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## Does transaction atmosphere influence the decision-making behaviour of investors?

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### ABSTRACT

The profitability of impact investments ranges from a return on investment to market returns. To accomplish social goals, certain investors forgo part of the financial return. This approach opposes the concepts of conventional finance theory, which see the individual as a rational profit-maximizing decision-maker. A quantitative experimental study was conducted with students from the Upper Austria University of Applied Sciences, Steyr Campus, whereby the subjects were divided into two groups. A social Transaction Atmosphere (TA) was created in one group through the targeted use of stimuli. Subsequently, both groups had to make an investment decision in an identical scenario. The aim of the study and point of intersection between transaction cost theory and the social finance (SF)/impact investing (II) area is to analyse the observable "irrationality" in SF/II with reference to the transaction atmosphere as the primary decision-making element. The underlying scientific question investigates the impact of a socially shaped TA on the decision-making of investors. Experiment results demonstrated that the use of stimuli significantly raised the proportion of impact investments to overall investments. This finding suggests that a socially moulded TA is essential for investors' decision-making, whereby receptivity to the stimuli depends on individual investor characteristics, such as moral standard, financial knowledge, and previous experience with investment decisions. The financial aspect continues to play an important role in the decision-making process of investors.

## Introduction

Due to the recent financial crisis, prevailing financial market mechanisms are being questioned, particularly the effectiveness of assessing risks and distributing capital (Martin, 2016). Traditional financial theory builds on the assumption of rationality of actors, market efficiency and the primary goal of achieving a financial return (Fama, 1970). However, the world is currently facing a transformation of global economies. This development is the underlying idea of consciously focusing on achieving financial and social returns. Social finance (SF) aims to

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optimise global capital availability and distribution through innovative approaches, such as microfinance, social impact bonds, social enterprises and venture philanthropy (Nicholls & Emerson, 2015).

A venue of this paradigm shift is the investment sector. Efficient capital use can finance projects that address environmental, social and societal issues while receiving financial returns. The Global Impact Investing Network (GIIN) defines impact investing (II) as ‘investing in companies, organizations and funds with the intent to generate social and environmental added value in addition to a financial return’ (GIIN, 2017). This area of SF defies the traditional view that solving social and societal problems is solely the task of philanthropic organisations and that the focus of market investments is purely financial (GIIN, 2017). Certain investors purposefully accept a reduction in the profitability of investments to achieve a social impact (Auer & Schuhmacher, 2016; Beal, Goyen, & Phillips, 2005; Paetzold, 2017; Salaber, 2007).

In the II area, investors accept a low financial performance to ensure their social goals. From the perspective of conventional financial theory, investors in II reflect irrational behaviour. This observed investment behaviour corroborates the fact that traditional financial models, such as the capital asset pricing model, are outdated. This phenomenon holds because such financial models cannot fully evaluate investments as non-financial aspects are not considered. However, these financial models are widely used in practice. This ignorance leads to a discrepancy between the established financial theory and the observable apparent ‘irrationality’ in the social investment market.

We explain this disparity by applying transaction cost theory (TCT) (Williamson, 1981). TCT deals with the question of how transactions, including service relationships, can be handled most efficiently. Accordingly, factors that may affect costs in the course of transactions are analysed (Williamson, 1981). In addition to the specific characteristics of a transaction and the underlying behavioural assumptions of the actors, Williamson (Williamson, 1975) also considered the so-called transaction atmosphere (TA) that influences these costs. TA includes non-financial factors that affect the prevailing context of a situation and thus the decision-making of individuals (Müller, 2005; A Picot, Dietl, & Franck, 1999).

The literature has paid little attention to the concept of TA thus far. Nevertheless, the influence of non-financial factors has already been discussed in various disciplines, though under different terms. These advanced theories are behavioural economics with the concept of cognitive bias (Beck, 2014; Camerer, 2011; Tversky & Kahneman, 1974). Behavioural economics is the field of narrative economics that explains the influence of narratives on people’s day-to-day decisions (Morley, 2006; Shiller, 2017), legitimacy (Lehner, Harrer, & Quast, 2018; Schoonhoven, 2015; Suchman, 1995) and sociology with social norms and values (Schäfers, 2016; Weber, 2002). Although the individual definitions and applications of these constructs significantly differ, they all describe the context into which a transaction is embedded as a central factor that influences individuals’ behaviour. The fields of behavioural economics, legitimacy and sociology have undergone comprehensive scientific investigation. In contrast, the fields of narrative economics and TA were covered only to a minor extent in the literature.

The purpose of this study is to explain the observable irrationality in investment decisions by applying TCT, particularly focusing on the overlooked TA. The aim is to investigate whether investors’ decision-making behaviour changes when social values and convictions are conveyed in TA. Thus, this study addresses the following research questions:

1. Does TA influence investors' decision-making behaviour?
2. What is the influence of a socially loaded TA on investors' decision-making behaviour?

With this study, we can explain the claimed irrationality of investor behaviour. Results may improve capital allocation in the context of social investment by comprehensively understanding the underlying mechanisms. Additionally, further insights into the influence of non-financial factors can be gained, which can be used to adapt existing financial models and theories.

To answer the scientific question, the theoretical chapter explains the underlying theories. In addition to a description of the present state of research, the context of a transaction is examined in greater depth. At the conclusion of the theoretical chapter, hypotheses are created based on the gained insights. In the chapter on methodology, the characteristics, benefits and drawbacks of the chosen research method, namely the experiment, are discussed. Additionally, the experimental design and its implementation is described in detail. In the empirical section, the analysed data are described. After providing an overview of the socio-demographic structure of the data, the hypotheses are tested.

In the discussion, we interpret our presented results, compare them with the current state of research and derive relevant implications for science and practice. The summary section describes the limiting factors and future research topics.

## **Theoretical considerations**

This chapter provides an overview of the relevant theoretical framework. The TCT is the linchpin of the underpinning theory. Challenges and phenomena associated with the II sector are then recognised, resulting in a mismatch with conventional analytical frameworks. The application of the ideas ought to aid in the comprehension of investor behaviour.

### *Transaction Cost Theory*

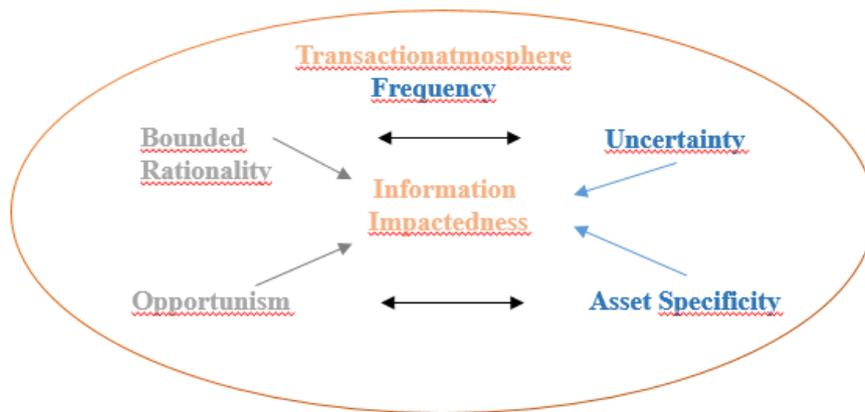
TCT deals with 'transactions and the costs associated with conducting transactions through a particular institutional form' (Williamson, 1975). TCT focuses on the effectiveness of vertical integration (transaction within a firm) and market control (transaction outside the firm) (Geyskens et al., 2006 (Geyskens, Steenkamp, & Kumar, 2006; Rindfleisch & Heide, 1997);

TCT combines the aspects of economics, organisational theory, and contract theory in an interdisciplinary approach (Williamson, 1979). The transaction represents the basic unit of economic analysis.

