell within the recommended tolerance (> 0.1) and variance inflation factor (VIF) values (< 10) (Hair et al. 2019). The results of the data analysis are reported in Table 2.

4.1. *Descriptive Statistics*

Table 2 presents the descriptive statistics for the study variables. The results indicate that perceived risk was not correlated with a sense of understanding. The DS scenario was positively correlated with capital allocation value for Company A ($r = 0.223$, $p < 0.01$). Perceived risk was negatively correlated with capital allocation value for Company C ($r = -0.184$, $p < 0.05$). No meaningful differences were observed in the mean values for perceived risk and sense of understanding across the three companies, but the capital allocation values were highest for Company A, followed by Company B and Company C. No significant differences in the mean were reported between individuals who reported high- versus low-risk tolerances and perceived risk.

Table 2 Descriptive statistics and correlations

Variable	Mean	Median	Std. dev.	Skew.	Kurt.	Correlations 1	2	3	4	5
Company A										
1. Capital allocation (n = 133)	784.41	784.41	382.71	0.00	1.50	–				
2. Perceived risk (n = 133)	2.62	3.00	1.17	0.40	0.59	0.163	–			
3. Sense of understanding (n = 133)	3.79	4.00	0.81	-0.95	.36	0.167	-0.036	(0.805)		
4. DF scenario (n = 40)						-0.161	-0.126	0.095	–	
5. DS scenario (n = 39)						0.223**	-0.047	0.015	-0.422**	–
6. HFS scenario (n = 54)						0.003	0.161	-0.102	-0.542**	-0.533**
Company B										
1. Capital allocation (n = 133)	639.45	639.45	278.95	-0.28	.72	–				
2. Perceived risk (n = 133)	2.68	2.00	1.22	0.40	0.82	-0.115	–			
3. Sense of understanding (n = 133)	3.77	4.00	-0.89	-0.77	.47	-0.005	-0.056	(0.855)		
4. DF scenario (n = 38)						0.018	0.000	0.034	–	
5. DS scenario (n = 48)						0.051	0.015	0.019	-0.475**	–
6. HFS scenario (n = 47)						-0.068	-0.015	-0.051	-0.468**	-0.556**
Company C										
1. Capital allocation (n = 130)	576.14	500.00	289.78	0.26	.60	–				
2. Perceived risk (n = 130)	2.6	2.00	1.13	0.42	0.62	-0.184*	-			
3. Sense of understanding (n = 130)	3.77	4.00	0.91	-1.03	.03	0.161	0.046	(0.894)		
4. DF scenario (n = 51)						-0.026	-0.048	-0.041	–	
5. DS scenario (n = 36)						0.042	-0.024	-0.021	-0.480**	–
6. HFS scenario (n = 45)						-0.013	-0.062	0.072	-0.564**	-0.436**

Note: Cronbach's alpha reliabilities for variables are in parenthesis.
*Significant at the 0.05 level, **Significant at the 0.01 level

4.2. *Hypotheses Testing*

Having confirmed that the measurement items had adequate reliability and validity, regression analysis was performed to quantify the relationship between constructs. This method is in line with the approach used by Long et al. (2018). A regression analysis was performed independently for each company to allow for a comparison of the results. The regression model considered only two of the three framing treatments, as it was necessary to establish a reference category for each regression due to the creation of dummy variables for the framing scenarios (Hair et al. 2019).

Hypotheses 1, 2, and 3 were concerned with examining the effect of outcome framing on capital allocation value. To test these three hypotheses, the dependent variable (capital allocation) and independent variables (DF and HFS scenarios) were entered into the regression model. The DS scenario was established as the reference category. The results of the regression, shown in Table 3, indicate a significant relationship between capital allocation and the DS framing scenario, relative to the DF and HFS scenarios for Company A ($F(2, 130) = 3.18$; $p = 0.025$) with an R^2 of 0.055. The unstandardised beta values revealed a significant negative (-0.482) unit difference between DS framing and DF framing ($p = 0.008$) and a significant negative (-0.338) unit difference between DS framing and HFS framing ($p = 0.047$), indicating DS framing and HFS framing were significant indicators of capital allocation value for Company A.

However, the adjusted R^2 value suggests that only 4.1% of the variance in capital allocation value is explained by the outcome frame. These results were not replicated in the outcome of the regression models for Company B ($F(2, 130) = 0.315$; $p = 0.730$) with an R^2 of 0.005, or Company C ($F(2, 130) = 0.114$; $p = 0.892$) with an R^2 of 0.002, which both indicated no significant relationship between capital allocation and the framing scenario.

