



IUSS
Scuola Universitaria Superiore Pavia



LEVERAGING ON INVESTORS' GREEN PREFERENCES TO DELIVER SUSTAINABLE FINANCE

A Thesis Submitted in Partial Fulfilment of the Requirements
for the Degree of Doctor of Philosophy in

Sustainable Development and Climate change

Doctoral Programme of National Interest



PhD SDC
SUSTAINABLE DEVELOPMENT
AND CLIMATE CHANGE

In the Curriculum
THEORIES, INSTITUTIONS AND CULTURES

Luisa Nenci

June, 2025

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Supervisor: Prof. Eugenia Macchiavello

ABSTRACT

The Action Plan on Financing Sustainable Growth and the European Green Deal gave to the financial system an important role to play in the achievement of the Paris agreement and the UN 2030 Agenda, by reorienting private capital to more sustainable investments for decarbonisation also from retail investors. This led to an increased regulation-induced disclosure and the revision of the investment firms' conduct and organisational requirements, including the MiFID II suitability assessment, to integrate investors' sustainability preferences into investment decisions. The most relevant initiatives shaping the sustainability preferences legal framework are analysed in chapter I.

Investors' sustainability preferences fulfilment mainly consists in the subscription of an adequate financial instrument within a range of suitable products identified by financial advisors and portfolio managers accordingly to the client financial and sustainability profile, normally using a questionnaire. However, even when investors are well advised and convinced of the benefits of a specific investment, their actual investment behaviour can present a different outcome because pro-environment behaviours appear disengaged from financial decisions.

Therefore, to better understand investor behaviour toward green investments, a questionnaire has been designed using choice architecture techniques to bridge the gap between environmental consciousness and investment decisions. As described in Chapter II, the questionnaire's conceptual framework incorporates elements such as framing, information load, loss aversion, inter-temporal choices, status quo bias, and default analysis for application. These factors are applied to investors' investment choices in Taxonomy-aligned, economically sustainable activities to integrate behavioural economic bias mitigation strategies, while assessing, evaluating, and prioritizing investors' sustainability preferences and their climate risk perception.

Chapter III examines the questionnaire trial through investor's investment choices collected from a sample of UK young investors (n = 178). Specifically,

the analysis objectives are to (1) assess, evaluate and prioritise investors sustainability preferences for different types of carbon neutral companies, (2) estimate the identified behavioural factors associated with investors climate beliefs, (3) explore heterogeneity across respondents' preferences and beliefs, (4) convalidate questionnaire's structure.

A final chapter explores the potential integration of the tested questionnaire into the MiFID II suitability assessment. In fact, as a choice architecture tool, the questionnaire helps counteract investors' behavioural biases against green investments effectively capturing their sustainability preferences. Aligning financial products with clearly defined investor values and sustainability interests enhances both compliance with European regulations and investor protection transforming the suitability assessment from a product-oriented tool into a client-focused protection model.

Furthermore, this analysis, by uncovering sustainability preferences, enables sophisticated investors to achieve decarbonization in line with their own green objectives. As well as it supports neutral-adverse and naïve investors choices to be effectively guided by policymakers and regulators through carefully designed, customised investment options consistently shaped against their sustainability preferences. These tailored choices, adapted to investors' behaviours and financial profiles, help nudge neutral or undecided investors toward personalized, and therefore more suitable green investment solutions, by ultimately aligning their sustainability preferences with broader decarbonization goals. Then, a green default, adequately aligned to investors preferences by choice architecture, can promote better decision-making encouraging greater public participation in climate action through green investment choices.

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TABLE OF CONTENTS

1	SUSTAINABILITY PREFERENCES LEGAL FRAMEWORK	1
1.1	INTRODUCTION	1
1.2	THE FOUNDATIONS OF THE EU SUSTAINABLE FINANCE FRAMEWORK	5
1.3	SUSTAINABLE FINANCE IN THE EU CARBON NEUTRALITY PARADIGM	7
1.3.1	THE TRANSFORMATIVE IMPACT OF THE EU GREEN DEAL	8
1.3.2	CLIMATE NEUTRALITY ADOPTION	10
1.3.3	FIRST EU ALIGNMENT TO CLIMATE TARGETS	12
1.3.4	THE EU TRANSITION TO A SUSTAINABLE ECONOMY	13
1.3.5	A FURTHER STEP TOWARDS COMPLETING THE SUSTAINABLE FINANCE FRAMEWORK.	16
1.4	THE DISCLOSURE FRAMEWORK TO PROVIDE INVESTORS WITH INFORMATION FOR SUSTAINABLE INVESTMENT CHOICES.	17
1.5	THE CLASSIFICATION SYSTEM FOR GREEN ECONOMIC ACTIVITIES TO AVOID GREENWASHING INVESTMENTS.	24
1.5.1	EU - UK SUSTAINABLE INVESTING REGIME COMPARISON	27
1.6	SUSTAINABILITY PREFERENCES AND ITS LEGAL FRAMEWORK	31
1.6.1	THE SUITABILITY ASSESSMENT	32
1.6.2	DEFINITIONS	34
1.6.3	SUSTAINABILITY PREFERENCES ASSESSMENT	36
1.6.4	SUSTAINABILITY PREFERENCES EVALUATION	37
1.6.5	INVESTMENT FIRMS' ASSESSMENT COMPLIANCE	38
1.7	PRELIMINARY CONCLUSIONS	40
1.7.1	IS THE CURRENT LEGAL FRAMEWORK CONCERNING DISCLOSURE AND SUITABILITY ASSESSMENT, SUPPORTING SUSTAINABILITY PREFERENCES ASSESSMENT IMPLEMENTATION, ADEQUATE TO CONTRIBUTE TO THE GREEN DEAL CARBON NEUTRALITY OBJECTIVE?	47
	REFERENCES LIST	49

2 INVESTORS' GREEN DECISION MAKING	66
2.1 INTRODUCTION	66
2.2 BEHAVIOURAL ECONOMICS AND FINANCE	67
2.3 BEHAVIOURAL ECONOMIC INSIGHTS RELEVANT FOR FINANCIAL SERVICES	69
2.3.1 INFORMATION SYSTEM QUALITY AND INFORMATION OVERLOAD	69
2.3.2 FRAMING EFFECT AND HEURISTIC BIAS	74
2.3.3 LOSS AVERSION, STATUS QUO, AND RISK PERCEPTION	75
2.3.4 PRESENT BIAS, MYOPIA, INTERTEMPORAL DISCOUNTING.	78
2.3.5 DEFAULT OPTION	79
2.4 PSYCHOLOGICAL PROCESSES TO MAKE GREEN DECISIONS IMPLEMENTED.	81
2.4.1 INFORMATION LOAD, QUALITY AND COMPLEXITY BIAS MITIGATION	83
2.4.2 FRAMING EFFECT AND HEURISTIC BIAS MITIGATION	84
2.4.3 LOSS AVERSION, STATUS QUO AND RISK PERCEPTION.	86
2.4.4 PRESENT BIAS AND INTERTEMPORAL CHOICES.	87
2.4.5 DEFAULT APPLICATION	88
2.5 AN INSTRUMENT TO EVALUATE SUSTAINABILITY PREFERENCES AND GREEN BEHAVIOURS.	89
2.5.1 SUSTAINABILITY PREFERENCES WILL BE AFFECTED BY THE KIND OF SECTOR THE COMPANY IS INVESTING IN?	91
2.5.2 IS THE PERCEPTION OF LOSSES AND GAINS AND VALUE OF TIME DUE TO CLIMATE CHANGE ACTIONS INFLUENCING INVESTORS CHOICES?	92
2.6 METHODS	93
2.6.1 PARTICIPANTS AND RECRUITMENT	93
2.6.2 TASK DESIGN	95
2.7 CONCLUSIONS	103
REFERENCE LIST	109
APPENDIX I QUESTIONNAIRE	121
APPENDIX II ETHICS REFERENCE	127
3 SUSTAINABILITY PREFERENCES ASSESSMENT OF A SAMPLE OF YOUNG ADULTS	131
3.1 INTRODUCTION	131
3.2 UNDERSTANDING SUSTAINABILITY PREFERENCES AND CLIMATE CHANGE PERCEPTION	132
3.2.1 UNDERSTANDING TYPES OF SUSTAINABILITY PREFERENCES	132
3.2.2 UNDERSTANDING PERCEPTIONS OF CLIMATE CHANGE	133

3.2.3	VARIABLES HYPOTHESIZED TO DESCRIBE PREFERENCES AND RISK PERCEPTION.	134
3.3	METHODS: DATA COLLECTION AND ANALYSIS	136
3.3.1	SURVEY DATA AND MEASUREMENT	136
3.3.2	STATISTICAL ANALYSIS	136
3.4	RESULTS	138
3.4.1	PILOT TEST	138
3.4.2	FINAL QUESTIONNAIRE	146
3.5	CHAPTER CONCLUSIONS	166
	REFERENCE LIST	168
4	POLICY AND REGULATION IMPLICATIONS DISCUSSION	175
4.1	GREEN DEFAULT	177
4.2	QUESTIONNAIRE INTEGRATION TO MIFID II SUITABILITY ASSESSMENT	180
4.3	THE QUESTIONNAIRE AS EMPIRICAL SOLUTION	182

LIST OF FIGURES

<i>Figure 1: Behavioural economic insights relevant for financial services</i>	107
<i>Figure 2: Loss Aversion Factor (LAF) z-scores</i>	143
<i>Figure 3: Combined loss aversion and discount factors by profile</i>	144
<i>Figure 4: Vote by preference versus vote with capital</i>	149
<i>Figure 5: GINI index per dominion</i>	153
<i>Figure 6: Loss aversion factors compared to loss aversion cumulative respondents' data</i>	155
<i>Figure 7: Mean expected value of investments</i>	156
<i>Figure 8: IRR-dr data</i>	158
<i>Figure 9: LAF z-scores and GINI Index bio-methods dominion</i>	163
<i>Figure 10: LAF z-scores and GINI Index chemical dominion</i>	164
<i>Figure 11: LAF z-scores and GINI Index ghg dominion</i>	164
<i>Figure 12: Loss Aversion Factors (LAF)-discount rate (dr) correlations</i>	166

LIST OF TABLES

<i>Table 1: Domain selection for final questionnaire framework.....</i>	85
<i>Table 2: Literature review of questionnaire on Climate Change knowledge and personal impact.....</i>	100
<i>Table 3: Demographic characteristics of survey sample (n=178).....</i>	136
<i>Table 4: Most preferred environmental objectives.....</i>	139
<i>Table 5: Preferences for single action.....</i>	140
<i>Table 6: Order of most preferred environmental domains of action.....</i>	141
<i>Table 7: Calculated Cronbach alpha.....</i>	142
<i>Table 8: Sustainability preferences assessment and evaluation.....</i>	147
<i>Table 9: Correlation among objectives.....</i>	151
<i>Table 10: Correlation among objectives and sustainability actions bio-methods dominion.....</i>	151
<i>Table 11: Correlation among objectives and sustainability actions chemicals and technology processes dominion.....</i>	151
<i>Table 12: Correlation among objectives and sustainability actions CO2 emissions reduction dominion.....</i>	152
<i>Table 13: Replies to loss aversion questions' answers of 175 respondents.....</i>	154
<i>Table 14: Environmental objectives correlation with LAF and dr.....</i>	160
<i>Table 15: Environmental objectives, LAF and dr correlation bio-methods domain.....</i>	161
<i>Table 16: Environmental objectives, LAF and dr correlation chemical and technologies domain.....</i>	161
<i>Table 17: Environmental objectives, LAF and dr correlation CO2 abatement domain.....</i>	162
<i>Table 18: Spearman coefficients LAF and dominions.....</i>	163
<i>Table 19: Best environmental actions.....</i>	183
<i>Table 20: LAF descriptions.....</i>	184

LIST OF ABBREVIATIONS

CMU Capital Market Union

dr discount rate

EESC European Economic Social Committee

EGD European Green Deal

EU European Union

ESA European Supervisory Authorities

ESMA European Securities Markets Authority

GHG Green House Gas emissions

HLEG High-Level Expert Group

IRR Internal Rate of Return

LAF Loss Aversion Factor

MiFID II Markets in Financial Instruments Directive

NPV Net Present Value

OCP Oxford University Publisher

RIP Retail Investment Package

SFDR Sustainable Finance Disclosure Regulation

UCP university of Cambridge Publisher

UK United Kingdom

UN United Nations

UNCCCC United Nations Framework Convention on Climate Change

CHAPTER 1



***Sustainability
framework***

preferences

legal

1 SUSTAINABILITY PREFERENCES LEGAL FRAMEWORK

1.1 INTRODUCTION

The importance of integrating investors' sustainability preferences into investment decisions has led to an increased regulation-induced disclosure and the revision of the suitability assessment requirements of the Markets in Financial Instruments Directive (MiFID II)¹.

The process started in late 2016, when the European Commission entrusted the High-Level Expert Group (HLEG)² on sustainable finance with the mandate to advise on the elaboration of a comprehensive EU strategy concerning sustainable finance and development. In HLEG's final report, released in January 2018, the HLEG put forth eight recommendations, encompassing overarching suggestions as well as actions tailored to the financial sector.

The following Action Plan for Financing Sustainable Growth³, which collected HLEG recommendations for implementation, was also meant to contribute to the Capital Markets Union's⁴ efforts on financial operations synchronisation to achieve both environmental and societal development. In fact, the strategy

¹ Council Directive (EU) 2014/65 of 15 May 2014 on markets in financial instruments and amending (Directive) 2002/92/EC and (Directive) 2011/61/(EU) (recast), 'MiFID II' [2014] OJ L 173/349, article 25(2); and Commission Delegated Regulation (EU) 565/2017 of 25 April 2016 supplementing Directive 2014/65 regards organisational requirements and operating conditions for investment firms and defined terms for the purposes of that Directive. 'CDR 565/2017' [2017] OJ L87/1, articles 54 and 55; and Commission Delegated Regulation (EU) 1253/2021 of 21 April 2021 amending Delegated Regulation 565/2017 as regards the integration of sustainability factors, risks and preferences into certain organisational requirements and operating conditions for investment firms [2021] OJ L277/1, article 1(6).

² High-Level Expert Group (HLEG) on Sustainable Finance, *Final Report 2018: Financing a sustainable European economy* (European Commission, 2018).

³ Commission, 'Action Plan Financing Sustainable Growth', (Communication) COM (2018) 097.