Coase (1937) refers to costs arising from market use as marketing costs. These costs relate to the determination of relevant prices and the initiation and execution of contracts. The organisation enables the partial saving of these costs. Following Coase's concept, the formation of an organisation becomes reasonable when the costs for the internal coordination of an additional transaction are equal to the costs for outsourcing the same transaction to the market or another organisation (Coase, 1937).

Transaction costs are incurred in seeking a transaction, gathering information, creating, and negotiating a contract and ensuring compliance with the agreement. After finalising the agreement, costs are incurred in evaluating the input and output, monitoring and enforcing (Williamson, 1985). The question of why these costs arise is addressed by limited information, existing uncertainty, and the opportunistic behaviour of the negotiating parties.

Williamson (1975) developed a micro-analytical framework of reference to systematise and explain transactions. Transaction costs depend on certain determinants. Thus, Williamson (1975) developed the so-called organisational failure framework (see Figure 1) to explain the relationships between these determinants and the respective role of transaction costs.



- ... behavioral assumptions
- ... other influencing factors
- ... environmental factors

**Figure 1.** Organisational Failure Framework; following (A. Picot, Dietl, & Franck, 2002); Williamson, 1975)

Transaction atmosphere

As the primary pillar of our study, the concept of TA is examined in detail below.

When discussing TA, Williamson (1975) refers to all socio-cultural, legal, and technological factors that can impact transaction costs. In addition to highly efficient information and communication technologies, a stable legal framework is included because a high level of security in the economic environment leads to low transaction costs (Gerling, 1997).

Williamson assumes that actors do not consider transactions exclusively from a purely analytical, rational point of view. He presumes that economists rationalise human behaviour largely through cost-benefit analysis and consequently pay little attention to less tangible concepts, including TA (Williamson, 1973). Williamson postulates the consideration of non-monetary components by distancing from the purely calculated approach of traditional economic theory and including non-monetary factors in conventional economic considerations (Baudry & Chassagnon, 2010).

According to Picot and Dietl (1999), TA encompasses all social and technological conditions that influence transaction costs. For example, technological advances can influence the bounded rationality of the actors or the specificity of a transaction. For example, modern technologies for processing substantial data can reduce transaction costs related to individuals' limited cognitive abilities. As mentioned above, Williamson defines the concept of TA as certain interdependencies between transactions. In doing so, he is strongly oriented towards the human relations school of thought that views organisational goals not only as economic viability but also as the holistic satisfaction of the needs of employees. Moreover, the theory holds that a distinction must be made between formal and informal organisations. A formal organisation is defined as a system with at least two individuals who rely on conscious coordination of activities (Barnard, 1938). This characteristic distinguishes formal organisations from informal organisations, which includes social contacts, relationships and groups formed by organisation members (Barnard, 1938). Furthermore, an organisation is to be regarded as a social unit with interdependent parts. Formal and informal organisations also represent the two views of organisation members, namely the views of productivity and feelings. Therefore, employees are influenced not only by economic but also by non-economic incentives. Therefore, TA is closely linked to the human relations school of thought (Baudry & Chassagnon, 2010; Williamson, 1973).

TA is characterised by factors such as shared values, views, attitudes and the socio-cultural context of a transaction (v. Werder, 2011). It can be concluded that TA is significantly influenced by the overall attitude of a certain group of people in an organisation or market and not by separate individuals. The interpersonal dynamics in social systems (e.g., discourse between individuals) also influence the prevailing atmosphere. Thus, TA enables a holistic view of individual problems.

In addition to prices, factor specificity and contract security are also transactional instruments. These instruments are also threatened by opportunistic behaviour. The atmosphere of a transaction must give positive signals for the provision of the promised service. From an institutional economics perspective (Müller, 2005), TA is an incentive and sanction variable that has to be designed relative to the initiation, settlement and control of a transaction. It forms an institutional, formal and informal framework within which transactions can be negotiated and executed completely (Beschorner, 2002; Wieland, 1996).

One of the design parameters of TA is trust (Wieland, 1996; see also (Chiles & McMackin, 1996; Collin, 1993; Larsson, 1993). Researchers attribute a transaction cost-reducing effect to TA (Hosmer, 1995). Ripperger (Ripperger, 2003) states that TA represents a social system of social norms that protects trust. Institutional incentives and sanctions are intended to reduce the probability of opportunistic behaviour.

### *Social Finance*

The SF sector represents a promising opportunity to revise the undesirable developments in our global economic systems. Although a precise definition is almost impossible due to the extensive areas of validity and application, it can be roughly stated that SF has the intention of providing the necessary resources to generate social value.

Social, demographic and environmental developments bringing in hybrid businesses with social and economic goals have created the need for innovative financing sources to develop and implement innovative solutions to social challenges (Barbosa-Vargas, Hossain, & Mendell, n.d.; Bugg-Levine & Emerson, 2011). Jones (Jones, 2010) defines

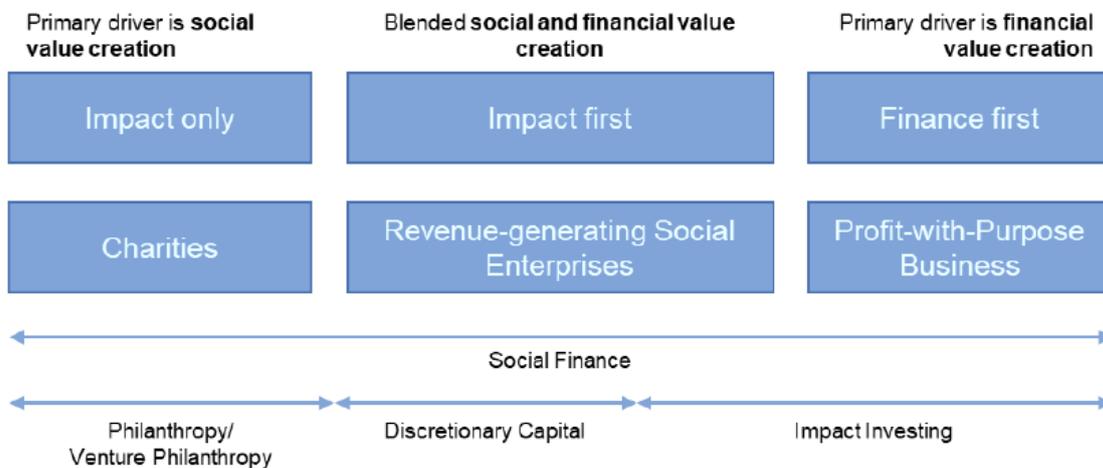
impact investment as investments aimed at making a profit to solve social and environmental problems. The GIIN, which is the largest group of II shareholders and asset managers, employs a similar definition and defines II as ‘investing in companies, organizations and funds with the intention of socially and environmental added value alongside a financial return’ (GIIN, 2017; Martin, 2013)