Table 3 Multiple regression analysis for capital allocation

Variable	R	R-squared	Adj R-squared	Model sig.	Unstdbeta	t	Sig
Company A	0.235	0.055	0.041	0.025			
DF scenario (n = 40)					-0.482	-2.679	0.008*
DS scenario^ (n = 39)							
HFS scenario (n = 54)					-0.338	-2.009	0.047*
Company B	0.069	0.005	-0.010	0.730	-11.014	-0.181	0.857
DF scenario (n = 38)							
DS scenario^ (n = 48)					-44.202	-0.768	0.444
HFS scenario (n = 47)							
Company C	0.042	0.002	-0.014	0.892			
DF scenario (n = 51)					-28.621	-0.454	0.650
DS scenario^ (n = 36)							
HFS scenario (n = 45)					24.561	-0.379	0.705

^Reference case
*Significant at the 0.05 level

A confirmatory independent t-test was performed for Company A to assess the difference in the means between the DF, DS, and HFS scenarios for capital allocation value. The results reported in Table 4 indicate that there was a significant difference in the mean for both the DF scenario ($p = 0.049$, $d = 0.365$) and DS scenario ($p = 0.043$, $d = 0.384$). Thus, hypotheses 1 and 2 were supported, but hypothesis 3 was not supported.

	DF scenario				DS scenario				HFS scenario		
		Mean	Std. dev.	Sig.		Mean	Std. dev.	Sig.		Mean	Std. dev.	Sig.
Scenario present	0	684.765	360.638	0.049*	9	888.580	396.204	0.043*	4			0.972
Scenario not present	3	827.265	417.559		4	741.188	370.547		9			

*Significant at the 0.05 level

Hypotheses 4, 5, and 6 were concerned with examining the effect of outcome framing on perceived risk. The dependent variable (perceived risk) and independent variables (DF and HFS scenarios) were entered

into the regression model to test the three hypotheses. Once again, the DS scenario was established as the reference category. As shown in Table 5, the regression results indicated that the framing scenario did not significantly affect risk perception for any of the three companies: Company A ($F(2, 130) = 1.88$; $p = 0.157$) with an R^2 of 0.028, Company B ($F(2, 130) = 0.019$; $p = 0.982$) with an R^2 of 0.000, and Company C ($F(2, 130) = 0.322$; $p = 0.717$) with an R^2 of 0.005. As such, hypotheses 4, 5, and 6 were not supported.

Hypotheses 7, 8, and 9 were concerned with examining the effect of outcome framing on a sense of understanding. Similarly, to test these three hypotheses, the dependent variable (sense of understanding) and independent variables (DF and HFS scenarios) were entered into the regression model. As with the other hypotheses, the DS scenario was established as the reference category. The results shown in Table 6 indicate that the framing scenario did not significantly affect sense of understanding for any of the three companies: Company A ($F(2, 130) = 0.827$; $p = 0.440$) with an R^2 of 0.013, Company B ($F(2, 130) = 0.179$; $p = 0.836$) with an R^2 of 0.003, and Company C ($F(2, 130) = 0.278$; $p = 0.781$) with an R^2 of 0.004. As such, hypotheses 7, 8, and 9 were not supported.

Table 4 Multiple regression analysis for risk perception

Variable	R	R-squared	Adj R-squared	Model sig.	Unstd beta	t	Sig
Company A	0.168	0.028	0.013	0.157			
DF scenario (n = 40)							
DS scenario^ (n = 39)					-0.138	-0.529	0.598
HFS scenario (n = 54)					0.313	1.281	0.202
Company B	0.017	0	-0.015	0.982			
DF scenario (n = 38)					-0.024	-0.090	0.928
DS scenario^ (n = 48)							
HFS scenario (n = 47)					-0.049	-0.193	0.847
Company C							
DF scenario (n = 51)	0.072	0.005	-0.010	0.717			
DS scenario^ (n = 36)					-0.250	-0.100	0.921
HFS scenario (n = 45)					0.156	0.612	0.542