⁴ The Capital Markets Union (CMU) initiative, initiated in 2015, aimed to foster the development and enhancement of capital markets integration across the EU. The actions delineated in the 2015 and 2017 CMU action plans have been executed. In September 2020, fresh measures were proposed to modernize the CMU, targeting vital sectors including EU business funding, market infrastructure, retail investment, and the internal market. Commission, 'A Capital Markets Union for people and businesses-new action plan' (Communication) COM (2020) 590 final. Following from Action 8 of the September 2020 New Capital Markets Union Action Plan, which is about building retail investors' trust in capital markets, the Commission adopted the omnibus directive proposal of 24 of May 2023 'Retail Investment Strategy'. For more details see text and related footnotes 22 and 23 of this paragraph.

delineated in the Action Plan represented a foundational step in advancing finance towards sustainability⁵. The financial system assumed a significant responsibility in advancing climate protection initiatives and objectives of the Paris Agreement and the UN 2030 Agenda by redirecting private investments towards more sustainable ventures mainly through improved transparency⁶ but also through sustainability preferences consideration⁷. However, to fully unleash its potential, the Action Plan required supplement actions across diverse domains, for which a significant bound forward, was achieved with the Green Deal adoption⁸.

The European Green Deal (EGD)⁹, an articulated set of policy initiatives introduced in 2019, charted Europe's course towards a greener future. The primary objective of the EGD is to attain climate neutrality by 2050, with an interim target of reducing emissions by 55% by 2030. To achieve these objectives, sustainable finance assumed a pivotal role for Europe to become the world's first climate-neutral continent by 2050. The ambition of the EGD, to evolve the EU into a “modern, resource-efficient, and competitive economy”¹⁰, created a paradigm shift that transcended from environmental concerns to redefine the entire landscape of EU governance, encompassing financial market operations among other sectors¹¹. In the following two years, the Commission introduced several cases for carbon neutrality with a number of action plans, strategies, directives/regulations, and policies as instruments

⁵ Papers consulted for this part included: Danny Busch, Guido Ferrarini, and Seraina Grünewald, 'Sustainable Finance in Europe: Setting the Scene' in Danny Busch, Guido Ferrarini, and Seraina Grünewald (eds.), *Sustainable Finance in Europe*, EBI Studies in Banking and Capital Markets Law, (Springer Nature Switzerland, 2021) 512; Michele Siri and Shanshan Shu, 'Will the EU Commission Successfully Integrate Sustainability Risk and Factors in the Investor Protection Regime? A research Agenda' (2019) *Sustainability* 11, 6292, Sustainable finance and financial education – a snapshot, Eugenia Macchiavello and Michele Siri (eds) *Sustainable Finance and Financial Education: A snapshot* (eBook, Giappichelli, 2024, The Cambridge Handbook of Sustainable Finance, Kern Alexander, Matteo Gargantini and Michele Siri (eds), *The Cambridge Handbook of EU Sustainable Finance. Regulation, Supervision and Governance* (Cambridge University Press, forthcoming 2025), and University of Genoa EUSFiL Law Research Working Paper Series.

< <https://www.ssrn.com/index.cfm/en/u-genoa-res/>> accessed 13 February 2024.

⁶ Volker Brühl, 'Green Finance in Europe—Strategy, Regulation, and Instruments' (2021) 56 (6) *Intereconomics* 323 <<https://www.intereconomics.eu/contents/year/2021/number/6/article/green-finance-in-europe-strategy-regulation-and-instruments.html>> accessed 13 February 2024.

⁷ Euromoney Institutional Investor PLC, 'Sustainability preferences: The key to green investing' (*Global Capital*, 16/06/2022) <<https://www.proquest.com/trade-journals/sustainability-preferences-key-green-investing/docview/2690879032/se-2>> accessed 13 February 2024.

⁸ José Manuel Alves, 'European Sustainable Finance: introductory notes on the EU green deal and new green finance perspectives' (UCP 2023) 63.

⁹ Commission 'The European Green Deal' (Communication) COM (2019) 640 final.

¹⁰ European Commission 'The European Green Deal: Striving to be the first climate-neutral continent' (*European Commission*, 11 December 2019) <https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en> accessed 13 February 2024.

¹¹ Edoardo Chiti, 'Managing the Ecological Transition of the EU: The European Green Deal as a Regulatory Process' (2022) 59 (19) *Common Market Law Review*.

to operationalize the EGD across the economy¹². EGD influence extended beyond the financial realm, permeating crucial sectors and industries, impacting also on society and citizens through food system, living arrangements, and employment paradigms changes¹³.

Given this context, the Action Plan, to ensure that sustainability preferences were considered in investors' investment decisions, included into action number four, the revision of MiFID II suitability assessment, and requested the European Securities Markets Authority (ESMA) to integrate provisions regarding sustainability preferences into its guidelines for the suitability assessment¹⁴. Delegated Regulation (EU) 565/2017 is amended¹⁵ by adding in Article 2, the points (7), (8) and (9). This to categorise sustainability factors and risks¹⁶ as well as sustainable investments¹⁷ changes due to the adoption of Regulation EU 2019/2088 (SFDR)¹⁸. In line with the commitments for sustainable finance related to the Action Plan implementation, SFDR Article 2 point 7 also incorporated changes¹⁹ from the Green Taxonomy regulation²⁰. The Taxonomy, which is a further step in the EU regulation to increase transparency and consistency in the classification of green activities, wants to limit the risk of greenwashing in relevant markets²¹.

¹² Stefano Spinaci, 'Green and sustainable finance' (2021) Briefing Paper European Parliament Research Service n.679.081
<https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/679081/EPRS_BRI%282021%29679081_EN.pdf> accessed 13 February 2024.

¹³ Simon Schunz, 'The 'European Green Deal' – a paradigm shift? Transformations in the European Union's sustainability meta-discourse' (2022) 4(1) Political Research Exchange.

¹⁴ Action Plan Financing Sustainable Growth'; European Securities and Market Authority 'Guidelines on Certain Aspects of the MiFID II Suitability Requirements' (ESMA 2018) 35-43-1163; European Securities and Market Authority, 'Questions and Answers on MiFID II and MiFIR Investor Protection and Intermediaries Topics' (ESMA 2020) 35-43-349.

¹⁵ Commission Delegated Regulation (EU) 1253/2021, article 1 point (1).

¹⁶ Commission Delegated Regulation (EU) 1253/2021, article 1 adding point 8 (sustainability factors) to Commission Delegated Regulation 565/2017, article 2 as for Article 2 (24) of 'SFDR', and article 1 adding point 9 (sustainability risks) to Commission Delegated Regulation 565/2017, article 2 as for Article 2(22) 'SFDR'.

¹⁷ Commission Delegated Regulation (EU) 1253/2021, article 1 adding point 7(b) (sustainable investments) to Commission Delegated Regulation 565/2017, article 2 as for Article 3 (17) 'SFDR'.

¹⁸ Council Regulation (EU) 2088/2019 on sustainability-related disclosures in the financial services sector. 'SFDR' [2019] OJ L317/16.

¹⁹ Commission Delegated Regulation (EU) 1253/2021 article 1 adding point 7(a) (environmentally sustainable investments) to Commission Delegated Regulation 565/2017 article 2 as for article 2-point (1) Taxonomy.

²⁰ Council Regulation (EU)852/2020 (EU)of 18 June 2020 on the establishment of a framework to facilitate sustainable investment and amending Regulation 2088/2019. 'Taxonomy' [2020] OJ L198/13.

²¹ Veerle Colaert, 'Integrating Sustainable Finance into the MiFID II and IDD Investor Protection Framework' in Kern Alexander, Matteo Gargantini and Michele Siri (eds), *The Cambridge Handbook of EU Sustainable Finance. Regulation, Supervision and Governance* (Cambridge University Press, forthcoming 2025).

In May 2023, the Commission proposed the Retail Investment Strategy²², the proposal for an Omnibus directive, that also amends the Markets in Financial Instruments Directive (MIFID) to (i) empower retail investors to make better investment decisions; (ii) enhance trust and confidence in capital markets; (iii) increase retail investors' participation in the EU capital markets, while ensuring their protection. Among other measures, it is also included: adapting disclosure regulations; ensuring investment products provide genuine value for money to retail investors; addressing potential conflicts of interest arising from inducements; tackling misleading marketing practices; maintaining high qualification standards for professionals; and strengthening supervisory cooperation to ensure consistent application of rules across the EU.

More recently, the Commission also presented the 'Retail Investment Package' (RIP), which, although not directly focussing on the sustainable finance agenda, has the objective to foster a conducive environment to increased participation of retail investors in capital markets in Europe covering the entire investment journey of retail investors. For better legislation alignment, the proposal should have addressed sustainability when defining needed information, investment performances and product advice²³.

The following paragraphs analyse how the sustainability preferences legal framework was shaped by regulatory evolution. This to frame the assessment, evaluation and prioritisation of investors' sustainability preferences, measured by a questionnaire, the structure of which will be the topic of chapter II. The constructed questionnaire, which also includes factors of behavioural analysis,

²² Commission Proposal for a Directive of 24 May 2023 amending Directives (EU) 2009/65/EC, 2009/138/EC, 2011/61/EU, 2014/65/EU and (EU) 2016/97 as regards the Union retail investor protection rules COM (2023) 279 final. 'Retail Investment Package (RIP)'. This paragraph relies on the information from the following: European Commission, 'Retail investment – new package of measures to increase consumer participation in capital markets.' (*European Union*, 24 May 2023) <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13395-Retail-investment-new-package-of-measures-to-increase-consumer-participation-in-capital-markets_en> accessed 13 September 2024; The European think Tank Dedicated to Financial Services, 'Retail Investment Strategy' (*Eurofil*, February 2024) <<https://www.eurofi.net/current-topics/retail-investment-strategy/>> accessed 13 September 2024; Council of the European Union 'Retail investment package: Council agrees on its position' (*European Council*, 12 June 2024) <<https://www.consilium.europa.eu/en/press/press-releases/2024/06/12/retail-investment-package-council-agrees-on-its-position/>> accessed 13 September 2024; European Parliament, 'Retail Investor Strategy' (*Think Tank*, 22 April 2024) <[https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI\(2023\)749795](https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2023)749795)> accessed 13 September 2024.

²³ The RIP package encompasses a broad set of measures across four main areas: (i) product distribution and advice – addressing potential conflicts of interest from inducements, tackling misleading marketing, and upholding high professional qualification standards; (ii) product disclosures and information – ensuring that investment products offer real value for money to retail investors; (iii) investor education and access – standardizing transparency and information requirements across EU legislation to prevent overlaps; and (iv) supervisory cooperation – strengthening oversight to ensure consistent application of rules across the EU. The European Think Tank, 'Retail Investment Strategy.'

has been disseminated, and respondents' answer analysed. The possible implication of the analysis findings to the EU regulatory framework is described in paragraph 3.5 of chapter III.

1.2 THE FOUNDATIONS OF THE EU SUSTAINABLE FINANCE FRAMEWORK

The Action Plan on Financing Sustainable Growth, part of the Capital Markets Union (CMU), seeks to align financial activities with Europe's economic, social, and environmental needs. It promotes a strategy for sustainable finance by redirecting capital flows to support inclusive growth and advance the Paris Agreement and UN 2030 Agenda goals.

The European Action plan Financing Sustainable Growth, with its three main objectives of reorienting capital flows, mainstreaming risks, and fostering transparency for sustainability, has set the foundation of the European Sustainable Finance to ensure the required financing to climate protection initiatives at EU and World level. The action firstly introduced by the Action Plan through action one, is the instrument of the Taxonomy²⁴, which can ultimately affect investors' decisions for green investments selection by establishing a classification system, which defines environmentally sustainable economic activities. Also action two, with the creation of labels and standards schemes for green financial products, indirectly affected investors, who would like to express their investment preferences on sustainable activities. This by enabling easier access to, and use of information– through gradually integrating tools, such as comparison websites or financial planning services – and products. Such as, the use of the EU Ecolabel framework for certain financial products, to be applied after the Taxonomy adoption, to further improve the transparency for green characteristics of financial products to investors²⁵.

²⁴ 'Taxonomy' Regulation; for more information on the Taxonomy influence on the formation of sustainability preferences see the following paragraph 1.5 of this chapter.

²⁵ The Ecolabel for Retail Financial Product as the scheme identifying financial products independently verified as green against criteria of minimum environmental performance is an ongoing project managed by the EU Joint Research Centre based on the requirements of the EU Ecolabel Regulation 66/2010. This to award the best environmentally performing financial products. Eighteen ecolabels for financial services are listed in the ecolabel index < https://www.ecolabelindex.com/ecolabels/?st=category,financial_services > including B corp, CSRR Quality Standard ect.

The most significant action for the adoption of sustainability preferences included in the EU Action Plan, is number four²⁶. Which pursues, out of the total of ten actions, the first objective of reorienting capital flows towards sustainable investments, through the implementation of the essential step of incorporating sustainability when providing financial advice. This because the Commission become aware of the existing gap to consider the sustainability preferences of investors and beneficiaries when providing advice²⁷. Then the Action Plan explicitly recognized the important role of financial services providers play in retail investors' access to sustainable investments, although, this action will need a regulatory intervention to make the relationship between the investment product providers and the investor effective²⁸. For this action to be implemented, together with the conduct of business rules and the regulatory strategy based on intermediary's organizational requirements²⁹, the forecasted legal instrument of operationalisation is the MiFID II suitability assessment, in its amended form³⁰, which is mandating investment portfolio managers and advisors to make investment decisions for, and advise clients on, investments especially selected on clients' assessed sustainability preferences to adequately service their clients on sustainability preferences³¹. Although, by providing the client with an adequate financial instrument, means addressing sustainability through the adoption of a product-oriented model,

²⁶ 'Action Plan Financing Sustainable Growth', 7. Action 3: Encouraging investment in sustainable projects is broadly outlined in the action plan as initiatives aimed at enhancing the effectiveness and impact of instruments that support sustainable investment. Key among these is InvestEU, along with the Financing the Transition and Leave No One Behind (Just Transition) programs, as defined by the Green Deal.

²⁷ Danny Busch, Guido Ferrarini and Arthur van den Hurk, 'The European Commission's Sustainable Finance Action Plan' (2018) <<https://ssrn.com/abstract=3263690>> accessed 28 February 2023.

²⁸ Veerle Colaert, 'Integrating Sustainable Finance into the MiFID II and IDD Investor Protection Framework', in Kern Alexander, Matteo Gargantini and Michele Siri (eds), *The Cambridge Handbook of EU Sustainable Finance. Regulation, Supervision and Governance* (Cambridge University Press, forthcoming 2025) for further discussion see paragraph sustainability preferences legal framework 1.6..