Following the hybrid business logic of recipients, the focus of social impact investments extends beyond pure financial risks and returns. Rather, they intentionally target specific social objectives along with a financial return and measure the achievement of both. SII pursues the goal of linking positive social impacts with capital allocation (Benford, Birnbaum, & Dombrowski, 2014; Bugg-Levine & Emerson, 2011; Huang, Salib, Clark, Hixon, & Li, 2014; Oleksiak, Nicholls, & Emerson, 2015).

Although II has various definitions, its major part is grounded in three basic principles as follows (Geobey & Weber, 2013; GIIN, 2017; Lehner, 2016):

1. II pursues hybrid goals; thus, investments can and should consciously achieve financial and social returns.
2. II promotes a sustainable financial return to secure the long-term existence of SF institutions.
3. II measures and reports on the social and environmental benefits that have been achieved to ensure maximum transparency.

The three principles above distinguish II from traditional investing as it pursues financial returns only. In contrast, differences to other trends also exist within SF (see Figure 2 below).



**Figure 2.** Range of SF (Nicholls & Emerson, 2015)

Compared with charities and the non-profit sector, II offers the advantage of more efficient capital use as it provides returns to the investor, including financial returns. Thus, in II, social and financial returns are not mutually exclusive and can be maximised simultaneously. This approach offers great potential for finding sustainable solutions to environmental and social problems without sacrificing financial returns.

Impact investments differ from those traditional investments due to their hybrid goals (Doherty, Haugh, & Lyon, 2014; Lehner, 2011; Wilson & Post, 2013). A supportive ecosystem combining social missions with commercial activities has not been created. Thus, hybrid organisations combine social and commercial goals to avoid mission drift (Battilana, Lee, Walker, & Dorsey, 2012; Lehner, 2013).

The measurement of the social value of investments is an integral part of II (GIIN, 2017; (Taskforce, 2014). Traditional financial analysis models have limited assessment methods for impact investments. Therefore, a standardised measurement of the environmental and social impacts of such investments will be important for future models. Measuring the potential social and environmental impacts of social investments using commonly accepted methods is a crucial factor of new concepts because II consciously pursues quantifiable social and financial returns (Brandstetter & Lehner, 2015). Investors, intermediaries, governments and social businesses strive for industry-wide measurement metrics that are standardised, predictable and verifiable (Brandstetter & Lehner, 2015). Measurement systems used include the social return on investment (SROI), the Impact Reporting and Investment Standards (IRIS) (Network, 2009), the Global Impact Investing Rating System (GIIRS) (Jackson, 2013) and the US-based B Impact Assessment powered by B Lab (Jackson, 2013). B Lab is a US-based non-profit organisation whose mission is to use business as a force permanently. Its vision is to enable all companies to compete not only to become the best in the world but also to be the best for the world. As a result, society will benefit from shared and durable prosperity. B Impact Assessment provides authentic, comprehensive, transparent, and independent standards for social and environmental performance. Thus, companies can assess their overall impact. Publicly available benchmarks and tools help companies to improve their impact (see <https://bimpactassessment.net/>).

In analogy to the economic equivalent of return on investment, SROI is a metric based on cost–benefit analysis. The monetised social costs of an investment are compared with the social benefits of an outcome, also valued in monetary units (Arvidson, Lyon, McKay, & Moro, 2013; Cordes, 2017). IRIS created a taxonomy that standardises social impact reporting that enables the development of industry benchmarks. GIIRS applies IRIS’s definitions and additional data to determine the relative value of the social performance of investments. The use of such definitions assists in investment decisions and leads to low investment screening costs by compiling standardised information on investments (O’Donohoe, Leijonhufvud, Saltuk, Bugg-Levine, & Brandenburg, 2010; Tekula & Shah, 2016).

Research explores how funders and investors review and evaluate the financial sustainability and social impact of firms (Barnett & Salomon, 2006; Lyons & Kickul, 2013; Nofsinger & Varma, 2014; Revelli & Viviani, 2015). Certain authors view financial risks as serious obstacles to social innovation and call for mechanisms of risk reduction. However, none of the currently used traditional financial models takes the total associated risk considering the creation of a social value. The same holds for statistical dependencies between individual risk and revenue parameters. Brandstetter and Lehner (2015) first responded to this issue by suggesting a tool that is adapted to the previously mentioned requirements (including social risks and returns) and integrates the risk and return parameters of social investments into the traditional logic of portfolio optimisation. Investors have developed different strategies to reduce the associated risk of social investments and consider non-financial criteria in their investment decisions. These strategies include norms-based screening, active ownership, positive screening and ESG integration (Eurosif, 2016).

*Theoretical model to justify the observable discrepancy between traditional finance theory and SF*

The authors use Levitt and List's (Levitt & List, 2007) model to approach the observable discrepancy between traditional finance theory and the SF field from a theoretical perspective. This utility maximisation model defines two aspects that influence individual decision-making: monetary and moral aspects. In Levitt and List's model, an individual  $i$  is confronted with a choice concerning a specific action  $a$ . The corresponding action impacts its utility  $U$ , whereby the individual benefit can be subdivided into a property component  $W$  and a moral component  $M$ .

Regarding the first aspect, the higher the monetary value of an action  $v$ , the greater the impact of action  $a$  on asset component  $W$ . Isolated  $W$  represents a function of maximising risk-adjusted returns, similar to that in the traditional financial theory. The second aspect is the non-financial moral benefits or costs  $M$  incurs by action  $a$ . Moral component  $M$  is also dependent on the corresponding action  $a$  and monetary value  $v$ . This model also considers financial externalities resulting from the corresponding action  $a$  on others. The greater the negative impact on others, the greater the moral costs  $M$ . The financial externalities increase in the model with a higher monetary value  $v$ . The moral component  $M$  is also influenced by social norms and legal rules for or against a particular action, which are defined as  $n$ . For example, an illegal act involves additional moral costs. The stronger the norms and rules that prevail in a society, the greater are the moral benefits or moral costs. Finally, moral component  $M$  is also influenced by the nature and extent of the review of the action  $s$ . For example, when an action is performed under experimental observation in front of one's own children or on television impacts the moral component, the moral benefits and costs increase with a higher level of  $s$  (Døskeland & Pedersen, 2015; Levitt & List, 2007). Therefore, the utility function for  $i$  is as follows:

$$U_i(a,v,n,s) = W_i(a,v) + M_i(a,v,n,s)$$

The model returns to a traditional function of yield maximisation. When an action is accompanied by a moral aspect, an individual will choose the action with great moral value or moral cost. Such an action would be selected from a purely financial point of view. Deviation from the action increases with existing social norms and legal rules as well as with the level of action review. Levitt and List mention that individuals make a trade-off in their decisions between the financial and moral aspects. However, individuals have different moral standards, which may result in differences in their choices for one object and similarities for another. In principle, as the monetary value of the action increases, the financial aspect of the function is expected to gain more importance, though not in all cases (Levitt & List, 2007).