^Reference case
*Significant at the 0.05 level

Table 5 Multiple regression analysis for sense of understanding

Variable	R	R-squared	Adj R-squared	Model sig.	Unstd beta	t	Sig
Company A	0.112	0.013	-0.003	0.440			
DF scenario (n = 40)					0.099	0.538	0.591
DS scenario^ (n = 39)					-0.118	-0.690	0.492
HFS scenario (n = 54)							
Company B	0.052	0.003	-0.013	0.836			
DF scenario (n = 38)					0.024	0.124	0.901
DS scenario^ (n = 48)							
HFS scenario (n = 47)					-0.084	-0.459	0.647
Company C	0.062	0.004	-0.012	0.781			
DF scenario (n = 51)					-0.017	-0.083	0.934
DS scenario^ (n = 36)							
HFS scenario (n = 45)					0.108	0.530	0.597

^Reference case
*Significant at the 0.05 level

Finally, as reported in Table 7, a one-way ANCOVA was calculated to examine the effect of the fixed-factor outcome framing on the dependent variable capital allocation, controlling for covariates of perceived risk and sense of understanding. This technique is well-established within the experimental design and determined to be appropriate due to the absence of a strong correlation between the treatment and dependent variables identified as covariates (Hair et al. 2019). In Company A, the capital allocation value reported a significant difference in outcome frame ($F(2, 128) = 4.017$; $p = 0.020$) after controlling for the perceived risk effects and sense of understanding. Perceived risk was a significant covariate ($F(1, 128) = 4.103$; $p = 0.045$), but sense of understanding was not a significant covariate ($F(1, 128) = 2.575$; $p = 0.111$). The comparison of means indicated that the greatest difference in means was between social framing and financial framing. In Company B ($F(2, 128) = 0.338$; $p = 0.714$) and Company C ($F(2, 128) = 0.118$; $p = 0.889$), capital allocation value did not show a significant difference in outcome frame after eliminating the perceived risk effects and sense of understanding, as such covariate analysis was not relevant.

Table 6 ANCOVA for capital allocation

				Pairwise comparison		
Variable	**Sig.**	**Mean**	**Adj. Mean**	**1**	**2**	**3**
Company A						
Perceived risk	0.045					
Sense of understanding	0.111					
Framing scenario	0.020					
1. DF scenario		1.80	1.81	–	-0.479*	-0.120
2. DS scenario		2.28	2.29	0.479*	–	0.359
3. HFS scenario		1.94	1.93	0.120	-0.359	–
Company B						
Perceived risk	0.183					
Sense of understanding	0.864					
Framing scenario	0.714					
Company C						
Perceived risk	0.051					
Sense of understanding	0.029					
Framing scenario	0.889					

*Significant at the 0.05 level

From the above results, it was concluded that the relationships between outcome framing and capital allocation value and risk perception were significant. However, the relationships between outcome framing and sense of understanding were not significant. Thus, the hypotheses were partially supported.

5. Discussion

Using a single-factor between-subjects experimental design, this research studied the relationships between outcome framing and an individual's perception of risk, sense of understanding, and capital allocation decisions in the context of hybrid enterprises. . The research questions were tested by conducting multivariate analysis, and the results showed that the hypothesised relationships between the three constructs could be partially supported. The results suggest that variability in outcome

framing does not affect perceived risk and sense of understanding, but outcome framing influence capital allocation values in a financial choice process.

The study offers empirical support for the influence of outcome framing on capital allocation behaviour in the context of impact investments. Of the three constructs observed in this study, only capital allocation was observed to have an interaction effect with outcome framing. These findings build on the work of Døskeland and Pedersen (2016), Lee et al. (2020) and Linciano et al. (2018). More specifically, the results of this study for Company A replicate findings that social outcome information has a significant influence on the choice process for investments in hybrid enterprises (Brandstetter and Lehner 2015; Mogapi et al. 2019). The risk perception's influence on capital allocation value was expected, as this relationship is well-established in literature (Long et al. 2018). However, this study extends existing research by providing evidence of the influence of perceived risk as a covariant to outcome framing. Recalling the measures for the experiment, responses to the risk perception question indicate an overall perception of low risk in the three companies (2.62) across all treatments and companies. Sense of understanding was generally high (3.79) across all treatments and companies. However, capital allocation values varied by company. Interestingly, this suggests that the observed mean difference in capital allocation values across the companies may be more significantly attributed to the outcome frame than to perceived risk or sense of understanding which is supported in the analysis performed for hypotheses 1, 2 and 3. An alternative point of view to explain the lack of variance in perceived risk and sense of understanding may be the presence of ambiguity-driven indecisiveness, which tends to drive individuals to exhibit a status quo bias (Sautua 2017).