²⁹ For more information about Council Regulation (EU) 565/2017 (on the organisational requirements and rules of conduct of investment firms) please refer to: Matteo Gargantini, 'The New Role of Sustainability Preferences in the Regulation of Investment Services in Eugenia Macchiavello and Michele Siri (eds) *Sustainable Finance and Financial Education: A snapshot* (eBook, Giappichelli, 2024) paragraph 3; and Maddalena Rabitti, 'Prodotti finanziari tra regole di condotta e di organizzazione. I limiti di MiFID II' (2020) I, *Rivista di Diritto bancario*, 145 <<https://rivista.dirittobancario.it/prodotti-finanziari-tra-regole-di-condotta-e-di-organizzazione-i-limiti-di-mifid-ii>> accessed 4 September 2024.

³⁰ 'CDR 565/2017'.

³¹ Felix E. Mezzanotte, 'Accountability in EU Sustainable Finance: Linking the Client's Sustainability Preferences and the MiFID II Suitability Obligation' (2021) 16(4) *Capital Markets Law Journal*, 482 <<https://ssrn.com/abstract=3822367>> accessed 28 February 2023.

which dissociates from the adoption of a client-oriented protection model³² which is currently pursued by the legislator to better protect investors.³³

On the foundation of the Action Plan, the EU - to reorient capital flows towards a more sustainable economy and then adequately finance climate protection activities to overcome climate challenges -in 2019, adopted the above-mentioned Green Deal.

1.3 SUSTAINABLE FINANCE IN THE EU CARBON NEUTRALITY PARADIGM

Finance is central for the delivery of the European Green Deal (EGD) policy package, which aims, through a series of regulations and incentives, to steer European economy towards sustainability as required by the action plan. Ursula von der Leyen in her capacity as President of the European Commission promulgated the European Green Deal, as “not just a necessity: [but] it will be a driver of new economic opportunities”³⁴. For the implementation of which, the Commission was also determinate in positioning sustainable finance “at the heart of the financial system” of the EU³⁵. This through the European Green Deal Investment Plan³⁶ which is the investment pillar of the EU Green Deal. However, the two Financing the transition and Leave no one behind programs composing the Sustainable Europe Investment Plan (or Green Deal Investment Plan) were addressing only part of the transformative impact of the EU green deal. The three stages of the investment plan for the economy transformation by including i) finance mobilisation for transition through the just transition mechanism; ii) the creation of an enabling framework for private investors and the public sector to invest in sustainable investments – also providing the tools to properly identify sustainable investments (taxonomy, energy efficiency principle etc)- and iii) the support to public administrations and project promoters for sustainable projects, cannot cover the financing requirements of the EGD, which by widely

³² While action seven includes the obligation to ensure that environmental, social, and governance (ESG) factors and risks are adequately considered in investment decision-making process, as a fiduciary duty of advisors to act in the best interest of their clients.

³³ Maria Elena Salerno, 'Adding Sustainability Risks and Factors to the MiFID II Suitability and Product Governance Requirements' (2022) 8 Italian Law Journal 803.

³⁴ Ursula von der Leyen, 'The European Green Deal – our new growth strategy: Op-ed by Commission President von der Leyen' (European Commission, 11 December 2019) <https://ec.europa.eu/commission/presscorner/detail/en/ac_19_6745> accessed 28 February 2023.

³⁵ High-Level Expert Group (HLEG) on Sustainable Finance, *Interim Report 2017: Financing a sustainable European economy* (European Commission, July 2017),5.

³⁶ Commission 'Sustainable Europe Investment Plan European Green Deal Investment Plan' (Communication) COM2020/21 final.

spreading across all economy and society is going far beyond the three stages of mobilise funding, enabling, executing and no leaving behind actions. Although the EU was devoting through those pillars' investments of 750 euro billion to the green transition, the gap of at least €2.5 trillion for the 2021–2027 period was estimated³⁷, for the green transition to be adequately financed. Then the involvement of the private sector become essential for additional investments.

1.3.1 The transformative impact of the EU Green Deal

Private investments can be leveraged through the mechanisms that steers public investments, taxation, and spending towards green economy projects³⁸. Government intervention (via taxation and spending) for the natural environment, which is an ordinary public good³⁹, depends on the stability or instability of the environmental system⁴⁰ because in case of self-recovery or renewability of the environment, public resources are not needed for the provision of a quality environment. Since the creation of a political public good realises political goals, valuable to citizens because justified by human needs fulfilment⁴¹. Then, the nature of the environmental public good itself is the main factor determining both the plausible process of public investments and the realisation of public interests⁴².

In fact, if green deal prioritization of climate neutrality was an environmental goal, it would have had entailed focusing only on actions towards environmental development and restoration, -such as revitalizing ecosystems e.g. forests, biodiversity, water systems, and soil – to have emissions consistently decreasing over the long term in these sectors. Nonetheless, the European Green Deal does not primarily emphasize greenness; instead, it advocatess achieving climate neutrality by 2050⁴³ as an ambitious, proactive,

³⁷ Volker Brühl, 'Green finance in Europe—Strategy, regulation and instruments' (2021) 56(6) *Intereconomics* 323, 327 <<https://www.intereconomics.eu/contents/year/2021/number/6/article/green-finance-in-europe-strategy-regulation-and-instruments.html>> accessed 28 February 2024.

³⁸ Javier Sanchez-Reaza, Diego Ambasz, Predrag Djukic and Karla McEvoy, *Making the European Green Deal Work for People: The Role of Human Development in the Green Transition* (World Bank Group 2023) 188 <<http://hdl.handle.net/10986/39729>> accessed 26 June 2024.

³⁹ Ordinary public goods have both characteristics of non-excludability and non-rivalry of use Paul A. Samuelson, 'The Pure Theory of Public Expenditure' (1954) 36 *Review of Economics and Statistics* 387; Paul A. Samuelson, 'A Diagrammatic Exposition of a Theory of Public Expenditure' (1955) 37 *Review of Economics and Statistics* 350.

⁴⁰ Randal G. Holcombe, 'A Theory of the Theory of Public Goods' (1997) 10 *Review of Austrian Economics* 1.

⁴¹ J. Roland Pennock, 'Political development, political systems and political goods.' (1966) 18 (4) *World Politics*, 420.

⁴² Daphna Lewinsohn-Zamir, 'Consumer Preferences, Citizen Preferences and the Provision of Public good' (1998) 108 (2) *The Yale Law Journal*, 377.

⁴³ For which the vision was set through the strategic vision of: The Commission to The European Parliament, The European Council, The Council, The European Economic and Social Committee, The Committee of

and comprehensive target aimed at driving the overall transformation of the economy and society to reach decarbonisation as overarching political goal but with a fragile regulatory process⁴⁴. Indubitably, the Green Deal represents a powerful effort to provide the regulation and incentives to nudge the European society towards a circular and more sustainable economy⁴⁵. However, for the green transition to be ultimately attainable, an unavoidable behavioural change in investment decisions is needed to support both climate action and human development, fostering skills and moral growth, to encourage a shift in investors preferences in favour of sustainable and environmentally friendly behaviours in the long term⁴⁶.

The Green Deal's decarbonisation objective is a public good produced through a strong legal and political process, which becomes the external factor leading individuals' transition towards green by conscious action against one's own judgment creating the shift from private consumption goals to action in the public interest and vice versa⁴⁷. These individuals, who consider others' welfare in choices - defined as altruistic – are motivated by the perception that its own welfare and the environment are directly increased by the interaction with others⁴⁸. Although, frequently, the production of a public good will benefit some but make others worse off, the fact that is politically created for the collectivity can be considered as a weak form of contractarianism in which the initial bargaining position is created by the moral terms⁴⁹ that make the natural environment a public interest.

Then all legislative instruments becoming crucial to ensure legitimacy of policies and public buy-in for implementation of green deal climate measures. The Commission, to achieve the green deal transformative goal, included mechanisms from legally weak tools (in the form of recommendation) to strong regulatory instruments (in the form of delegated legislation) as well as reserved both traditional technical measures of EU legal order (non-binding

The Regions and The European Investment Bank. 'A Clean Planet for All. A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy' (Communication) COM (2018) 773 final.

⁴⁴ Edoardo Chiti, 'Managing the Ecological Transition of the EU: The European Green Deal as a Regulatory Process' (2022) 59 *Common Market Law Review* 19.

⁴⁵ Javier Sanchez-Reaza Diego Ambasz, Predrag Djukic and Karla McEvoy, *Making the European Green Deal Work for People: The Role of Human Development in the Green Transition* (World Bank Group 2023) 188 <<http://hdl.handle.net/10986/39729>> accessed 26 June 2024.

⁴⁶ Valentin Luz, Victor Schauer and Martin Viehweger, 'Beyond preferences: Beliefs in sustainable investing' (2024) 220 *Journal of Economic Behaviour & Organization* 584.

⁴⁷ Harry G. Frankfurt, 'Freedom of the Will and the Concept of a Person' (1971) 68 (1) *The Journal of Philosophy* 5; Albert O. Hirschman, *Felicità privata e felicità pubblica* (3rd edition, trad. di Joseph Sassoon, Il Mulino, Bologna 2013) 171.

⁴⁸ Gary S. Becker, 'A Theory of Social Interactions' (1974) 82(6) *Journal of Political* 1063.

⁴⁹ Robert Sugden, 'Contractarianism and Norms' (1990) 100(4) *Ethics* 768.

measures, strategies, open coordination), and conceived more innovative ones (empowerment of citizens and call for political mobilization)⁵⁰.

The top-down legal approach - as described in the following paragraphs two and three – is essential to put in place the green transition, but successful implementation also requires policies at other levels of government to be aligned and organised to prepare societies for climate action⁵¹. The legal framework also includes instruments to engage investors in the green transition process by expressing their altruistic preferences to contribute to the decarbonisation of the economy, such as the suitability assessment⁵². However, although, the instrument to assess investors sustainability preferences is in place, the realisation of their revealed preferences could be impacted by some behavioural biases related to investors' loss aversion for green investments and their evaluation of the future considering climate change. The assessment, evaluation and prioritisation of sustainability preferences, in this research, is then analysed together with behavioural biases to make possible the identification of mitigation actions against these biases, providing financial institutions and policymakers with better insights on how to guide investors and offer appropriate financial instruments within a suitable policy environment.

1.3.2 Climate neutrality adoption

Is through the adoption of the European Climate Law⁵³ that the green deal climate neutrality objective became legally binding in 2021. Both Union institutions and the Member States committed to take all necessary measures needed to collectively achieve it⁵⁴. The new climate law also legislated how to

⁵⁰ Andrea Giorgi, 'Substantiating or Formalizing the Green Deal Process? The Proposal for a European Climate Law' (2021) 1 *Rivista Quadrimestrale Di Diritto Dell'ambiente - Saggi* – 14; Francesca Colli, 'A Transition for the Citizens? Ensuring Public Participation in the European Green Deal' (2021) *European Policy Briefs* 68 (4) <<https://www.egmontinstitute.be/app/uploads/2021/04/EPB68.pdf?type=pdf>> accessed 2 February 2023.

⁵¹ Javier Sanchez-Reaza Diego Ambasz, Predrag Djukic and Karla McEvoy, *Making the European Green Deal Work for People: The Role of Human Development in the Green Transition* 117 (World Bank Group 2023) 188 <<http://hdl.handle.net/10986/39729>> accessed 26 June 2024

⁵² See paragraph 1.6.5 of this chapter for more information on the suitability assessment.

⁵³ Article 2 (1): Climate-neutrality objective: "Union-wide emissions and removals of greenhouse gases regulated in Union law shall be balanced at the latest by 2050, thus reducing emissions to net zero by that date". Council Regulation EU 1119/2021 of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations 401/2009/EC and 1999/2018 'European Climate Law' [2021] OJ L243/1.

⁵⁴ Article 2 (2): "The relevant Union institutions and the Member States shall take the necessary measures at Union and national level respectively, to enable the collective achievement of the climate-neutrality objective set out in paragraph 1, taking into account the importance of promoting fairness and solidarity among Member States [...]". "European Climate Law".

reach climate neutrality by 2050 through its articles 10, 11 and 15. These articles established in what manner Member States shall prepare a 30-year prospective strategy and goals harmonised with the Union climate neutrality objective. This by involving overall economic sectors contribution, establishing a multilevel climate and energy dialogue to discuss the achievements⁵⁵ and resolve the case of any inconsistency between a Member State's measures and the EU⁵⁶. Furthermore, the first draft of the European climate law⁵⁷ also empowered the Commission to review the trajectory toward the climate neutrality objective every five years starting in 2023.

In this context, the role of the European Union and the EU Member States is essential in sustaining the tangible commitment and providing resources to support climate action and green transition of the EU and of each country. At the European Union level coordination of climate action -when justified considering the possibilities available at the national, regional or local level- could strive to achieve long-term climate goals in a cost-effective manner, while maintaining fairness and environmental integrity⁵⁸. Although, climate neutrality became – with point 16 of the Climate Law- a tool designated to not only to protect the environment but also to affirm the EU's leadership role in the global battle against climate change as the “Union is a global leader in the transition towards climate neutrality, and it is determinate to help raise global ambition and to strengthen the global response to climate change, using all tools at its disposal, including climate diplomacy [...]”⁵⁹. This is possible also because the Union system is closer to the intergovernmental approach to negotiation than national democracies, which can only accept or reject norms, furthermore, national government decisions in international matters are less accountable to citizens than national ones⁶⁰. Although international treaties can be translated into national law and supported by court rulings, strengthening the binding force of legal international regulations needs public

⁵⁵ Marco Siddi, 'The European Green Deal: Assessing Its Current State and Future Implementation' (2020) Finnish Institute of International Affairs Working Paper 114 <https://www.fiaa.fi/wpcontent/uploads/2020/05/wp114_european-green-deal.pdf> accessed 6 August 2021; Marco Siddi, 'A Green Revolution? A Tentative Assessment of the European Green Deal' (2021) 16(3) International Organisations Research Journal 85.

⁵⁶ Article 6(2) and (3) 'European Climate Law'.

⁵⁷ Commission 'European Climate Law' (Communication) COM (2020) 80 final Proposal for a Regulation establishing the framework for achieving climate neutrality and amending Regulation EU 1999/2018.

⁵⁸ Anna Laura Rum, 'How to make the European New Green Deal work: legal instruments for the environmental sustainability' (2024) 16(6) *Il diritto amministrativo Rivista giuridica*; Sebastian Oberthür 'Hard or Soft Governance? The EU's Climate and Energy Policy Framework for 2030' (2019) 7(1) *Politics and Governance* 17.

⁵⁹ Point 16 'European Climate Law'.