*Summary of the theoretical discourse*

SF aims for a positive change in the financial and economic systems. Investors consciously aim to achieve a financial return and social impact. In addition, II focuses on a sustainable orientation of projects and the targeted measurement of the achieved impact of the respective projects. Impact investments can yield market-standard returns but can also lead to reduced financial profits. Certain impact investors can secure the achievement of a social impact through low profitability of the projects. Based on the rationality and profit maximisation intention of the actors, this

willingness of investors to forgo part of the financial return is contrary to the existing logic in the traditional financial sector. From a traditional perspective, the described behaviour of impact investors is irrational. This concept is also strengthened by the continued use of traditional financial models to assess impact investments. Although initial efforts to adapt these models are already recognisable, none of them has fully captured the financial and social dimensions of SF and II.

TCT deals with the choice of organisational form of service relationships, which can be handled either internally (hierarchy), externally (market) or as a hybrid. Transaction costs incurred in performing service relationships are influenced by the underlying behavioural assumptions of the TCT and respective transaction characteristics. Another influencing factor is TA, describing the less tangible interdependencies between individual transactions, such as shared settings and values. TA extends TCT with a non-financial component.

The aim of this study and the point of intersection between TCT and the SF/II area is that the observable irrationality is analysed with reference to TA as a central influencing factor for decisions. This paper justifies the extent to which the prevailing atmosphere influences investors' decision-making behaviour. Thus far, little attention has been paid to the social component of investment. Modern investors consider non-financial features in their decisions in addition to financial aspects. Combined with this new generation of investors rethinking investment and reconsidering the role of external factors, such as personal values and attitudes in the context of investment, are necessary (Derwall, Koedijk, & Ter Horst, 2011).

Based on the research questions and the findings of the literature, the following main hypothesis is proposed:

Null hypothesis (H0): Social TA and investors' decision-making behaviour are not significantly correlated.

The hypothesis corresponds to the fundamental, scientific question of the paper that aims to investigate the influence of TA on investment decisions. Can a socially influenced TA deliberately place the social aspect in the foreground? Further hypotheses are proposed, which are related to H0 and are verified by experiment:

Hypothesis 1 (H1): The stimuli used to consciously manipulate the social-shaped TA influence the decision-making behaviour of investors to varying degrees.

Hypothesis 2 (H2): Financial product ownership changes the influence of a social TA on investors' decision-making behaviour.

## **Methods**

The preceding chapters have established this work's theoretical framework. The next step is to conduct an experiment to determine the effect of the TA on the observed disparity between traditional financial theory and the II area. In the following sections, the experiment as a research method, the accompanying data evaluation, and the organisation of the actual experiment is described in detail.

### *Experimental research*

The hypotheses are to be tested by a decision–theoretical experiment, which can be assigned to experimental economic research. This study design is selected because decision theory deals with the systematic study of the decision-making behaviour of individuals and groups (Laux, Gillenkirch, & Schenk-Mathes, 2012). Experiments for testing a theory are an analytical simplification of a concrete phenomenon (Morris, 2014). They are a recognised research method and are defined as an independent research design. Moreover, experimentation is the only research method that generates conclusions about cause–effect relationships. It examines the response of one variable to a change in another (Ebster & Stalzer, 2017). The controlled manipulation of independent variables allows the investigation of the effects on dependent variables. As a result, phenomena and theories which are difficult to test using field data can be examined (Eckel, 2014). To examine possible causal relationships, an experiment must be structured in such a way that allows one group to be exposed to a certain incentive, a so-called stimulus, whereas the other group is not. In research, the terms experimental group (EG) and control group (CG) are also common (Ebster & Stalzer, 2017).

### *Operationalisation*

A laboratory experiment was conducted in April 2018 with undergraduate students enrolled in management study programmes at the University of Applied Sciences Upper Austria, Steyr Campus. In total, 167 subjects participated in the experiment. The ratio of men to women was relatively balanced at 53% to 47%. The age structure ranges from 18 to 42 years, with an average of 24 years. A total of 59% of the subjects said they had no financial products.

Traditional financial theory and the SF/II area in the literature on different return philosophies of investors show a discrepancy. Accordingly, the experiment primarily aims to analyse the influence of TA on investors' decision-making. Thus, two key variables are used for this study: TA and investor decision-making as independent and dependent variables, respectively.

As part of the experiment, the subjects had to assume the position of an investor pursuing a new investment. Table 1 shows six investment options. The investors must select an investment with three financial metrics visible for each investment, namely return, volatility and the Sharpe ratio. The key figures were explained to ensure that the subjects understand them. In addition, a symbol classification was introduced. The investments can be classified either with a fire symbol, a tree symbol or without a symbol. The fire symbol represents investments made in controversial industries, such as the tobacco, alcohol, and arms industries. The tree symbol represents investments that consciously pay attention to sustainable and responsible investments, namely impact investments. An investment without a symbol is neither a controversial industry investment nor a sustainable investment.

**Table 1.** Investment opportunities

Option	Investment		Return per year	Volatility per year	Sharpe ratio
	Investment 1		5,00%	3,50%	1,14
	Investment 2		8,50%	6,00%	1,25
	Investment 3		6,25%	4,50%	1,16
	Investment 4		2,50%	1,75%	0,86
	Investment 5		5,50%	4,25%	1,06
	Investment 6		3,25%	2,75%	0,82

To manipulate deliberately the TA, incentives were set during the experiment to highlight the social component of II. As a result, a socially coined TA could be generated. The stimuli were used either in the form of a video, a text or a combination (video and text). The selected video (source: <https://www.youtube.com/watch?v=9U79OrfCwEk>) addresses the concept of II and explains its inherent potential, in addition to the sustainable counteraction of an attractive investment and global aberrations. If a text was used as an incentive, then the subjects received additional information on the investments classified as impact investments. The information described the characteristics of such investments (e.g., contribution to a fair economy, possible market returns, best ethical profile in the sector) and market trends and the prevailing norms and values of other investors.