Secondly, the findings substantiate the challenges noted in the literature of assimilating financial and non-financial risk when developing an evaluation of risk for hybrid investments. As Brandstetter and Lehner (2015) suggest, when non-financial risks can be identified, they should be considered more important than financial risk measures. This suggestion is mirrored in the result of this research, as the meaningful differences identified between capital allocation values were between the DF and DS scenarios. In line with the predictions derived from prospect theory (Tversky and Kahneman 1986), this study found that the presentation of outcome information influenced the individual choice. Furthermore, the negative correlation observed between capital allocation and perceived risk supports the established loss aversion theory (Tversky and

Kahneman 1986). This was an important extension of prospect theory to a context where monetary and non-monetary information is considered.

The final contribution of this study related to the relationship between the substance and form of framing variability and the strength of the framing effect. The effect of outcome framing on capital allocation was not consistently replicated across all three companies, indicating a lack of consistency in the strength of the framing effect. The results for Company B and Company C are compatible with prior research, which demonstrated that manipulation in the presentation of company information did not result in a meaningful effect on investor decision-making (Lee et al. 2020). As the company profiles were presented with negligible visual differences, these different scenarios may not have been distinct enough to effect observable changes in perceived risk, sense of understanding, and capital allocation value. Following prospect theory, a distinct reference point is critical for the component of decision strategy (Tversky and Kahneman 1986). In the absence of this obvious reference point, the framing effects may have been muted. While effects were observed for Company A, the overall simplicity of the presentation of the company profiles may have minimised the perceived complexity of the companies, a factor that has been shown to influence perceived risk (Linciano et al. 2018). Furthermore, the economic approach to risk measurement assumes that outcome variance to the reference point is the defining characteristic of perceived risk (Tombu and Mandel 2015). This suggests that there are other factors influencing an impact on investors' risk perception outside of those measured in this study.

The absence of results to support the relationship between perceived risk and sense of understanding counters established literature (Long et al. 2018). This could be due to the unidimensional scale used to measure risk. Encouragingly, the results observed add to existing research by confirming the negative relationship between perceived risk and capital allocation value in impact investments (Long et al. 2018). The data demographics revealed that the sample population had a moderate level of sector experience and meaningful levels of prior investment knowledge and experience. This may have moderated the effects of the variability in framing perceived risk and sense of understanding (Linciano et al. 2018; Wuebker et al. 2015), but there is a lack of consensus in this area. Linciano et al. (2018) and Wuebker et al. (2015) suggested that the effects of the heuristic bias can be moderated by the investment experience and financial literacy. Conversely, Pilaj (2017) and Tversky

and Kahneman (1986) argue that factors such as experience and knowledge do not minimise the framing effects.

5.1. *Limitations and Suggestions for Future Research*

This study acknowledges that the variance in outcomes reported may be due to factors beyond those explicitly tested for in the experiment. Future research could consider a repeat measure design to verify the source of variability (Brown and Melamed 1990). Secondly, due to the time limitations, the information provided within the company profiles was truncated. As such, it served as a signalling mechanism for transparency and did not represent a comprehensive briefing of financial and social outcome information that would be considered an industry standard. Future studies could benefit from more comprehensive information to improve external validity. Furthermore, future research could incorporate a multidimensional scale to improve the robustness of the risk perception construct, specifically in its ability to understand behavioural motivations (Wilson et al. 2019). Finally, using an experimental design and a hypothetical endowment amount for the capital allocation task in simulated environments and real-life decisions may yield different results, thus limiting the ecological validity of these findings (Kahneman and Tversky 1979). Future research could extend ecological validity using a field experiment.

6. Conclusion

This study provides evidence that outcome information framing influences an investor'sdecision-making process in impact investment. The results extend the established theory that information framing influences the decision-making process. Moreover, findings from this study offer evidence that the strength of the framing effect may vary based on the form and substance of the variability. Limited findings on the effects of framing on perceived risk and sense of understanding indicate that other factors may exist in an impact investor's decision-making process. Therefore, further research is required to examine investor evaluation behaviours in impact investment.

References

Agrawal, A. (2018). Impact investing: Framework and future research avenues. *Social Business*, *8*(3), 293–317.