⁶⁰ Deirdre Curtin, 'The Constitutional structure of the Union: a Europe of bits and pieces' (1993) 30 *Common market law review* 17.

debate for credibility⁶¹. Then, the green deal through the governance process of the energy market - called the energy union as for the Regulation EU 1999/2018 EU⁶²- is actively involving all relevant stakeholders, including investors, to be engaged in the discussion of the different scenarios envisaged for energy and climate policies. Such a governance mechanism, which should build on existing national structures for energy, it also improved the role and rights of consumers and investors⁶³.

1.3.3 First EU alignment to climate targets

As for the above paragraph, is the climate law that made the goals set by the European Green Deal – zero net emissions and the achievement of climate neutrality by 2050 – binding for the EU and for the Member States. It also set the intermediate targets for reducing emissions a (compared to 1990 levels), collectively committing Member States to reduce net greenhouse gas emissions by at least 55% by 2030⁶⁴.

The Green Deal, by establishing the framework for achieving climate neutrality through the climate law, directly affected the EU energy governance models. However, it did so also indirectly, with the Fit-for-55 proposals, by adjusting new and revised existing energy and climate policies⁶⁵. Such as, reforming the Emissions Trading System (ETS) and legislating on renewable energies and on energy efficiency, up to the introduction of a carbon borders adjustment mechanism and the establishment of a Social Fund for the Climate. Then, the overall Green Deal package was to be considered a pillar of the EU economic growth and modernisation strategy not just a way to impose extra costs or restrictions on carbon-intensive activities - although carbon pricing is becoming important and could efficiently guide climate-friendly economic development with appropriate long-term price signals⁶⁶. The Fit for 55 mechanisms again highlighted the importance of the European green deal as

⁶¹ Clemens Fuest and Volker Meier, 'Green Finance and the EU-Taxonomy for Sustainable Activities: Why Using More Direct Environmental Policy Tools Is Preferable' (2022) 19(2) *The Economists' Voice* 207.

⁶² Council Regulation (EU) 1999/2018 of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 and Directives (EC) 94/22, (EC) 98/70, (EC) 2009/31, (EC) 2009/73, (EU) 2010/31/(EU) 2012/27 and (EU) 2013/30, (EC) Directives 2009/119 and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 [2018] OJ L328/1.

⁶³ Regulation (EU)1999/2018, point 12.

⁶⁴ European Council, 'Fit for 55' (*Council of the European Union*) <<https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55/>> accessed 12 February 2024.

⁶⁵ Diana Vela Almeida, Vijay Kolinjivadi, Tomaso Ferrando, Brototi Roy, Héctor Herrera, Marcela Vecchione Gonçalves and Gert Van Hecken, 'The "Greening" of Empire: The European Green Deal as the EU first agenda' (2023) 105 *Political Geography* 1.

⁶⁶ Milan Elkerbout, Christian Egenhofer, Jorge Núñez Ferrer, Mihnea Cătuți, Irina Kustova and Vasileios Rizos, 'The European Green Deal After Corona: Implications for EU Climate Policy' (2020) 6 *CEPS Policy Insight* < <https://www.ceps.eu/ceps-publications/the-european-green-deal-after-corona/>> accessed 10 February 2024.

an instrument of EU's global economic policy, by strengthening further the EU political role towards the achievement of environmental international global targets such as Paris agreement⁶⁷ and the UN Sustainable Development Goals (SDGs)⁶⁸.

1.3.4 The EU transition to a sustainable economy

Nonetheless, in the context of the consultation on the renewed sustainable finance strategy⁶⁹, in April 2020, the Commission recognised that the financial system was not transitioning fast enough towards the international targets. "Substantial progress still needs to be made to ensure that the financial sector genuinely supports businesses on their transition path towards sustainability, as well as further supporting businesses that are already sustainable"⁷⁰.

Then, to reach the climate neutrality goal, the renewed EU sustainable finance strategy added further actions to the fundamentals of the action plan, to complement the green deal investment plan and support its implementation. To integrate the main foundations of the action plan – such as the taxonomy, the disclosure framework, and some tools (benchmarks, standards, and labels) - the renewed sustainable finance strategy introduced four additional main actions⁷¹, for the financial sector to both support private finance flows towards sustainable economic activities and scale up public sector capacity.

Strategic objective two, in particular, grouped the actions that will empower the retail sector and SMEs to access sustainable finance by giving them the right tools and incentives to access transition finance. These instruments spans from defining a sustainable finance network to empower retail and SMEs for access to sustainable finance, embracing a social taxonomy and digital economy leverage, as well as promoting a better insurance coverage for

⁶⁷ UNFCCC 'Paris Agreement' (unfccc.int, November 2015) <https://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english.pdf> accessed 15 February 2024; Shelagh Whitley, Joe Thwaites, Helena Wright and Caroline Ott, *Making finance consistent with climate goals insights for operationalising Article 2.1c of the UNFCCC Paris Agreement* (Overseas Development Institute, 2018); Daniel Bodansky 'Paris Agreement' (*United Nations Audio-visual Library of International Law*, 2021) <<https://legal.un.org/avl/>> accessed 15 February 2024.

⁶⁸ Department of Economic and Social Affairs Sustainable Development, 'United Nation the 17 goals' (*United Nation*, 2015) <<https://sdgs.un.org/goals>> accessed 15 February 2024.

⁶⁹ Commission 'Strategy for Financing the Transition to a Sustainable Economy' (Communication) COM (2021) 390 final.

⁷⁰ European Commission, 'Consultation on the renewed sustainable finance strategy' (*European Union*, 08 April 2020) <https://finance.ec.europa.eu/regulation-and-supervision/consultations/2020-sustainable-finance-strategy_en> accessed 10 February 2024.

⁷¹ Danny Busch, Guido Ferrarini, and Seraina Grünwald, 'Sustainable Finance in Europe: Setting the Scene' in Danny Busch, Guido Ferrarini, and Seraina Grünwald (eds.), *Sustainable Finance in Europe*, EBI Studies in Banking and Capital Markets Law, (Springer Nature Switzerland, 2021) 512.

environment and climate protection risk. While in the transition report, to which the renewed strategy referred to, also made a reference to the disclosure, by citing Art. 8 of the Delegate Act No. 2178/2021⁷², and recommending that requested reporting requirements on SMEs and households should balance burden and information, while no reference is formulated to climate neutrality.

The European Economic and Social committee, in the analysis of this point of the strategy “welcomes the objective of making it easier for retail investors and SMEs to access sustainable finance and notes the importance of ensuring fair financing conditions”⁷³. While in the Special Report the European Court of Advisors was recommended that Commission's actions and measures of the Sustainable Finance Strategy, shall empower the retail sector, by more specifically, generating a pipeline of sustainable projects⁷⁴ through de-risking mechanisms provision, advisory services as well as green budgeting and risk-sharing mechanisms.

Thenceforth, although, the goal of the strategy is redirecting investments to contribute to the EU's transition to a sustainable economy, from the above analysis resulted that the plurality of identified tools to be used in case of retail investors and SMEs, did not effectively create access to finance for investors and SMEs to transit to a sustainable low carbon economy. As an example, where the matter has been addressed by using disclosure tools, such as adopting sustainability preference through the emended MiFID suitability assessment⁷⁵, this did not generate by itself a pipeline of sustainable investment. In fact, although this is a tool on which to leverage to steer investors' preferences towards sustainable investments⁷⁶, the current

⁷² Commission Delegated Regulation (EU) 2178/2021 of 6 July 2021 supplementing Regulation (EU) 2020/852/2020 of information to be disclosed by undertakings subject to Articles 19a or 29a of Directive (EU) 2013/34 concerning environmentally sustainable economic activities and specifying the methodology to comply with that disclosure obligation [2021] OJ L443/9.

⁷³ European Economic and Social Committee (EESC), ‘Renewed sustainable finance strategy’ (*European Union*, 8 December 2021) <<https://www.eesc.europa.eu/en/our-work/opinions-information-reports/opinions/renewed-sustainable-finance-strategy>> accessed 10 February 2024.

⁷⁴ European Court of Auditors, ‘Sustainable finance: More consistent EU action needed to redirect finance towards sustainable investment’ (European Union 2021) special report n.22 Annex IV page 70.

⁷⁵ Suitability requirements application of Article 25(2) of MiFID II and of Articles 54 and 55 of the MiFID II Delegated Regulation and of Article 1(6) Delegated Regulation 1253/2021.

⁷⁶ Francesco Adria, Nadia Linciano, Francesco Quaranta, and Paola Soccorso, ‘Profilazione della clientela ai fini della valutazione di adeguatezza. Follow up dello studio del 2012 su un campione di intermediari italiani’ (2022) CONSOB Discussion Papers 11/2022, 7 <<https://www.dirittobancario.it/wp-content/uploads/2022/11/Discussion-Paper-Consob.pdf>> accessed 10 February 2024. Example of discussion from the CONSOB study can be:

a) the customer is asked to choose a financial instrument (which among other things, in the event of a non-choice, could not provide a green default) sustainability of which is assessed in a second step. First the financial profile and then with the same profile the preference for sustainability.

regulatory framework for sustainable finance did not offer quantitative criteria to measure the degree of sustainability of financial products⁷⁷ for the investor to grade and chose accordingly.

Sustainability preferences assessment, evaluation and prioritisation are one of the main objective of this research because it is considered that their relevance is not adequately registered in the suitability assessment and that the analysis of climate change risk perception biases, sustainability illiteracy of both financial advisors and investors and methodological discrepancies (questions framing and formulation, green default, etc.) can help in creating an effective instrument able to really steer investment towards investors sustainability preferences.

1.3.4.1 The importance of a green default option for retail investors

Furthermore, interestingly enough, most respondents (63%, 227 over the total of 361)⁷⁸ during the Consultation on the Renewed Sustainable Finance Strategy agreed that retail investors should be systematically offered sustainable investment products, when available, at a comparable cost and if those products meet the suitability test. To confirm the results, out of the total respondents (446)⁷⁹ to question 3, 305(68%) would like to be systematically offered sustainable investment products as a default option by financial advisers, only 14(3%) answered no and 127 (28%) did not have an opinion or knowledge on the matter or thought the matter was not relevant. Stakeholders who supported the systematic offering of sustainable investment products as a default belonged 80% of academics (spread across 8 stakeholders), 100% of consumer organisations (7 stakeholders), 85% of NGOs/civil society (50 stakeholders) and 75% of trade unions (3 stakeholders). While only 52% financial and other companies/business organisations (52 stakeholders) agreed, and a majority of business associations (54 stakeholders, 69%) and

b) from the analysis of the elaborated profiles, it appears that the distribution of the profiles tends towards more prudential profiles, and it is not clear whether long-term investments are considered high-risk and therefore mostly excluded, or if this type of assessment is not included.

c) The interaction with the intermediary is important as the compilation takes place on site and possibly only the online renewal independently, there were no rules of conduct or guidelines to prepare the financial advisor on how to respond if control questions (if existent) are incorrect.

⁷⁷ Volker Brühl, 'Green Financial Products in the EU – A Critical Review of the Status Quo' (2022)57(4) *Intereconomics* 252.

⁷⁸ European Commission, 'Consultation on the renewed sustainable finance strategy. Summary of responses.' (*European Union*, 10 February 2021). <https://commission.europa.eu/documents_en?f%5B0%5D=document_title%3AConsultation%20on%20a%20renewed%20sustainable%20finance%20strategy%20> accessed 10 February 2024. Question n.50-page 47.

⁷⁹ European Commission 'Consultation on the renewed sustainable finance strategy. Summary of responses.' Question 3-page 17.

public authorities (9 stakeholders, 53%) responded that they did not know/ had no opinion in response to this question⁸⁰.

Furthermore, with question 2 stakeholders were consulted on if they knew if some of their pension, life insurance premium or any other personal savings was invested in sustainable financial assets. The largest share of stakeholders affirmed to not know it. Those who responded “Yes”, specified that they actively searched for that information or that the information was made available and adequate. While most of those that responded “No”, called for more transparent information and in general more information about the environmental/social impact and less greenwashed information, and some called for a proper option to invest sustainably (wanting sustainable assets as default)⁸¹. The use of a default option aligned with investors suitability profile, can on one side increase the subscription of green products, but on the other, if not properly structured, can potentially lead to the creation of stranded assets⁸².

All the above stimulated further research on the possibility of structuring a green default to be possibly inserted in the suitability assessment. Literature, and ethical analysis for default implementation for financial services is described in chapter II at paragraphs 2.3.5 and 2.4.5, while the elaboration of a green default for policy implementation is described on paragraph 3.5.1 of Chapter III.

1.3.5A further step towards completing the sustainable finance framework.

Through Communication 2023/217⁸³ the Commission supported a sustainable finance package⁸⁴, which wanted to enhance transparency in the sustainable investment market i) by finalising the taxonomy - introducing the four environmental activities – and ii) by forwarding new regulations for Environmental, Social, and Governance (ESG) rating providers. Through this

⁸⁰ European Commission, ‘Consultation on the renewed sustainable finance strategy. Summary of responses.’ Question 3-page 17.

⁸¹ European Commission, ‘Consultation on the renewed sustainable finance strategy. Summary of responses.’ Question 2-page 17.

⁸² Veerle Colaert, ‘Integrating Sustainable Finance into the MiFID II and IDD Investor Protection Frameworks’ (2022) KU Leuven, Jan Rose Institute for company & financial law 6/2020 19 <<https://tinyurl.com/7a6mbtbn>> accessed 28 June 2024.

⁸³ Commission ‘A sustainable finance framework that works on the ground’ (Communication) COM (2023) 317 EU final.

⁸⁴ European Commission, ‘Sustainable Finance Package’ (*European Union*, 13 June 2023) <https://finance.ec.europa.eu/publications/sustainable-finance-package-2023_en> accessed 12 February 2024.

package the Commission also attempted to secure that the sustainable finance framework could reach companies seeking investments in their transition to sustainability. Through the Environmental Taxonomy Delegated Act⁸⁵ adoption by enlarging the aligning criteria of investments in environmentally economic sustainable activities - including activities and associated criteria for all six environmental objectives of the Taxonomy Regulation⁸⁶ - influenced the formation of investors' sustainability preferences for investments⁸⁷.

1.4 THE DISCLOSURE FRAMEWORK TO PROVIDE INVESTORS WITH INFORMATION FOR SUSTAINABLE INVESTMENT CHOICES.

The lack of a homogeneous measurement makes evaluation and comparison of sustainable investment options (and their alignment with the individual's objectives) arduous. Then it is against this difficulty, which could discourage the sustainable investments needed to achieve implementation of the action plan, that the Commission updated the reference regulatory framework, by guaranteeing the transparency of information, with the Sustainable Finance Disclosure Regulation (SFDR)⁸⁸.