On average, investments in controversial industries show the best risk/return ratio as measured by the Sharpe ratio. In contrast, impact investments have the lowest return/risk ratio on average. Based on the Sharpe ratio, ‘neutral’ investments are located between controversial industry investments and impact investments. According to traditional finance theory, investments with the highest Sharpe ratio must be selected. In the experiment conducted, these investments are those in controversial industries. Regarding Levitt and List’s (2007) model, further factors should be considered. The deliberate manipulation of a socially influenced TA with the stimuli described above aims to influence the subjects’ perceptions of the moral component, that is the prevailing norms and values, as well as the positive externalities that can be associated with II.

First, the subjects were divided into two groups: EG and CG. The EG was further subdivided according to the stimuli used. Following the requirements of an experiment, the CG was not exposed to any stimulus. Finally, four groups were formed:

- EG 1: combined stimulus (video and text)
- EG 2: video as a stimulus
  
- EG 3: text as a stimulus
  
- CG: no stimulus

The participating students were randomly assigned to individual groups.

The statistics and analysis software SPSS is used to evaluate the collected data. However, the analysis of the derived hypotheses cannot be performed based on a mean comparison because the variables used are not normally distributed. Thus, a descriptive depiction and interpretation using crosstabs are provided. The verification of statistically significant differences between the analysed variables is performed using a chi-square test.

**Empirical findings**

In this paper's empirical part, the laboratory experiment findings and statistical analysis are presented.

*Sociodemographic structure of the data*

The experiment was conducted over three days at the end of April 2018 with students from the Upper Austria University of Applied Sciences, Steyr Campus. There were a total of eight distinct groups from various degree programmes, encompassing different semesters and full-time and part-time degree programmes.

Personal data from the subjects were requested, such as age, sex, degree program or possession of financial products. To consider the monetary aspect required in experimental economic research, a chance of winning was implemented for all subjects. This reward was directly related to the investment decision made. Each participant was provided with a fictitious investment amount of €10, which could be put on one of the investments. This stake was weighted with the Sharpe ratio of the selected investment to consider its risk. The weighted mission was raffled and paid out three times among all the subjects.

The CG exposed to no stimulus comprised 33 subjects. The proportion of women in this group is approximately 42%, slightly lower than in the overall sample; the average age is 23 years; and approximately 39% of this group owns financial products. By comparison, the total sample (the total of all three EGs) exposed to one stimulus included 134 subjects. The average age is 25 years, 49% of and 41% of whom are women and possess financial products (see Table 2).

**Table 2.** Socio-demographic data

	In total	CG	EG in total	EG 1	EG 2	EG 3
Number of subjects	167	33	134	41	64	29
Age	24,44	22,88	24,83	23,63	25,00	26,14
Proportion of women	0,473	0,424	0,485	0,585	0,578	0,138
Possesion of financial products	0,406	0,387	0,410	0,390	0,406	0,448

*Results on the Influence of the Socially Influenced Transaction Atmosphere*

Subsequently, the influence of a social TA on investors' decision-making behaviour is analysed, and the main hypothesis is examined. First, the selected investments divided into investments with or without stimulus are presented in Table 3. The biggest change occurs in investment 3, which was selected without stimulus by more than

half of the subjects. After the stimulus, only about a quarter of the subjects were selected. Investments 4 and 1 only made a marginal change in the total investment share (1.5% vs. -2.3%), whereas investment 2 significant increases by 5.1%. However, investments classified as impact investments showed the largest increase. None of the subjects selected investment 6 without stimulus, whereas approximately 10% of the subjects in the EGs chose this investment. The increase is stronger only in investment 5. In the CG, around one-third of the subjects have opted for this investment. After the stimulus has been set, the share of this investment in the total investment rises to nearly half of all the subjects.

**Table 3.** Investment amounts made in the total investment with or without stimulus

	<b>Inv. 1</b>	<b>Inv. 2</b>	<b>Inv. 3</b>	<b>Inv. 4</b>	<i>Inv. 5</i>	<i>Inv. 6</i>
<b>Stimulus</b>	<b>no</b>	<b>6,1%</b>	54,5%	0,0%	<i>33,3%</i>	<i>0,0%</i>
	<b>yes</b>	<b>3,7%</b>	<b>11,2%</b>	23,9%	<i>49,3%</i>	<i>10,4%</i>
absolut Delta value	-2,4%	5,1%	-30,6%	1,5%	16,0%	10,4%

Note: Investments in controversial industries and impact investments are bolded and italicised, respectively. Investments 3 and 4 are neutral; they are neither located in controversial industries nor have a conscious focus on sustainable investment.

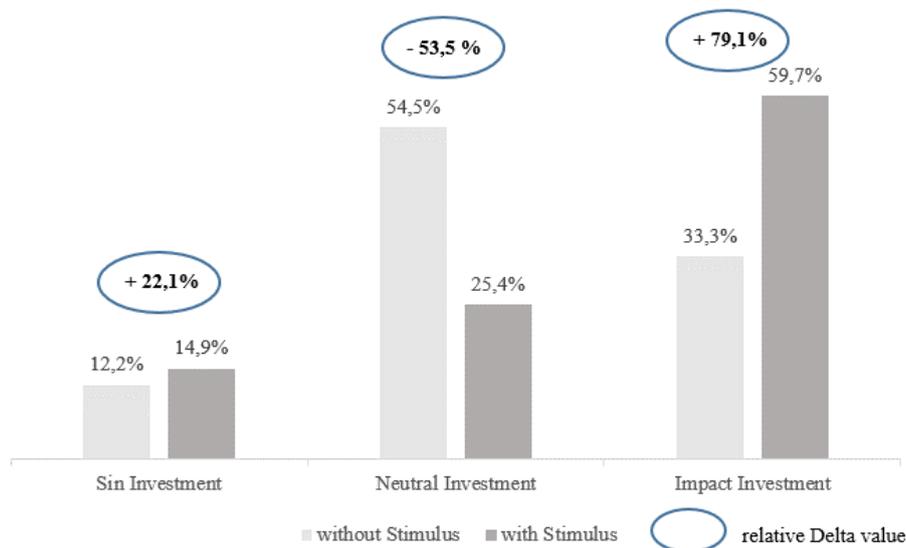
The chi-square test is used to check the statistical relationship between the nominal (investment) and dichotomous (stimulus) variables, resulting in a statistical significance level of 97.5% ( $p = 0.012$ ). In this case, the cell frequency required for the chi-square test is not provided as more than 40% of the cells have an expected frequency of less than 5, indicating a statistical blurring. To counteract this tendency, the six different investment options are classified into three subgroups as follows:

- Sin investments (investments 1 and 2)
- Neutral investments (investments 3 and 4)
- Impact investments (investments 5 and 6)

A new dichotomous variable was stored in SPSS for each group. The variable determines whether the investment is a sin, neutral or impact investment. Subsequently, the chi-square test was performed again, resulting in a significance level of 99% ( $p = 0.005$ ). Therefore, the social TA statistically significantly influences the investment decisions made by the subjects. By categorising the six investment opportunities into three groups, the requirement of the chi-square test for the expected frequencies per cell is satisfied. Then, Cramér’s V was calculated to measure the strength of the relationship, resulting in a value of 0.254 indicating a moderate relationship between the variables.