Azmi, W., Mohamad, S., & Shah, M. E. (2018). Nonfinancial traits and financial smartness: International evidence from Shariah-compliant and socially responsible funds. *Journal of International Financial Markets, Institutions and Money*, *56*, 201–217.

Brandstetter, L., & Lehner, O. M. (2015). Opening the market for impact investments: The need for adapted portfolio tools. *Entrepreneurship Research Journal*, *5*(2), 87–107.

Brown, S. R., & Melamed, L. E. (1990). *Experimental design and analysis*.

Døskeland, T., & Pedersen, L. J. T. (2016). Investing with brain or heart? A field experiment on responsible investment. *Management Science*, *62*(6), 1632–1644.

Fatemi, A., Glaum, M., & Kaiser, S. (2018). ESG performance and firm value: The moderating role of disclosure. *Global Finance Journal*, *38*, 45–64.

Forbes, W., Hudson, R., Skerratt, L., & Soufian, M. (2015). Which heuristics can aid financial-decision-making? *International Review of Financial Analysis*, *42*, 199–210.

Hair, J. F., Jr., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Andover, Hampshire: Cengage Learning EMEA.

Hand, D., Dithrich, H., Sunderji, S., & Nova, N. (2020). *Annual impact investor survey*, 10th edition. New York, NY: Global Impact Investing Network. Retrieved June 21, 2020, from https://thegiin.org/research/publication/impinv-survey-2020

Heutel, G. (2019). Prospect theory and energy efficiency. *Journal of Environmental Economics and Management*, *96*, 236–254.

Höchstädter, A. K., & Scheck, B. (2015). What's in a name: An analysis of impact investing understandings by academics and practitioners. *Journal of Business Ethics*, *132*(2), 449–475.

Holzmeister, F., Huber, J., Kirchler, M., Lindner, F., Weitzel, U., & Zeisberger, S. (2020). What drives risk perception? A global survey with financial professionals and lay people. *Management Science*, *66*(9), 3977–4002.

Hornsby, A., & Blumberg, G. (2013). *The good investor: A book of best impact practice*. London: Investing for Good.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*(2), 263–292.

Kirk, R. E. (2012). Experimental design. In I. Weiner, J. A. Schinka, & W. F. Velicer (Eds.), *Handbook of psychology* (2nd ed., pp. 23–45). Hoboken: Wiley.

Lee, M., Adbi, A., & Singh, J. (2020). Categorical cognition and outcome efficiency in impact investing decisions. *Strategic Management Journal*, *41*(1), 86–107.

Lehner, O. M., Harrer, T., & Quast, M. (2019). Building institutional legitimacy in impact investing: Strategies and gaps in financial communication and discourse. *Journal of Applied Accounting Research*, *20*(4), 416–438.

Linciano, N., Lucarelli, C., Gentile, M., & Soccorso, P. (2018). How financial information disclosure affects risk perception. Evidence from Italian investors' behaviour. *The European Journal of Finance*, *24*(15), 1311–1332.

Lipe, M. G. (2018). Unpacking the disclosure package: Using experiments to investigate investor reactions to narrative disclosures. *Accounting, Organizations and Society*, *68–69*, 15–20.

Long, A. R., Fernbach, P. M., & De Langhe, B. (2018). Circle of incompetence: Sense of understanding as an improper guide to investment risk. *Journal of Marketing Research*, *55*(4), 474–488.

Markowitz, H. M. (1999). The early history of portfolio theory: 1600–1960. *Financial Analysts Journal*, *55*(4), 5–16.

Markowitz, L., Cobb, D., & Hedley, M. (2012). Framing ambiguity: Insider/outsiders and the successful legitimation project of the socially responsible mutual fund industry. *Organization*, *19*(1), 3–23.

Mogapi, E. M., Sutherland, M. M., & Wilson-Prangley, A. (2019). Impact investing in South Africa: Managing tensions between financial returns and social impact. *European Business Review*, *31*(3), 397–419.

Nicholls, A. (2009). "We do good things, don't we?": "Blended Value Accounting" in social entrepreneurship. In *Accounting, Organizations and Society* (Vol. 34, Issues 6–7, pp. 755–769).

Nicholls, A. (2010). The institutionalization of social investment: The interplay of investment logics and investor rationalities. *Journal of Social Entrepreneurship*, *1*(1), 70–100.