The SFDR, as a transparency regulation, mandates financial market participants and advisers⁸⁹ to disclose how sustainability risks impact investment value and returns ("outside-in") and how investments affect the

⁸⁵ Commission Delegated Regulation 2486/2023 of 27 June 2023 supplementing the Taxonomy Regulation by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to the sustainable use and protection of water and marine resources, to the transition to a circular economy, to pollution prevention and control, or to the protection and restoration of biodiversity and ecosystems and for determining whether that economic activity causes no significant harm to any of the other environmental objectives and amending Commission Delegated Regulation (EU) 2178/2021 as regards specific public disclosures for those economic activities supplementing Regulation 852/2020. 'Environmental Taxonomy' [2023] OJ L2023/2486/1.

⁸⁶ Which are sustainable use and protection of water and marine resources, the transition to a circular economy, pollution prevention and control, the protection and restoration of biodiversity and ecosystems. For more details see paragraph 5 on the EU Green Taxonomy.

⁸⁷ The enlarged overall six environmental criteria, are the base of the company's description used for this research questionnaire as detailed in chapter II.

⁸⁸ 'SFDR'; Commission Delegated Regulation (EU) 1288/2022 supplementing Regulation (EU) 2088/2019 regulatory technical standards specifying the details of the content and presentation of the information in relation to the principle of 'do no significant harm'[2022] OJ L196/1; Commission Delegated Regulation (EU) 363/2023 amending and correcting the regulatory technical standards Delegated Regulation (EU) 1288/2022 content and presentation of information in relation to disclosures in pre-contractual documents and periodic reports for financial products investing in environmentally sustainable economic activities. [2023] OJ L50/3.

⁸⁹ 'SFDR' Article 2(1) and (11).

environment and society ("inside-out"). The disclosure mandating requirements apply to Undertakings for Collective Investment in Transferable Securities (UCITS)⁹⁰, Alternative Investments Funds (AIFs)⁹¹, separately managed portfolios, advisory mandates, and financial advice offered within the EU or by an EU investment firm⁹² including economic activities⁹³ - the general equity or debt of an investee company⁹⁴. It is the responsibility of financial market participants to identify which financial products fall under Regulation (EU) 2019/2088 and the corresponding disclosure requirements at pre-contractual stage, periodic reporting, and advisor website.

Products, claiming environmental or social characteristics must disclose the information and methodology used for the calculations to be classified under article 8. While funds that have sustainable investment as their objective must disclose how the objective is met, the methodology used and report also on the referred benchmarks to claim the categorisation under article 9. Additionally, both Article 8 and 9 products' contents reporting must include information on Taxonomy alignment to avoid double counting. Non-sustainable products can still be sold in the EU, labelled under Article 6, as funds that do not integrate sustainability into their investment processes, for example by including non-ESG stocks, such as tobacco and mining businesses. Furthermore, as for article 6(1) and (3) financial market participants must provide pre-contractual disclosures and periodic reports⁹⁵ for each product (Article 6,8 and 9), on transparency of which the communication channel differs at product level – to be included in pre-contractual documentation (e.g., brochures), periodic reports and/or website disclosure- and at entity level – to be provided at entity's website level⁹⁶- showing

⁹⁰ Council Directive (EC) 2009/65 of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities 'UCITS' (recast). [2009] OJ L 302/32.

⁹¹ Council Directive (EU) 2011/61 of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41 (EC) and 2009/65 (EC) and Regulations (EC) No 1060/2009 and (EU) No 1095/2010. 'AIFMD' [2011] OJ L 174/1.

⁹² 'SFDR' Article 2(12)

⁹³ 'SFDR' Article 2, point (17),

⁹⁴ ESAs Joint Committee, 'Consolidated Questions and Answers - Q&A - on the SFDR (Regulation (EU) 2019/2088) and the SFDR Delegated Regulation (Commission Delegated Regulation (EU) 2022/1288)' (JC 2023), 17 Q1.

⁹⁵ 'SFDR' Article 11(2).

⁹⁶ The European Supervisory Authorities (ESAs) created Regulatory Technical Standards (RTS) templates for disclosure requirements channels specification. The first introduced templates for pre-contractual and periodic reporting, while the latest included a template for PAI reporting. ESAs Joint Committee 'Final Report on draft Regulatory Technical Standards with regard to the content, methodologies and presentation of disclosures pursuant to Article 2a(3), Article 4(6) and (7), Article 8(3), Article 9(5), Article 10(2) and Article 11(4) of Regulation (EU) 2019/2088' (JC 2021) 03; ESAs Joint Committee 'Final Report on draft Regulatory Technical Standards with regard to the content and presentation of disclosures pursuant to Article 8(4), 9(6) and 11(5) of Regulation (EU) 2019/2088' (JC 2021) 50; Commission Delegated Regulation (EU) 1288/2022 of 6 April 2022 supplementing Regulation (EU) 2088/2019 regulatory technical standards specifying the

information about sustainability policies and sustainability risks integration into investment decision-making process and financial advice. .

The SFDR regulation was aimed to integrate sustainability risks in the principal-agent relationships to reduce information asymmetries. Sustainability risk “means an environmental, social or governance event or condition that, if it occurs, could cause an actual or a potential material negative impact on the value of the investment.”⁹⁷ Since sustainability risks may influence at the same time the value and return of investments (the so called outside-in perspective) as well as, create adverse sustainability effects on the environment and society at large (the inside-out perspective), advisers must inform investors on their approach to both the assessment and the disclosure of sustainability risks. This also in the application of the double materiality principle⁹⁸.

If sustainability risk is no relevant to a financial product, an explanation should be provided. In the opposite, if a potential impact risks on product’s performance is assessed shall be disclosed, either qualitatively or quantitatively, as part of the pre-contractual disclosures made by financial advisers. Therefore, sustainability risks must be disclosed to end investors by financial advisers before offering investment advice, regardless of the investors' sustainability preferences.

Sustainability risks disclosure for financial advisers includes: (i) the description of the method used to integrate sustainability risks into their investment or insurance advice; and (ii) the results of the assessment of the likely impacts of sustainability risks on the returns of the financial products on which they advised on.⁹⁹ All information must be presented in a clear, concise, standardized, non-misleading manner, and in a searchable electronic format to enhance investors' comprehension through the dedicated channels of communication.

The SFDR, although do not formulate the obligation to prioritize ESG criteria during investment decisions, it establishes regulations that required financial adviser to substantiate the sustainability compliance regarding their financial

details of the content and presentation of the information in relation to the principle of 'do no significant harm'[2022] OJ L196/1.

⁹⁷ 'SFDR' point (14).

⁹⁸ “Companies have to report not only on how sustainability issues might create financial risks for the company (financial materiality), but also on the company’s own impacts on people and the environment (impact materiality)” European Commission, ‘Sustainable finance. Double materiality’ (*Newsroom*, 26 July 2022) < <https://ec.europa.eu/newsroom/fisma/items/754701/en>> accessed 8 February 2024.

⁹⁹ Danny Busch, ‘Sustainable Finance Disclosure in the EU Financial Sector’ (2020) 70 EBI Working Paper Series 18 < https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3650407#> accessed 8 February 2024.

offerings. Considering ‘the two distinct product categories [...] key to determine the access of end investors to financial products [...] ambitious enough to meet their sustainability preferences’¹⁰⁰. However, funds that promote environmental or social characteristics (Article 8) and funds that have sustainable investment as their objective (Article 9), classifications are not based on strict qualification criteria¹⁰¹. As well as for Article 6, which defines funds without a sustainability scope. These definitions are considered challenging for retail investors. Then, although, a disclosure system is in place, without an efficient standardisation measure that enable measurement and comparison, there could be a consequent risk of greenwashing¹⁰².

In fact, product documentation must include information on how the financial product comply with the ‘sustainable investment’ objective as stated by Article 2, point (17), SFDR such as “an investment in an economic activity that contributes to an environmental objective [...] or an investment in an economic activity that contributes to a social objective [...] or an investment in human capital or economically or socially disadvantaged communities, provided that such investments do not significantly harm any of those objectives and that the investee companies follow good governance practices [...]”¹⁰³. But the definition is showing a focus solely on portfolio-based products, rather than encompassing equity, bonds, and other “general purpose” financial instruments that can also form part of a portfolio¹⁰⁴. Furthermore, the Commission clarified¹⁰⁵ that not a unique methodology is identified by the SFDR for sustainable investments. In fact, ‘sustainable investments’ also includes investments into ‘environmentally sustainable economic activities’ as for Regulation (EU) 2020/852. In particular, the social elements of the ‘do no

¹⁰⁰ ESAs Joint Committee, ‘Consolidated Questions and Answers - Q&A - on the SFDR (Regulation (EU) 2019/2088) and the SFDR Delegated Regulation (Commission Delegated Regulation (EU) 2022/1288)’ (JC 2023), 30 Q1.

¹⁰¹ Maria Cristina Quirici, ‘Is there a risk of greenwashing in the application of the EU SFDR in the SRI fund industry? Some critical issues’ (97th International Scientific Conference on Economic and Social Development - “Modern technologies and innovative concepts in the function of promoting cultural heritage” – Varazdin, 2023) <https://www.esd-conference.com/upload/book_of_proceedings/Book_of_Proceedings_esdVarazdin2023_Online.pdf#page=192> accessed 28 June 2024.

¹⁰² For more information on greenwashing, see Eugenia Macchiavello, “Greenwashing” in investment intermediation: investor protection and the difficult role of enforcement’ (2024) University of Genoa EUSFiL Law Research Working Paper Series No. 28 <<https://ssrn.com/abstract=4957242>> accessed 24 October 2024.

¹⁰³ ‘SFDR’ Article 2(17).

¹⁰⁴ Veerle Colaert, Integrating Sustainable Finance into the MIFID II and IDD Investor Protection Frameworks, forthcoming in Kern Alexander, Matteo Gargantini & Michele Siri (eds.) *The Cambridge Handbook of EU Sustainable Finance: Regulation, Supervision and Governance* (CUP, forthcoming 2024).

¹⁰⁵ ESAs Joint Committee, ‘Consolidated Questions and Answers - Q&A - on the SFDR (Regulation (EU) 2019/2088) and the SFDR Delegated Regulation (Commission Delegated Regulation (EU) 2022/1288)’ (JC 2023), 30 Q1.

significant harm' principle conform at entity level with the compliance with minimum safeguards as for EU Taxonomy, article 18 (2)¹⁰⁶.

The above introduced Do Not Significant Harm (DNSH) principle is connected to the disclosure of Principal Adverse Impacts (PAIs)¹⁰⁷ of investment decisions on sustainability factors, the very same definition of sustainable investment¹⁰⁸ is leaving the meaning of contribution and significantly harm undefined¹⁰⁹. Further clarification is made by the ESMA report on DNSH¹¹⁰, definition and criteria, which clarifies the close link between the SFDR DNSH disclosures and the Taxonomy Regulation, asking the SFDR DNSH to disclose additional information on the alignment of the investments with the minimum safeguards set out in the Taxonomy Regulation¹¹¹. The case of SFDR, DNSH principle is relevant for financial products disclosing under Article 9 and financial products disclosing under Article 8, to the extent that they make sustainable investments, and is explained by the indicators for adverse impacts (PAI) set for climate, environment related and social and employee, respect for human rights, anti-corruption and anti-bribery matters indicators as included in Annex I of CDR 2022/1288¹¹². But further standardisation and interpretation of the above terms is left to financial advisors as long as is done in a coherent way and applied to all products¹¹³.

Yet, financial market participants (FMPs) can still consistently retain the option to refrain from considering the adverse impacts of investment decisions on

¹⁰⁶ Commission Notice on the interpretation and implementation of certain legal provisions of the EU Taxonomy Regulation and links to the Sustainable Finance Disclosure Regulation (Communication) C/2023/3719 OJ C 211,1, 5.

¹⁰⁷current value of all investments" should be understood to mean both direct and indirect investments funding investee companies or sovereigns through funds, funds of funds, bonds, equity instruments, derivative instruments, loans, deposits and cash or any other securities or financial contracts. ESAs Joint Committee, 'Consolidated Questions and Answers' 30.

¹⁰⁸ Article 2(17) 'SFDR'.

¹⁰⁹ ESAs Joint Committee, 'Consolidated Questions and Answers - Q&A - on the SFDR (Regulation (EU) 2019/2088) and the SFDR Delegated Regulation (Commission Delegated Regulation (EU) 2022/1288)' (JC 2023) 18, Q&A II.2: 'The SFDR does not set out minimum requirements that qualify concepts such as contribution, do no significant harm, or good governance, i.e. the key parameters of a 'sustainable investment'.

¹¹⁰ European Securities and Market Authority, "Do No Significant Harm' definitions and criteria across the EU Sustainable Finance framework' (ESMA 2023) 30-379-2281.

¹¹¹ which assessment is carried out at the level of the economic activity with the help of the Technical Screening Criteria introduced by the 'Climate Taxonomy' and 'Environmental Taxonomy' together with the substantial contribution to an environmental objective.

¹¹² Annex I Commission Delegated Regulation (EU) 1288/2022.

¹¹³ ESAs Joint Committee, 'Consolidated Questions and Answers - Q&A - on the SFDR (Regulation (EU) 2019/2088) and the SFDR Delegated Regulation (Commission Delegated Regulation (EU) 2022/1288)' (JC 2023) 18, Q&A 8: Financial market participants must carry out their own assessment for each investment and disclose their underlying assumptions. This policy choice gives financial market participants an increased responsibility towards the investment community and means that they should exercise caution when measuring the key parameters of a "sustainable investment'.

sustainability factors¹¹⁴ in their investment advice. While all products must comply on the integration of sustainability risks and principal adverse impacts (PAIs) for each Article 6, 8, and 9 products, in pre-contractual disclosures, it is compulsory to financial market participants to consider and report on PAIs for Article 8 and 9 products but not for Article 6. As well as small FMPs¹¹⁵ are released from considering PAIs for Article 8 and 9 products. Although, if this is the case, explanations must be provided. Although impacts on sustainability factors, can be caused by investments pursued by the chosen financial instruments, investment firms shall explain to clients or potential clients the consideration of Principal Adverse Impacts (PAI) on sustainability factors by disclosing on the website relevant qualitative or quantitative indicators, for all investment decisions related to all financial products managed and offered, together with a consolidated value at company level. including but not limited to those in accordance with the SFDR¹¹⁶. However, the consistency between the selected PAIs and the level of sustainability ambition of the financial products, would not be an efficient standardisation measure, but only a labelling proxy for sustainability communication purposes.