The analysis shows a statistically significant link between the stimulus and investments made. The next step is a detailed analysis of the subjects' decision-making behaviour regarding their investments. The effects of a stimulus on each of the previously defined three groups were investigated and statistically examined using the chi-square test and phi coefficient.

Figure 3 provides an overview of the investment group's share in the total investment, distinguishing between groups with and without stimulus. First, the influence of the stimulus on sin investments was examined. The result shows that 12% of the subjects in the CG decided without stimulus for a sin investment. After stimulation, this proportion increased marginally to approximately 15%. In relative terms, the proportion of sin investments increased by 23.1% due to the deliberate manipulation of a socially coined TA. However, in absolute terms, its share increased by only 2.8 percentage points. The chi-square test does not attest to statistical significance ( $p = 0.681$ ); thus, a relationship between the two variables cannot be established. Regarding sin investments, a cell has an expected frequency of less than 5. Thus, Fisher's exact test is used for statistical analysis. This test also refutes the relationship between the two variables ( $p = 0.789$ ). Therefore, no phi coefficient was calculated for this variable pairing.



**Figure 3.** Influence of the stimulus on the selected investments

The investigation of the influence of the stimulus on the neutral investment group shows that more than half of the subjects in the CG opt for a neutral investment without stimulus. However, after the stimulus has been applied only about a quarter of the subjects selected such an investment.

Due to the deliberate manipulation of a socially marked TA, the subjects chose a neutral investment 53.5% less often. The chi-square test indicates a statistical significance level of 99% ( $p = 0.001$ ). The calculated phi coefficient generated a value of  $-0.251$ , indicating a moderate, negative relationship between the variables.

Finally, the influence of the stimulus on impact investments is examined. Figure 3 shows that one-third of the subjects in the CG selected impact investments without stimulus, whereas in the EG approximately 60% selected impact investments. This result shows that investors who had been exposed to a social TA in the experiment were more likely to choose an impact investment than the CG investors. The chi-square test indicates that the observable

difference is statistically significant at the level of 99% ( $p = 0.006$ ). The calculated phi coefficient generated a value of 0.211, indicating a moderate, positive relationship between the variables.

The statistical analyses indicate a correlation between a social TA and investors' decision-making, thus supporting H0. A comparison between the CG's and EC's investment decisions at the aggregated level revealed a statistically significant correlation with moderate strength between the variables examined. A detailed examination of the individual investment groups (apart from the sin investments) confirmed this relationship. The deliberate manipulation of a socially oriented TA leads to a sharp increase in impact investments relative to the total investment, whereas the share of neutral investments decreased substantially. Although the share of sin investments increased slightly, it is not statistically significant.

**Table 4.** Summary of the statistical analysis

n = 167	share without stimulus	share with stimulus	Delta absolutely	Delta relative	Chi-square	Phi	Cramer's V
Sin Investments	12,2%	14,9%	2,8%	23,1%	0,169	n/a	n/a
Neutral Investments	54,5%	25,4%	-29,1%	-53,5%	10,509	-0,251	n/a
Impact Investments	33,3%	59,7%	26,4%	79,1%	7,424	0,211	n/a

The conducted experiment showed that a social TA significantly influences investors' decision-making behaviour. Further results of the experiment are presented for a comprehensive understanding of this relationship and to exclude distorting effects. Furthermore, the influence of individual stimuli on decision-making behaviour is examined closely as well as the possession of financial products.

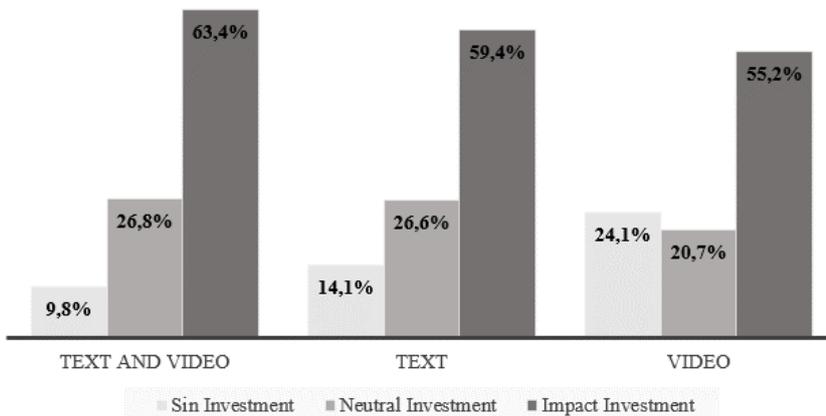
#### Influence of different stimuli

The strength of the influence of the different stimuli is the subject of the analysis of H1: 'The stimuli used to manipulate consciously the socially shaped TA influence investors' decision-making behaviour to varying degrees.

Figure 4 shows the contribution of the three investment groups to the total investment depending on the stimulus set. The distribution structure of the investments made between the individual stimuli is similar. Due to the social aspect of TA, the majority of respondents opt for impact investments, whereas sin and neutral investments account for between 10% and 27%. The characteristics of the investment groups between the individual stimuli show slight differences. For the combined stimulus groups, the proportion of respondents who selected impact investments is around 4% and 8%, compared with groups with either text or video stimuli. The proportion of sin investments is reduced by approximately 4% and 14% in the direct comparison. The proportions of the subjects who selected a neutral investment are approximately equal in the groups with combined stimulus and text stimulus, that is 27%, whereas the proportion in the groups with video stimulus is approximately 21%.

Statistical significance was checked using the chi-square test. The relationship between the nature of the stimulus and investment decisions is not significant ( $p = 0.569$ ). Consequently, Cramér's V was not calculated. Thus, the

observable differences in subjects' investment decisions cannot be explained by the different stimuli but are caused by the natural variability of the sample. Thus, H1 is supported.

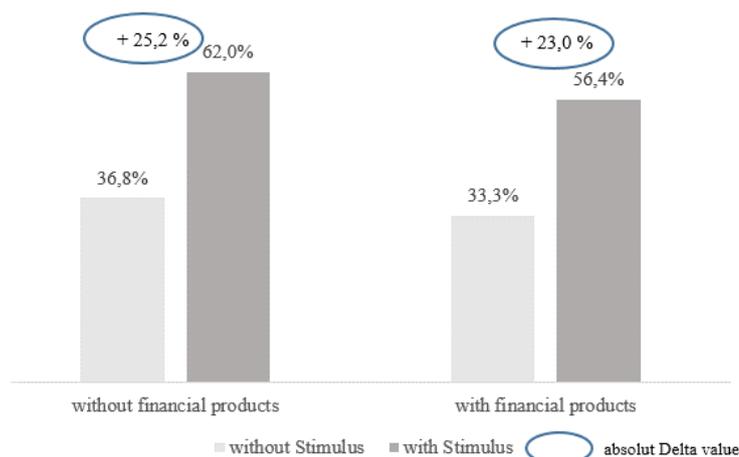


**Figure 4.** Share of the respective investment group depending on the stimulus used

#### Influence of financial product ownership

The question of financial product ownership, including stocks, bonds, and funds, aims to determine whether investor experience with financial impacts a social TA. The decision-making behaviour towards impact and non-stimulus impact investments is contrasted, and a distinction is made between subjects with or without financial products. This study aims to provide the first indication of the consequences of owning financial products on the influence of TA on investor decision-making.