O'Donohoe, N., Leijonhufvud, C., Saltuk, Y., Bugg-Levine, A., & Brandenburg, M. (2010). *Impact investments: An emerging asset class*. New York City: JPMorgan Chase & Co., The Rockefeller Foundation, and Global Impact Investing Network.

Phillips, S. D., & Johnson, B. (2019). Inching to impact: The demand side of social impact investing. *Journal of Business Ethics*. https://doi.org/10.1007/s10551-019-04241-5

Pilaj, H. (2017). The choice architecture of sustainable and responsible investment: Nudging investors toward ethical decision-making. *Journal of Business Ethics*, *140*, 743–753.

Santos, F., Pache, A.-C., & Birkholz, C. (2015). Making hybrids work: Aligning business models and organizational design for social enterprises. *California Management Review*, *57*(3), 36–58.

Sautua, S. I. (2017). Does uncertainty cause inertia in decision making? An experimental study of the role of regret aversion and indecisiveness. *Journal of Economic Behavior & Organization*, *136*, 1–14.

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, *19*(3), 425–442.

Tombu, M., & Mandel, D. R. (2015). When does framing influence preferences, risk perceptions, and risk attitudes? The explicated valence account. *Journal of Behavioral Decision Making*, *28*(5), 464–476.

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, *211*(4481), 453–458.

Tversky, A., & Kahneman, D. (1986). Rational choice and the framing of decisions. *The Journal of Business*, *59*(4), S251-S278.

Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty*, *5*(4), 297–323.

Vo, A. T., Christie, C. A., & Rohanna, K. (2016). Understanding evaluation practice within the context of social investment. *Evaluation*, *22*(4), 470–488.

Vo, N. N. Y., He, X., Liu, S., & Xu, G. (2019). Deep learning for decision making and the optimization of socially responsible investments and portfolio. *Decision Support Systems*, *124*, 113097.

Wang, M., Keller, C., & Siegrist, M. (2011). The less you know, the more you are afraid of: A survey on risk perceptions of investment products. *Journal of Behavioral Finance*, 12(1), 9-19.

Wilson, R. S., Zwickle, A., & Walpole, H. (2019). Developing a broadly applicable measure of risk perception. *Risk Analysis*, *39*(4), 777–791.

Woike, J. K., Hoffrage, U., & Petty, J. S. (2015). Picking profitable investments: The success of equal weighting in simulated venture capitalist decision making. *Journal of Business Research*, *68*(8), 1705–1716.

Wuebker, R., Hampl, N., & Wüstenhagen, R. (2015). The strength of strong ties in an emerging industry: Experimental evidence of the effects of status hierarchies and personal ties in venture capitalist decision making. *Strategic Entrepreneurship Journal*, *9*(2), 167–187.

Supplemental Materials

Exhibit A: Task Briefing and Instructions

Globally, over 850 million people are still without access to electricity.[1] Energy demand is expected to continue to rise by around 1% per year until 2040.[2] At least half of this demand is expected to be met through cost-effective solar photovoltaic (PV) energy.[3]

You have consented to participate in an experiment focused on understanding investor decision-making preferences. The experiment consists of three sections: (1) participant information, (2) company information, and (3) investment allocation. The first section will ask you to provide information on your demographics, investment experience, and risk tolerance. Thereafter, you will be provided with company profiles for three hybrid enterprises in the PV energy industry. You will review the profiles and provide feedback on your level of understanding and risk perception for each enterprise. In the final section, you will be required to allocate a fictitious financial endowment of USD$2 000 across the three enterprises.

[1]International Energy Agency. (2019). *World Energy Outlook 2019*. Retrieved July 17, 2020, from https://www.iea.org/reports/world-energy-outlook-2019#

[2]International Energy Agency. (2019). *World Energy Outlook 2019: Executive summary*. Retrieved July 17, 2020, from https://iea.blob.core.windows.net/assets/1f6bf453-3317-4799-ae7b-9cc6429c81d8/English-WEO-2019-ES.pdf

[3]Ibid.

Exhibit B: Outcome treatments

	Dominant financial framing (scenario 1)	**Dominant social framing (scenario 2)**	**Hybrid framing (scenario 3)**
Solar Solutions (Company A)	Treatment A1	Treatment A2	Treatment A3
Smart Solar (Company B)	Treatment B1	Treatment B2	Treatment B3
PV Projects (Company C)	Treatment C1	Treatment C2	Treatment C3