Although, the ESAs provided some clarifications¹¹⁷ further improvements are expected with the ongoing process of SFDR review¹¹⁸. In fact, during the consultation the Commission launched for the SFRD review in September 2023¹¹⁹, some financial sector institutions developed an advocacy position toward a better EU categorisation system in alignment to the EU Taxonomy, relying on a minimum criteria of ESG level contribution, to be included in the SFDR to enable end investors to identify and compare financial products that

¹¹⁴ Sustainability factors as for article 2(24) 'SFDR', 'mean environmental, social and employee matters, respect for human rights, anti-corruption, and anti-bribery matters.

¹¹⁵ with less than 500 employees.

¹¹⁶ Point (20) 'SFDR'.

¹¹⁷ European Securities and Market Authority, 'Joint Consultation Paper - Review of SFDR Delegated Regulation Regarding PAI and Financial Product Disclosures' (ESMA 2023) JC 2023 09, 31.

European Securities and Market Authority, 'Questions and Answers on MiFID II and MiFIR Investor Protection and Intermediaries Topics' (ESMA 2020) 35-43-349. The European Supervisory Authorities (ESAs) believe that terms such as sustainable objective and promotion of characteristics, the notion of other investments aligned with Environmental and Social characteristics, the concept of Principal Adverse Impacts (PAI) should be better defined and explained.

¹¹⁸ European Supervisory Authorities Joint Committee, 'Final Report on draft RTS on the review of PAI and financial product disclosures in the SFDR Delegated Regulation' (ESMA,2023) JC 2023 55. Consumer testing activities which have led to the proposal of language simplification and structure clarification for retail investors understanding.

¹¹⁹ European Commission, *Summary Report of the Open and Targeted Consultations on the SFDR assessment* (2023).

contribute to sustainability factors¹²⁰. This is also linked to the failure of the EU Ecolabel of retail financial product¹²¹.

Then, the Final Report on technical advice¹²² by the European Securities and Markets Authority (ESMA) requested further clarifications for the integration of sustainability risks and sustainability factors in Delegated Regulation (EU) 565/2017 and Commission Delegated Directive (EU) 2017/5939. The Report itself identified specific provisions in this respect, such as, incorporating ESG factors into organizational requirements and risk management to standardize approaches across firms and Member States, this to ensure consistent implementation. The advice of the Securities and Markets Stakeholder Group's (SMSG) also highlighted the lack of agreed definitions as an issue for a harmonised approach to sustainable finance¹²³. Consequentially ESMA undertook a key role in supporting this transition with a clear strategic orientation¹²⁴. This by taking ESG factors into account across the range of its activities: Single Rulebook, Supervisory Convergence and Direct Supervision; and by monitoring and assessing ESG related market developments and monitor ESG related risks (risk assessment activity)¹²⁵. However, the amendments which followed, included in the Explanatory Memorandum¹²⁶, did not add much clarity to sustainable finance products, by generally defining those as a sustainable finance instrument with some level of sustainability-related materiality¹²⁷. Then, SFDR disclosures remain complex and rely on

¹²⁰ Autorité des Marchés Financiers, 'Towards a review of SFDR' (AMF, 20 February 2024) <<https://www.amf-france.org/en/news-publications/amfs-eu-positions/towards-review-sfdr>> accessed 27 June 2024.

¹²¹ A project is included in the action plan and still ongoing (see note 34). See the European Commission, *Summary Report of the Open and Targeted Consultations on the SFDR assessment* (2023) 5: 'The vast majority of respondents (89%, 272 out of 304) agree to a very large or large extent, that the broad objective of the SFDR (i.e. to strengthen transparency through sustainability-related disclosures in the financial services sector) is still relevant today [...] However, 83% of respondents (245 out of 296) totally or mostly agree that the SFDR is currently not being used solely as a disclosure framework as intended, but is also being used as a labelling and marketing tool (in particular Article 8 and 9)'.

¹²² European Securities and Market Authority, 'Final report on integrating sustainability risks and factors in the MIFID II' (ESMA 2019) 35-43-1737.

¹²³ Securities and Markets Stakeholder Group, *ADVICE TO ESMA. ESMA Consultation Papers On integrating sustainability risks and factors in MIFID, the UCITS Directive and AIFMD* (ESMA 2019). 22-106-1683.

¹²⁴ European Securities and Market Authority, 'Strategy on Sustainable Finance' (ESMA 2020) 22-105-1052.

¹²⁵ Further information on ESMA, 'Sustainable Finance Roadmap', can be found on paragraph 1.6.5.

¹²⁶ Commission Explanatory Memorandum of Delegated Regulation C (2021) 2616 final amending Delegated Regulation (EU) 565/2017 as regards the integration of sustainability factors, risks and preferences into certain organisational requirements and operating conditions for investment firms. Page 1.

¹²⁷ 'SFDR requires a financial product's documentation to describe how its stated levels of sustainability or sustainability ambitions are to be achieved or are achieved. Whilst financial products referred to in Article 9 of the SFDR must pursue the objective of sustainable investments, with no significant harm, as defined in Article 2, point (17), of the SFDR, financial products that fall under Article 8 of the SFDR might integrate different strategies, even including those that, despite claiming environmental, social and governance (ESG), socially responsible investing (SRI) or sustainability orientation, might lack sustainability-related materiality.

concepts and language, which can be unfamiliar and unintuitive for retail investors, and difficult to understand¹²⁸. However, policymakers still have a role in helping to streamline the requirements for identified of SFDR information to make disclosure more effective¹²⁹.

1.5 THE CLASSIFICATION SYSTEM FOR GREEN ECONOMIC ACTIVITIES TO AVOID GREENWASHING INVESTMENTS.

The Taxonomy Regulation (EU)852/2020 and the following delegated acts¹³⁰ can be considered a further important step in the EU regulation regarding sustainability preferences operability. It is the taxonomy that finally provides uniformed criteria for companies and investors on economic activities that can be considered environmentally sustainable. Economic activities which qualified as environmentally sustainable according to the Taxonomy are those which contribute substantially to one or more of the six environmental eligible objectives listed 1) from article 9¹³¹ of the same regulation; or 2) qualify as substantial contribution to climate change mitigation (article 10); or 3) by directly enabling other activities to make a substantial contribution to one or more of those objectives (article 16). Additional criteria are that an activity to align with the taxonomy, A) it must not cause significant harm to any of the other environmental objectives set out in Article 9 in accordance with Article 17 of Taxonomy Regulation; B) be compliant with minimum (social) safeguards set out in Article 18(1).¹³² Then revenues, capital expenditures (CAPEXs), and operational expenditures (OPEXs) of a company are deemed as taxonomy-

Given this and given different product scopes of MiFID II, the SFDR and Taxonomy Regulation, financial instruments that have some levels of sustainability-related materiality are eligible for recommendation to the clients or potential clients who express clear sustainability preferences.' Commission Explanatory Memorandum C (2021) 2616 final. 2.

¹²⁸ David Ramos Muñoz, Marco Lamandini and Michele Siri, 'The Current Implementation of the Sustainability-related Financial Disclosures Regulation (SFDR)' (European Parliament, Luxembourg, 2024).

¹²⁹ David Ramos Muñoz, Marco Lamandini and Michele Siri, 'The Current Implementation of the Sustainability-related Financial Disclosures Regulation (SFDR)' (European Parliament, Luxembourg, 2024).

¹³⁰'Taxonomy;' Commission Delegated Regulation 2139/2021 of 4 June 2021 supplementing Regulation 852/2020 establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives. 'Climate Taxonomy' [2021] OJ L442/1; 'Environmental Taxonomy' Delegated Regulation (EU)2486/2023.

¹³¹ Which are: (a) climate change mitigation; (b) climate change adaptation; (c) the sustainable use and protection of water and marine resources; (d) the transition to a circular economy;(e) pollution prevention and control; (f) the protection and restoration of biodiversity and ecosystems.

¹³² to ensure the alignment with (i) the OECD Guidelines for Multinational Enterprises and (ii) the UN Guiding Principles on Business and Human Rights, including the principles and rights set out in the eight fundamental conventions identified in the Declaration of the International Labour Organisation on Fundamental Principles and Rights at Work and the International Bill of Human Rights, Point (35) 'Taxonomy'.

aligned only if a) the activity met the criteria of making a substantial contribution to at least one of the climate and environmental objectives, while simultaneously b) avoiding significant harm to the remaining objectives and c) meeting minimum standards for human rights and labour standards¹³³.

Although the climate taxonomy is in its implementing phase, financial institutions are still split in their ESG reporting applying taxonomy standards or developing their own in their disclosures.¹³⁴ Then disclosure-centred regulations seems to come second to market related policies (such as carbon prices, or other carbon instruments) for climate targets achievements¹³⁵ challenging effectiveness of supervisors' role.¹³⁶ Furthermore, the taxonomy did not result as a strong green deal implementation instrument, because the taxonomy currently does not provide a clear focus on climate neutrality for several of the economic activities it covers,¹³⁷ then climate neutrality does not stand as its central objective. The taxonomy generally defined environmentally sustainable investment as an investment "in one or several economic activities that qualify as environmentally sustainable under this regulation,"¹³⁸ which means all investments in the six environmental objectives are equally green. However, limited knowledge in defining environmental performance thresholds for sustainable finance at economic activity level for these environmental objectives exists.¹³⁹ Then, addressing sustainable finance as the result of investments in all environmental objectives is a work in progress which needs further update to achieve the level of climate well-established threshold for finance.¹⁴⁰ Furthermore, further qualification criteria are integrated in article 3 (a) of the same regulation for climate mitigation and adaptation investments. Then, investment categorisation, by following under different evaluation criteria,

¹³³ Article 3 'Taxonomy'.

¹³⁴ Paola D'Orazio, 'Towards a post-pandemic policy framework to manage climate-related financial risks and resilience' (2021) 21(10) Climate Policy 1368.

¹³⁵ Sebastian Steuer and Tobias Tröger, 'The role of disclosure in green finance' (2022) 8(1) Journal of Financial Regulation 1.

¹³⁶ Paola D'Orazio, 'The Politics of Climate Finance and Policy Initiatives to Promote Sustainable Finance and Address ESG Issues' in Chrysovalantis Gaganis, Fotios Pasiouras, Menelaos Tasiou and Constantin Zopounidis (eds), *Sustainable Finance and ESG* (Palgrave Macmillan Studies in Banking and Financial Institutions, 2023).

¹³⁷ Franziska Schütze and Jan Stede, 'The EU sustainable finance taxonomy and its contribution to climate neutrality' (2021) 14(1) Journal of Sustainable Finance & Investment, 128.

¹³⁸ Article 2(1) 'Taxonomy'.

¹³⁹ Paolo Canfora, Maria Arranz Padilla, Oliver Polidori, Nicolas Pickard Garcia, Suzana Ostojic and Marco Dri, *Development of the EU Sustainable Finance Taxonomy - A framework for defining substantial contribution for environmental objectives* 3-6. (European Union, 2022); Paolo Canfora, Marco Dri, Oliver Polidori, Clara Solzbacher and Maria Arranz Padilla, *Substantial contribution to climate change mitigation – a framework to define technical screening criteria for the EU taxonomy* (European Union, 2021).

¹⁴⁰ Paolo Canfora, Maria Arranz Padilla, Oliver Polidori, Nicolas Pickard Garcia, Suzana Ostojic and Marco Dri, *Development of the EU Sustainable Finance Taxonomy - A framework for defining substantial contribution for environmental objectives* 3-6. (European Union, 2022); Paolo Canfora, Marco Dri, Oliver Polidori, Clara Solzbacher and Maria Arranz Padilla, *Substantial contribution to climate change mitigation – a framework to define technical screening criteria for the EU taxonomy* (European Union, 2021).

causes investment fragmentation, which reduces their efficacy in reaching the climate neutrality objective. While it is coordination and cost effectiveness of instruments that makes, instead, a climate policy successful by enabling climate protection targets to be achieved at the lowest possible cost.¹⁴¹

Nonetheless, these regulations fostered a shift in disclosure practices that truly transformed organizations,¹⁴² motivating investors to direct their capital towards environmentally sustainable activities. This shift occurred because investors recognized that improved reporting goes beyond a mere branding exercise. The taxonomies are also mitigating the risk of labelling harmful investments as green, because the application of scientific criteria clearly identify environmental economic activity, then investors can consciously opt to invest in environmentally sustainable economic activities.¹⁴³ Nevertheless, since taxonomies regulations are not mandating for any investment commitment, and investors are free to invest in any economic activities they wish to, there could still be a gap between intentions and consequent investment decisions which could divert green investments to non-green.¹⁴⁴ In fact, even when investors are thoroughly informed and persuaded about the advantages of a particular investment, their actual investment behaviour may yield to a different outcome.¹⁴⁵ This is why this research is applying behavioural economics knowledge to understand investors' behaviours in revealing their sustainability preferences. It is considered that if the appropriate tool is in place to correctly understand individuals' preferences, this, together with transparency and disclosure, can further incentivize genuine sustainable investment practices from investors.

¹⁴¹ Clemens Fuest and Volker Meier, 'Green Finance and the EU-Taxonomy for Sustainable Activities: Why Using More Direct Environmental Policy Tools Is Preferable' (2022) 19(2) *The Economists' Voice*, 2073.

¹⁴² Holly Pettingale, Stéphane de Maupéou and Peter Reilly, 'EU Taxonomy and the Future of Reporting' (*Harvard Law School Forum on Corporate Governance*, 4 April 2022) <<https://corpgov.law.harvard.edu/2022/04/04/eu-taxonomy-and-the-future-of-reporting/>> accessed 15 February 2024.

¹⁴³ The CAPEX average percentage of European investments aligned with the taxonomy has increased in 2024 against 2023 data. Investments are particularly high (60%) especially in the utility sector - subsector if electricity products- while in the banking sector lending to aligned activities is, on average, over 50% of the assets of large EU banks. European Commission, 'The EU Taxonomy's uptake on the ground' (*European Union*, June 2024) <https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities/eu-taxonomys-uptake-ground_en> accessed 6 September 2024.

¹⁴⁴ Herwig Pilaj, 'The Choice Architecture of Sustainable and Responsible Investment: Nudging Investors Toward Ethical Decision-Making' (2017) *Journal of Business Ethics* 743.

¹⁴⁵ Herwig Pilaj, 'The Choice Architecture of Sustainable and Responsible Investment: Nudging Investors Toward Ethical Decision-Making' (2017) *Journal of Business Ethics* 743.

1.5.1 EU - UK sustainable investing regime comparison

In consideration of the fact that the implementation instrument of this study, a questionnaire,¹⁴⁶ has been designed and then disseminated in the UK, a comparison of EU and UK regulatory regimes for sustainable investing, in particular for the Green Taxonomy, is described in this paragraph to better contextualise respondents' knowledge and answers.