Seventy-one subjects ( $n = 167$ ; 42.5%) own financial products. The proportion of the subjects with financial products did not significantly differ between the CG and EG figures at the aggregated level. Figure 5 illustrates the share of impact investments in the total investment, distinguishing between financial product ownership and the stimulus provided. Subjects with and without financial products are equally affected using a stimulus. The proportion of impact investments increased from approximately 1/3 to 62% or 56% of all investments. The chi-square test showed a significant correlation between the subjects without financial products with a significance level of 95% ( $p = 0.046$ ), whereas no significant correlation ( $p = 0.148$ ) was found in subjects with financial products. Thus, H2 is confirmed.



**Figure 5.** Share of impact investments in the total investment subdivided by financial product ownership and stimulus

### Critical Appraisal of the Results

The primary objective of this study is to examine the observable irrationality of II investors from the traditional financial theory perspective relative to the concept of TA. The influence of TA on investors' decision-making behaviour was analysed through an experiment involving 167 undergraduate students from the University of Applied Sciences Upper Austria, Steyr Campus, in May 2018.

The changes in participants' investment decisions observed in the experiment using a stimulus were irrational from the traditional financial theory perspective. Following the principles of Markowitz's (Markowitz, 1991) classical portfolio optimisation, one of the most widely used analysis models, the investment with the best risk/reward ratio in the form of the Sharpe ratio should be selected (Sharpe, 1994). Based on the experiment, investment 2 (a sin investment) has the highest Sharpe Ratio, followed by investments 3 and finally investment 1. The two impact investments (investments 5 and 6) have the lowest Sharpe ratio. However, investment 2, with the highest Sharpe ratio, is not the preferred investment of the subjects, both in the CG and EG, and a majority of them selected impact investments. These results suggest that traditional financial theory cannot fully evaluate investments as the subjects consider not only financial factors but also other aspects of their decisions.

The deliberate manipulation of a socially influenced TA significantly impacts investors' decision-making behaviour as evidenced in the experiment. The subjects increasingly selected impact investments using the stimuli. The share of neutral investments is significantly reduced, whereas the variation in sin investments is not significant. These results are consistent with the findings in the literature review. Thus far, research has paid little attention to the concept of TA. Nevertheless, certain authors, particularly Williamson (Williamson, 1993), emphasise the relevance of TA and its impact on decision-making. This finding is confirmed by the experimental results.

Moreover, the experimental results show that investors are prepared to forgo a part of the financial return to achieve a social impact. From a purely monetary point of view, impact investments are not the preferred choice for investors. The deliberate design of a social TA encourages financiers to participate in II. Particularly, investors who would prefer a neutral investment without stimulus respond to the given stimuli because the share of neutral

investments after the stimulus has decreased by approximately 30 percentage points, whereas the proportion of sin investments slightly increased. Sin investment accounts for between 12% and 15% in the CG and EC, suggesting that the weighting of the monetary and moral components varies between individuals. As a result, certain individuals become highly influential, whereas the predominant TA has minimal effects on others. This fading correspondence with Levitt and List's (Levitt & List, 2007) findings that individuals' different moral standards lead to varying investment decisions. The assumption that particular investors consider less significance for the moral aspect explains the observation that the share of sin investments stagnates in the EG compared with that in the CG.

The asset component can be used to explain the significantly higher proportion of neutral investments in the CG (55%) than in the other two investment groups. Although this proportion is decreasing in the EG, 25% of the subjects decided on such an investment given a stimulus. One possible explanation is the higher average Sharpe ratio of neutral investments compared with impact investments. These subjects attach greater weight to the financial return of neutral investments than to the moral benefits of impact investments. The moral costs associated with sin investments indicate that the total benefit of investing in neutral investments is greater than in sin investments, which have higher financial returns. We conclude that although the group of neutral investments is sensitive to the stimuli used, the financial aspect plays a major role. In the experiment, impact investments deliberately assumed lower financial profitability; in practice, these investments often provide market-level returns. Through the social aspect of TA along with usual market returns, an incentive for neutral investments can be set.

Previous research shows that investors' decision-making behaviour is influenced by social and financial aspects (Barreda-Tarrazona, Matallín-Sáez, & Balaguer-Franch, 2011; Levitt & List, 2007; Nilsson, 2008; Sanfey, 2007). This finding was confirmed by the experiment.

Furthermore, from the experiment conducted, it can be deduced that the conscious manipulation of a socially oriented TA evidently leads to a change in the weighting of the monetary and moral components. The calculated strength of the connection between the stimuli made and the investors' decisions in the form of Cramér's  $V$  is 0.254, indicating a moderate dependency. The stated assumption that moral aspects have relevance in the execution of investment decisions and that further factors must also be taken considered is thereby confirmed.

To manipulate TA, three different stimuli were used: text, video and combined stimuli. The hypothesis that the various stimuli influence investors' decision-making behaviour in varying degrees could not be confirmed. The share of impact investments in the total investment is expected to be highest at approximately 64% when using a combined stimulus. However, this condition is not significantly different from the proportion of impact investments using a text (59%) or video stimulus (55%).

People have different information processing techniques. Thus, the influential power of the different stimuli demonstrates heterogeneity when comparing the combined stimulus with the other two stimuli. Information is a stimulus perceived by humans through the various sensory organs. Thus, humans differ in the preference of the respective sensory channel, whereby, certain people perceive information better visually, whereas others better aurally (Creß, 2006; Looß, 2007). The literature discusses different learning (Vester, 1975; Wild, 1998) and cognitive styles (Bandura, 1976).

The stimuli used in the experimental setup are auditory and visual. As the experiment was conducted exclusively with students, we assume that the learning or cognitive styles in the sample are approximately equally distributed. The absence of significant differences between a text and video stimulus is reasonable. However, this result does not explain why the use of a combined stimulus does not have a greater influence on the choice of impact investments, particularly if more sensory organs are considered. Therefore, learning and cognitive styles would have to be addressed. This observation suggests that the different cognitive styles and, consequently, the manifestation of the stimulus to manipulate a socially oriented TA are less significant. Rather, a given stimulus will lead to a change in investors' decision-making behaviour.

The hypothesis that financial product ownership changes the influence of a socially oriented TA on investors' decision-making behaviour was confirmed. The use of stimuli increases the share of impact investments in the financial and non-financial product groups, with a 25% and 23% increase, respectively. The chi-square test revealed a significant correlation between the stimuli and investment decisions only for the non-financial group due to the size of the two samples. Therefore, subjects who own financial products are statistically less susceptible to stimuli than those otherwise.

Following the findings in the literature, experience with investment decisions contributes to understanding the underlying risk/return ratio. Experienced investors make informed investment decisions because potential gains and losses can be estimated easily (Bateman et al., 2014; Bradbury, Hens, & Zeisberger, 2014; Kaufmann, Weber, & Haisley, 2013; Mishra & Metilda, 2015). However, this phenomenon does not explain the minimal responsiveness to the stimuli used by subjects with financial products. Studies investigating investors' experience of stimulus readiness show that experienced investors are less prone to cognitive biases (Frydman, Barberis, Camerer, Bossaerts, & Rangel, 2014; Goetzmann & Kumar, 2008; Korniotis & Kumar, 2011). Increasing investor experience reduces the impact of these distortions. Thus, investors will be less affected by the stimuli used to manipulate a socially coined TA. This situation justifies less experienced investors' preference to impact investment. In this experiment, investor experience has been equated to financial product ownership for simplification.

## **Implications for Science and Practice**

The results presented show that TA influences investment decisions. In the literature, the topic has received less attention. The paper shows that the views of traditional finance theory are outdated and do not reflect reality. Individuals' consideration of non-financial factors in their decisions is addressed in other disciplines, such as behavioural economics (De Bondt, Muradoglu, Shefrin, & Staikouras, 2008; Mullainathan & Thaler, 2000), narrative economics (Bikhchandani & Sharma, 2000; Cork, Jaeger, Jette, & Ebrahimoff, 2017; Shiller, 2017), legitimacy (O. M. Lehner & Nicholls, 2014; Suchman, 1995) and sociology (Schäfers, 2016; Weber, 2002). The disciplines explain individual factors that influence the context of a transaction but do not provide a holistic view of the TA phenomenon. Various studies (Barreda-Tarrazona et al., 2011; Døskeland & Pedersen, 2015; Glac, 2009) analyse the influence of the individual aspects of TA on investment decisions, though the authors have not found any comprehensive studies dealing with the topic.

The results show that the type of stimulus used is not significant. A socially coined TA leads subjects to invest in impact investments increasingly. Investors' respective personal characteristics influenced their investment decisions.

The II area pursues a financial return and social impact. Particular investors are willing to receive returns below market levels, whereas others seek market level returns. This observation is also reflected in the evaluation of the experimental results. Certain subjects were willing to invest in less profitable impact investments, whereas others did not accept this trade-off. The core message of this paper is that a social TA increases the moral value of investors in II. As a result, numerous investors can be gained for sustainable and responsible investments because the total benefit of investment consists of a combination of wealth and moral components as Levitt and List's (Levitt & List, 2007) model illustrates.

For practitioners, it can be deduced from the experimental results that investors' decision-making behaviour is influenced by the prevailing context of a transaction. TA is composed of various factors; it is a complex construct that cannot be clearly defined and therefore cannot be manipulated in its entirety. As the experimental results show, leveraging the appropriate levers can help direct investors' decisions towards a certain goal. II-organisations seeking potential investors can derive important insights into investor decision-making through a comprehensive understanding of the context. Numerous investors can be gained by creating a TA that emphasises the positive qualities of impact investments. Which factors used to stimulate this atmosphere is of minor importance.

Measures to increase investors' financial knowledge can lead to a significant increase in sensitivity to impact investments. Understanding the financial context and the impact of investments made may be an incentive to attract additional investors in II. Organisations can increase interest in sustainable and responsible investments by disseminating information on underlying financial themes and characteristics of impact investments.

## **Limitations and Future Research**

One of the limiting factors of this study is that the experimental subjects included undergraduate students only. Their investment decision-making experience is limited and is receptive to sustainable and responsible investment due to generational differences (Michelsen, Grunenberg, Mader, & Barth, 2016). Therefore, the results presented in the paper are not generalisable. In laboratory experiments, the external validity is low, which is difficult to avoid. Possible relationships can be investigated under controlled conditions and without interference. Therefore, validity concerns are limited to financial knowledge, investment decision-making and the fundamental attitude towards impact investments. To validate the results, the experiment should be repeated with institutional investors to determine the extent of expected differences.

Future research could review the influence of TA based on field data and repeat the experiment in different countries to derive from results possible cultural differences related to investment decisions and TA.

Another limiting factor is the concept of TA. TA has many non-financial factors, the combination of which shapes the prevailing context of a transaction. Due to the complexity of TA and the assumption that it has different characteristics for each investor, deliberate manipulation and control are impossible for all influencing factors. For example, narratives can be cited and thus influence individual investors in various ways. Precisely controlling these and similar influences in a laboratory experiment is almost impossible. It can be assumed that investment decisions

are also driven by unexplainable factors to a certain extent. In the future, a more detailed analysis of the individual components of the TA could be performed, where the effect of interactions between investors on their decision-making can be examined.

## **Summary**

Our study aims to explain investors' irrational behaviour in the SF/II area from the traditional financial theory perspective. We investigated how TA affects investors' decision-making through an experiment with undergraduate students in spring 2018. This topic had received little attention in the literature,

The results show that a socially coined TA influences investors' decision-making. The number of impact investments increased significantly because of the stimuli made. Furthermore, neutral investors are receptive to the stimuli used. The proportion of sin investments remained constant due to the continued high relevance of the financial earning power of the investments. Not all investors are willing to give up part of the financial return. Compared with the moral component, the weighting of the asset component differs on an individual level and depends on the respective moral standards of the investors.

TA is also influenced by the personal characteristics of the investor, such as existing financial knowledge and investment decision-making experience. Experience with investment decisions weakens cognitive biases, thereby reducing TA's impact.

The findings in this study contribute to a comprehensive understanding of individuals' decision-making. Financial return continues to be a crucial factor for investment decisions, though the decision-making process is also influenced by non-financial factors, such as TA. This aspect is often not considered in the established financial models. Although not all factors of TA can be accurately controlled, the prevailing TA can be manipulated, thereby triggering decision-making in a particular direction. As a result, in practice, several investors can be approached and acquired for the SF/II area.

Further research is needed to develop the knowledge gained and obtain a comprehensive picture of the influence of non-financial factors on investment decision-making. This work confirms the relationship between TA and investors' decisions. Future research should include the individual components of TA. An analysis of socio-demographic and cultural factors is necessary to explain completely the mechanisms behind TA. Research in this area is difficult to formalise compared with other disciplines due to its intangible nature.

The demand for further research is compounded by the current condition of present financial models, that is they are still based on traditional financial theory, albeit obsolete, which focuses on the rationality of the actors. In recent decades, increasing flows have identified and investigated the influence of non-financial aspects. A holistic perspective in the context of investment decisions has received little attention, probably due to complexity. The concept of TA is an eligible starting point to shed light on the influence of non-financial factors on investment decision-making and, consequently, to enhance the understanding of individual decision-making processes and holistic economic relationships.

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