EU and UK regulatory regime for sustainable investment products diverge on few points, which can be summarised on disclosure frameworks, labelling, asset thresholds, sustainability objectives, anti-greenwashing rules, and taxonomy alignment.¹⁴⁷

The UK Sustainable Disclosure Regime (SDR) is a labelling regime, which currently only applies to UK domiciliated funds and the investment products they offer. The UK SDR stated goal by the Financial Conduct Authority (FCA) is to consistently labelling investments according to their claimed sustainability for Sustainability Funds with nuances from Sustainability Focus, Improvers, Impact, and Mixed Goals; then Non-labelled ESG funds, using the ESG and marketing term with no sustainability labelling adopting; and Non-ESG funds with no marketing and no labelling for sustainability.¹⁴⁸ Furthermore, for each label, an absolute measurement (70%)¹⁴⁹ of a sustainable assets threshold for investments must be included, while in the EU SFDR,¹⁵⁰ firms who declare a sustainability objective (article 9) must disclose and report on its funds objective, investments methodology, aligned with aligned with the taxonomy or disclose the promoted ESG characteristics (article 8) and calculation methodology but for both is not a labelling regime.¹⁵¹ UK firms were able to use labels from 31 July 2024; while naming and marketing

¹⁴⁶ See chapter II paragraph 2.3 and 2.4 for the description of the conceptual framework development of the instrument designed for sustainability preferences assessment, a questionnaire. The complete questionnaire is reported in Appendix I of the same chapter.

¹⁴⁷ Simon Lovegrove and Haney Saadah, 'How the EU and UK regulatory approaches to sustainability vary' (Thomson Reuters, 29 May 2024) <<https://www.thomsonreuters.com/en-us/posts/esg/eu-uk-regulatory-approaches/#:~:text=There%20are%20also%20variations%20in,have%20a%20social%20sustainability%20taxonomy>> accessed 25 November 2024; J. P. Morgan Asset Management, 'The UK Sustainability Disclosure Requirements (UK SDR) explained' (Sustainable Investing, October 2024) <<https://am.jpmorgan.com/gb/en/asset-management/adv/investment-themes/sustainable-investing/uk-sdr-explained/>> accessed 25 November 2024.

¹⁴⁸ FCA, 'Sustainability Disclosure Requirements (SDR) and investment labels.' (Policy Statement 2023) PS23/16.

¹⁴⁹ FCA, 'ESG 4.1 Sustainability labels.' (FCA Handbook, 02 October 2024) <<https://www.handbook.fca.org.uk/handbook/ESG/4/?date=2024-10-02§ion=esg%204.1&view=instrument>> accessed 26 November 2024.

¹⁵⁰ See paragraph 1.4 for more information on the SFDR.

¹⁵¹ Further information on the SFDR implementation characteristics can be found in paragraph 1.4 of this chapter.

requirements entered into force on 2 December 2024 (with limited temporary flexibility, till 2 April 2025). The UK regime of Taxonomy alignment is still under definition¹⁵² for the UK.

The UK SDR includes detailed rules on specific product-level disclosures and entity-level sustainability reports, which make the SDR comparable to EU's SFDR, although not mandating for specific disclosure templates and introducing two levels of disclosure (consumer vs. institutional), which different disclosure regime at product and entity level, achieving the same regime of SDR. It also differentiates from SFDR by not including the notion of double materiality and Do No Significant Harm (DNSH) principle, as well as definitions, such as sustainable factors and investments. Under the UK SDR, firms shall disclose "any material negative environmental and/or social impacts", which broadly compared to the "principal adverse impacts" (PAI) disclosure under the SFDR framework, although not specific indicators are mandating to fulfil this obligation. While SDR has a clear, specific, and measurable sustainability objective,¹⁵³ on the other hand, the EU's SFDR identifies three financial product categories, each with a different transparency obligation -- and green scope.

Further disclosure requirements have been recently proposed for the SDR, in April 2024, with the Consultation Paper,¹⁵⁴ with which the Financial Conduct Authority planned to extend the Sustainability Disclosure Requirements and investment labels regime to portfolio management services to apply the labelling regime, naming and marketing rules, and disclosure requirements to portfolio managers by updating the Consultation Paper (CP22/20) and corresponding Policy Statement (PS23/16) on SDR and investment labels. As for the SFDR, SDR include product disclosure, but separated in three categories, i) product customer-facing disclosure, ii) pre contractual disclosure iii) on going disclosure: i) both labelled and unlabelled products must include a concise, consumer-friendly disclosure using sustainability-related terms of max of two pages, to be updated annually on progress. Distributors must ensure these disclosures are accessible and current. Furthermore, for international products using sustainability terms, a disclaimer that the product is not under UK SDR must be included ii) products using sustainability-related

¹⁵² HM Government, 'Sustainability Disclosure Requirements: Implementation Update 2024' point 1.17; see the following paragraph for more information on the UK Taxonomy

¹⁵³ 'a statement of intention to undertake activities with the aim of directly or indirectly improving or pursuing positive environmental and/or social outcomes.' FCA, 'Sustainability disclosure and labelling regime' (FCA, 01 November 2024) <<https://www.fca.org.uk/firms/climate-change-and-sustainable-finance/sustainability-disclosure-and-labelling-regime> > accessed 26 November 2024.

¹⁵⁴ FCA, 'Extending the Sustainability Disclosure Requirements (SDR) regime to Portfolio Management.' (Consultation Paper 2024) CP24/8**1.1.

terms, whether labelled or unlabelled, must include sustainability information in pre contractual disclosure, but annual updates are not required, which must be annual in the case iii). Entity level disclosure has been included in SDR starting 2 December 2025, for firms managing over £50 billion, to publish a report annually explaining sustainability risks and opportunities are addressed, regardless of labels or terminology. Smaller firms will follow in 2026.

The SDR also includes a new anti-greenwashing rule,¹⁵⁵ which reads in the UK greenwashing guidelines¹⁵⁶ to clarify to firms that sustainability-related claims about their products and services must be fair, clear and not misleading. As part of the Sustainability Disclosure requirement the new FCA Anti-Greenwashing Rule (“AGR”)¹⁵⁷ come into force in July 2024. This to formalise sustainability-related expectations, although further measures are still pending for disclosures, sustainability linked fund names and marketing. Compared to the UK regime, the EU financial sector does not have a dedicated anti-greenwashing rule. From the EU perspective, ‘anti-greenwashing has been an integral part of financial services policies, but lack of a harmonised official definition and legal classification of greenwashing violations; national regimes for marketing of investment products and civil liability; fragmentation of rules among different legislative acts (PR, MiFID II, UCITS/AIFMD, etc.); variety of forms, actors and means of greenwashing’.¹⁵⁸ Furthermore, a UK Sustainability Reporting Standards (“SRSs”) aligned to the IFRS’s International Sustainability Standards Board (“ISSB”) will become part of the UK SDR regime reporting standards by Q1 2025.

1.5.1.1 The UK Taxonomy

The UK to develop its own green taxonomy, established the Green Technical Advisory Group (GTAC) with the Green Finance Institute as a co-chair, to which also the International Regulatory Strategy Group (IRSG),¹⁵⁹ offered support to evaluate the technical screening criteria to ensure their relevance to the UK. The IRSG supported the short term need to urgently build a transitory

¹⁵⁵ Which came into effect on 31 May 2024.

¹⁵⁶ FCA, ‘Finalised non-handbook guidance on the anti-greenwashing rule.’ (Finalised guideline 2024) FG24/3 1.4.

¹⁵⁷ FCA, ‘Finalised non-handbook guidance on the anti-greenwashing rule’ FG24/3.

¹⁵⁸ Eugenia Macchiavello, ‘“Greenwashing” in investment intermediation: investor protection and the difficult role of enforcement’ (2024) University of Genoa EUSFiL Law Research Working Paper Series No. 28, 20 <<https://ssrn.com/abstract=4957242>> accessed 24 October 2024.

¹⁵⁹ International Regulatory Strategy Group, ‘Recommendations for reviewing the EU Taxonomy for UK application’ (IRSG, 28 May 2021) <<https://www.irsg.co.uk/publications/irsg-recommendations-for-reviewing-the-eu-taxonomy-for-uk-application/>> accessed 25 November 2024.

taxonomy, from the EU Taxonomy with an approach ‘adopt some and revise some’ as recommended by the GTAG.¹⁶⁰ The Government recently reiterated its interests¹⁶¹ in the 2023 Green Finance Strategy for a Taxonomy with the priority focus on investors and financial market participants, as well as their regulators. Also, because many UK financial market participants are also subject to the EU framework, then limit divergence and market fragmentation a close alignment with the EU Taxonomy is forecasted. However, the GTAC recommends the alignment with the EU together with a ‘grandfathering’ clause, to provide green bond issuers for current green bonds already taxonomy aligned to be considered green towards maturity also if the updated criteria may change.¹⁶²

The Greening Finance Roadmap¹⁶³ confirmed that the UK Green Taxonomy will apply to corporates, assets owners and managers, as well as investment products, and Taxonomy reporting will form part of the UK’s SDR implementation. This to create clarity and comparability of environmental performance and impact of companies and investment funds, to inform investors in their financial decisions; also, to improve understanding of companies’ contribution to environmental sustainability; and provide a reference point for companies’ performance.¹⁶⁴ As for the above, the current stage of the UK Taxonomy is not providing the technical criteria as for the EU Taxonomies¹⁶⁵. Then, since the Taxonomy framework (Taxonomy Regulation 2020/852/EU) has been included in the UK regulation, and the political willingness, as above explained, is to absorb EU technical criteria, the hypothesis of this research result correctly contextualised. As a matter of fact, this research structure and results further sustain the possibilities of implementation of the taxonomy scientific criteria in the UK, because demonstrated the preferences of the respondents for the Taxonomy described activities more than the Taxonomy objectives’ definitions¹⁶⁶.

¹⁶⁰ GTAG, ‘GTAG: Advice on the development of a UK Green Taxonomy’ (*Green Finance Institute*, October 2022) <<https://www.greenfinanceinstitute.com/wp-content/uploads/2024/06/GTAG-Advice-on-the-development-of-a-UK-Green-Taxonomy.pdf>> accessed 25 November 2024.

¹⁶¹ HM Government, ‘Sustainability Disclosure Requirements: Implementation Update 2024’ (2024).

¹⁶² GTAG, ‘Treatment of green financial products under an evolving UK Green Taxonomy’ (*Green Finance Institute*, September 2023) <<https://www.greenfinanceinstitute.com/wp-content/uploads/2024/06/GTAG-Final-Report-on-Treatment-of-Green-Financial-Products-Over-Time.pdf>> accessed 25 November 2024.

¹⁶³ HM Government, ‘Greening Finance: A Roadmap to Sustainable Investing’ (*Gov UK*, 2021) <<https://www.gov.uk/government/publications/greening-finance-a-roadmap-to-sustainable-investing>> accessed 25 November 2024.

¹⁶⁴ GTAG, ‘GTAG: Advice on the development of a UK Green Taxonomy’ *Green Finance Institute* (2022) 4, 19.

¹⁶⁵ ‘Climate Taxonomy’ and ‘Environmental Taxonomy’.

¹⁶⁶ See paragraph 3.4.2 of final questionnaire questions description discussion.

1.6 SUSTAINABILITY PREFERENCES AND ITS LEGAL FRAMEWORK

The Taxonomy is also an applied criteria to label sustainability preferences for green investments as defined by article 2(7)¹⁶⁷ of Delegated Regulation (EU) 565/2017, which shall identify clients' choice for a sustainable financial instrument to be integrated in their investment.

Retail investors' demand of financial instruments with sustainability features are also related to the availability of products its selves, which seems limited to investors¹⁶⁸. Each instruments undergo a target market assessment by manufacturers and distributors to specify the compatibility with sustainability-related objectives to ensure that a product is distributed in accordance with the actual target market. Manufacturers define potential target market, to which distribution shall be compatible, through criteria that identify type of clients, their knowledge and experience, financial situation, risk tolerance and compatibility with risk/reward of product, objectives and needs. However, the nature of the product shall be duly considered for products characterised by complexity/risk features or by other relevant features, in particular¹⁶⁹. A distributor who has detailed information on the client¹⁷⁰, can narrow the potential market in actual target market and negative target market on which exemptions can be justified on individual basis with report to the manufacturer. Nevertheless, the analysis of the target market within product governance arrangements is separate from, and does not substitute, the suitability or appropriateness assessments.

These assessments are conduct of business rules applied to each specific transaction undertaken by an investor for a particular product¹⁷¹, as investment

¹⁶⁷ "CDR 1253/2021, article 1 (1) sustainability preferences:" mean a client's or potential client's choice as to whether and, if so, to what extent, one or more of the following financial instruments shall be integrated into his or her investment:

(a) a financial instrument for which the client or potential client determines that a minimum proportion shall be invested in environmentally sustainable investments as defined in Article 2, point (1), of Regulation 2020/852/EU.

(b) a financial instrument for which the client or potential client determines that a minimum proportion shall be invested in sustainable investments as defined in Article 2, point (17), of Regulation 2019/2088/EU.

(c) a financial instrument that considers principal adverse impacts on sustainability factors where qualitative or quantitative elements demonstrating that considerations are determined by the client or potential client"

¹⁶⁸ European Securities and Market Authority, 'Call for evidence on the integration of sustainability preferences in the suitability assessment and product governance arrangements' (ESMA 2023) 35-43-3599.

¹⁶⁹ European Securities and Market Authority, 'Guidelines on MiFID II product governance requirements' (ESMA 2018) 35-43-620.

¹⁷⁰ These cases can justify smarter defaults, when the use of extra financial information guide the client to a better choice that the one the client itself would have done without the specialist advice. See paragraph on Green Default 3.5.1.

¹⁷¹ Veerle Colaert, 'European banking, securities, and insurance law: Cutting through sectoral lines?' (2015) 52 (6) Common Market Law Review 1579.; and Danny Bush, 'Product Governance and Product Intervention

firms must actively assess the suitability or appropriateness of financial instruments for a particular investor (“know-your-client” and know your product¹⁷²). Financial institutions who provide services other than investment advice or portfolio management, are required to assess client’s appropriateness by evaluating client’s knowledge and experience regarding the specific financial instrument they intend to invest in- identifying the investment risks the client is able to understand- with the purpose to act in the client’s best interest. This assessment must be based on reliable information, and firms should implement safeguards to prevent clients from adapting their experience to the instrument they want to buy. The firm must obtain information on the type of financial service and instrument, the nature, volume and frequency transaction in regulated financial instruments the client is familiar with and its level of education, profession or former profession of the client. If a financial organization determines that a service or product is not appropriate must warn the client. The client then decides whether to proceed or not with the purchase¹⁷³.

While financial organizations offering investment advice or asset management must assess suitability, which includes collecting information, evaluating the client’s knowledge, experience, financial situation -including the ability to bear losses-, investment goals including risk tolerance to assess if a given investment instrument is suitable for her also based on firm understanding of the products they recommend or invest in on behalf of clients. Recommendations collected in the suitability report should align with the gathered information

under MiFID II/MiFIR’ (2017) in Danny Busch and Guido Ferrarini eds. *Regulation of the EU Financial Markets. MiFID II and MiFIR*, Radboud Univesiteit, 123, 5.40

¹⁷² Articles 16(2) and 25(2) ‘MiFID II’, and Articles 54(2) to 54(5) and Article 55 ‘MiFID II Delegated Regulation’. and I.II Guidelines on certain aspects of the MiFID II suitability requirements’ (ESMA 2018) 35-43-1163,7.

¹⁷³ European Securities and Market Authority, ‘Guidelines on certain aspects of the MiFID II appropriateness and execution-only requirements’ (ESMA 2022) 35-43-2938, 14. ESMA considers that appropriateness should include the following:

- Explanation that the firm is responsible for conducting the assessment. And a reminder that client’s accurate responses are essential for a reliable assessment.
- Information on situations where no assessment will be conducted. A brief explanation of the differences between advised and non-advised investment services.

For ongoing client relationships, firms do not need to provide this information before each non-advised service.

1.6.1 The suitability assessment

The implementation of the suitability assessment includes a three-stage process:

1. data collection¹⁷⁴ of client's essential facts, which is meant to obtain information about the client's knowledge and experience in the investment field, their ability to bear losses, and objectives including the client's risk tolerance. This to understand risk preferences and tolerance and define accordingly (a) investment aims, which objectives and length must correspond to client's ones, (b) financial situation, for the client to subscribe an investment which do not place the client in unbearable risk positions and (c) investment experience and knowledge, to involve the client in risks is able to understand, give his level of experience and knowledge. Within the collected information for the suitability assessment different elements are included, such as example, client's ability to understand the mechanisms which make the investment product "complex"¹⁷⁵ and the non-financial elements such client's preferences on environmental, social and governance factors.¹⁷⁶
2. product assessment¹⁷⁷ and adequate selection of it, is the procedure meant to enable the firm to provide services and products that are suitable for the client (target market). This to meet the already identified clients' investment objectives, financial situation, and investment knowledge and experience by offering the adequate financial instrument.
3. the client by explaining how the selected financial service is suitable to the client as for point 1 of the assessment. Art 109 (c)¹⁷⁸ ensured that client's records are kept, including the suitability reports provided to clients, accessible to relevant persons in the firm, and to competent authorities. The importance of the full disclosure in the suitability report about the offered financial instrument has been also highlighted during ESMA consultations¹⁷⁹ in consideration that the client can adapt his

¹⁷⁴ Article 54(2) 'CDR 565/2017'.

¹⁷⁵ European Securities and Market Authority, 'Guidelines on certain aspects of the MiFID II suitability requirements' (ESMA, 2018) 35-43-1163 Article 27.

¹⁷⁶ European Securities and Market Authority, 'Guidelines on certain aspects of the MiFID II suitability requirements' (ESMA, 2018) 35-43-1163 Article 28.

¹⁷⁷ Article 54(9) 'CDR 565/2017'.

¹⁷⁸ European Securities and Market Authority, 'Final Report Guidelines on certain aspects of the MiFID II suitability requirements' (ESMA 2022) 35-43-317 Annex 4 page 68.

¹⁷⁹ European Securities and Market Authority, 'Final Report Guidelines on certain aspects of the MiFID II suitability requirements' (ESMA 2022) 35-43-3172 Annex 4 page 42, and articles 14 and 15.

sustainability preferences, but the adaptation should refer, and being documented, to a specific investment advice without re-profiling.

In fact, to ensure that sustainability preferences are considered in the suitability assessment two measures have then been promulgated: a level 2 legislative proposal measure such as the amendment of MiFID II delegated acts, and a subsequent non-legislative measure of inviting the European Securities Markets Authority (ESMA) to update its guidelines on the suitability assessment to include provisions on sustainability preferences¹⁸⁰.

ESMA's mission to enhance investor protection must include the observed trend of investor preferences interested in financial products that incorporate environmental, social and governance (ESG) factors. In the ESMA Sustainable Finance Roadmap the challenge of the current sustainable finance context in the EU was identified as the "increasing risk of misalignment between investors' ESG preferences and products being offered to them, partly due to limited financial education on ESG-investing and lack of expertise on ESG matters by actors in the investment value chain, notably financial advisors".¹⁸¹ Although, ESG preferences are among the impacts to be included while prioritising investment actions, under ESMA's investment services, there is only a general reference to a contribution "to the EC's work on the Markets in Financial Instruments Directive II (MiFID II) changes to enable financial market participants and advisers to systematically consider positive and negative sustainability impacts of the products they advise on and of their investment decisions."¹⁸²

1.6.2 Definitions

A primary definition of sustainability preferences is elaborated in 2021 to be included in MiFID II¹⁸³, and reads "client's or potential client's choice as to whether and, if so, to what extent, one or more of the following financial instruments shall be integrated into his or her investment". Further elaboration

¹⁸⁰ See paragraph 1.6.5 for more information on sustainability preferences impact due to level 1 and 2 norms application.

¹⁸¹ European Securities and Market Authority, 'Sustainable Finance Roadmap 2022-2024' (ESMA 2022) 30-379-10517.

¹⁸² European Securities and Market Authority, 'Sustainable Finance Roadmap 2022-2024.' n.1 page 27, priority 1.

¹⁸³ Commission Delegated Regulation (EU) 1253/2021 of 21 April 2021 amending Delegated Regulation 565/2017 as regards the integration of sustainability factors, risks and preferences into certain organisational requirements and operating conditions for investment firms [2021] OJ L277/1, article 1(1).

of this definition follows because of the amendment of SFDR¹⁸⁴, which simplifies the pre-contractual and periodic disclosure templates for financial products and PAIs and provides other technical adjustments - including the specification of indexes of calculation of sustainable investments-. Furthermore, the approved ESAs amendments for financial product classification, added more clarity on the distinction of the two objectives (article 8 and 9) and their relations with the Taxonomy for the provisions of financial products with underlying ESG and sustainable investment options. Although article 2(7)¹⁸⁵ definition has been written for additional disclosure requirements with reference to investment funds and not for shares acquisition, which made the implementation of these criteria ambiguous¹⁸⁶.

Three kinds of financial instrument categories are identified¹⁸⁷:

- 1) environmentally sustainable investments as defined by the Taxonomy;¹⁸⁸
- 2) sustainable investments as defined by the SFDR¹⁸⁹; and
- 3) financial instruments which consider the potential negative effects on sustainability factors.

Taxonomy aligned investments (1) can be considered the greener investment option to be chosen by investors because related to a subset of clearly identified criteria specifically recognised as green by the taxonomy legislation.

The second category of instruments (2), instead, while referring to the SFDR did not offer a clear explanation on the greening shade of investments. In fact, the definition included both dark and light green investments as for article 9 and 8 of the SFDR respectively¹⁹⁰. However, environmental or social characteristics branded light green investments under article 8, disclosure of good governance can now be disclosed as aligned with the taxonomy point 3 c)

¹⁸⁴ See paragraph 1.4 of SFDR.

¹⁸⁵ Commission Delegated Regulation (EU) 565/2017.

¹⁸⁶ Matteo Gargantini, 'The New Role of Sustainability Preferences in the Regulation of Investment Services in Eugenia Macchiavello and Michele Siri (eds) *Sustainable Finance and Financial Education: A snapshot* (eBook, Giappichelli, 2024).

¹⁸⁷ 2 (7)– (9) MiFID Delegated Regulation (EU) 2017/565; Art. 1 (5) (6) MiFID Delegated Directive (EU) 2017/593.

¹⁸⁸ Article 2(1), 'Taxonomy'. See paragraph 5 of this chapter for investment in environmentally sustainable economic activities definition.

¹⁸⁹ Article 2(17), 'SFDR'.

¹⁹⁰ Article 8'SFDR': "financial product[which] promotes, among other characteristics, environmental or social characteristics, or a combination of those characteristics, provided that the companies in which the investments are made follow good governance practices"; Article 9 'SFDR': "a financial product has sustainable investment as its objective and an index has been designated as a reference benchmark".

meeting minimum standards for human rights and labour standards¹⁹¹, making this category partially overlapping with the previous one. As well as, for funds with sustainable investments as their goal - which by investing in companies that aim to contribute to a more sustainable society produce investments to be considered dark green as for article 9- the introduction of the disclosure of the decarbonisation targets of financial products and how sustainable investments “do not cause significant harm” (DNSH)¹⁹². If article 9 investments can be included in category 1, then differences of category 1 and 2 of investments is that financial products with sustainable investment objectives ensure a specific level of sustainability, while those promoting environmental or social characteristics do not guarantee such outcomes¹⁹³.

A third category of instruments (3) of products that considers Principal Adverse Impacts (PAI)¹⁹⁴, includes financial instruments, which the aim of reducing the negative environmental impact, address social consequences and working conditions of business activities, and protect human rights associated with the funded projects¹⁹⁵. The ESAs RTS also propose to simplify the framework for the disclosure of the main negative impacts (PAI) of investment decisions on the environment and society¹⁹⁶.

1.6.3 Sustainability preferences assessment

This research, to assess sustainability preferences, chose to use the climate taxonomy criteria as description because of the clear relationship between the realisation of climate neutrality - that legislation promoted as the overarching objective of the green deal - and its implementation through mitigation and adaptation investments as identified by the climate taxonomy. Then, with the following adoption of the environmental taxonomy, the research enlarged its descriptions to also include the four environmental objectives in the sustainability preferences evaluation. Although, this was adding to the

¹⁹¹ Article 3 ‘Taxonomy’, See paragraph 1.5 on the Taxonomy for more information.

¹⁹² See paragraph 1.4 on SFDR for more information on Article 9 disclosure obligations at product and entity level.

¹⁹³ Veerle Colaert, ‘Integrating Sustainable Finance into the MiFID II and IDD Investor Protection Framework’ in Kern Alexander, Matteo Gargantini and Michele Siri (eds), *The Cambridge Handbook of EU Sustainable Finance. Regulation, Supervision and Governance* (Cambridge University Press, forthcoming 2025).

¹⁹⁴ See paragraph 1.4 of this chapter for more information on PAIs.

¹⁹⁵ Point 18 and 20 ‘SFDR’ and article 2(24) ‘SFDR’ and point 10, Commission Delegated Regulation (EU) 1288/2022. How disclosure obligations and reporting on how the main negative impacts (PAI) of investment decisions on sustainability factors are integrated in all aspect of the product are further described in paragraph 1.4 of SFDR.

¹⁹⁶ See previous paragraph 1.4 for more information on ESAs RTS.

sustainability preferences evaluation an efficacy flaw due to the fact that environmental objectives are not clearly devoted to achieving climate neutrality - as explained in the taxonomy paragraph above- and that climate finance flows and metrics are a well-established practice for which several instruments are available and convalidated, while sustainable finance procedures are still in progress.¹⁹⁷ An example of the weakness of using the environmental taxonomy, it is that the clear targets in term of Turnover, Capex and Opex used to measure the fraction of investments in environmentally sustainable economic activities, are not effectively supported by the evaluation of the environmental performance of these financial flows.¹⁹⁸ Furthermore, not every activity included in the Taxonomy is highly sustainable, such as an example the forestry sector does not exclude unsustainable logging, while the agriculture sector is missing.¹⁹⁹

1.6.4 Sustainability preferences evaluation

The same article 2(7)²⁰⁰ required the client to establish "a minimum proportion" for investment. Although, there is a straightforward calculation when share of funds are calculated,²⁰¹ evaluating this proportion can pose challenges in the context of a private portfolio. Then is the client, who must state in which proportion its sustainability preferences²⁰² for a financial instrument must be invested in the three different categories of environmentally sustainable investments (from the Taxonomy),²⁰³ sustainable investment (from the SFDR),²⁰⁴ and investments with adverse impacts on sustainability factors (PAI)²⁰⁵. The appropriate legal tool to supply sustainable finance products, and define their amount, was identified in the suitability assessment as amended by the Commission Delegated Regulation (EU) 1253/2021 which meant to

¹⁹⁷ Sebastian Steuer and Tobias Tröger, 'The role of disclosure in green finance' (2022) 8(1) Journal of Financial Regulation 1.

¹⁹⁸ Paola D'Orazio, 'Towards a post-pandemic policy framework to manage climate-related financial risks and resilience' (2021) 21(10) Climate Policy 1368.

¹⁹⁹ Mathilde Crépy, 'EU climate taxonomy: the good, the bad, and the ugly' (*Ecos*, 5 May 2021) <https://ecostandard.org/news_events/good-bad-ugly-taxonomy/> accessed 27 April 2023.

²⁰⁰ Commission Delegated Regulation (EU) 565/2017.

²⁰¹ 'The weighted aggregation of financial instruments, each with its own level of sustainability, within funds' units will determine the proportion of the sustainable investments within the unit.' Matteo Gargantini, 'The New Role of Sustainability Preferences in the Regulation of Investment Services in Eugenia Macchiavello and Michele Siri (eds) *Sustainable Finance and Financial Education: A snapshot* (eBook, Giappichelli, 2024)' 8; sustainability preferences description is included in footnote 168.

²⁰² This research then also assesses preference evaluation. For more results on sustainability preferences evaluation calculation see paragraph 3.2.1 and 3.4.1.1 chapter III.

²⁰³ Article 2(1), 'Taxonomy'.

²⁰⁴ Article 2(17), 'SFDR'.

²⁰⁵ Article 4 Commission Delegated Regulation (EU) 1288/2022.

meet the suitability requirement obligations set out in Article 25(2) of MiFID II and Articles 54 and 55 of the MiFID II Delegated Regulation. In fact, as part of the suitability assessment, investment advisers shall obtain information not only about clients' investment knowledge and experience, ability to bear losses, and risk tolerance but also about their sustainability preferences, for which for example, firms could use questionnaires (also in a digital format).²⁰⁶

1.6.5 Investment firms' assessment compliance

According to Article 54 of the MiFID II Delegated Regulation, firms are required to collect clients' sustainability preferences to consider it as part of the clients' suitability assessment²⁰⁷. The Commission by introducing sustainability preferences through a level 2 norm (Delegated Regulation (EU) 565/2017)²⁰⁸ and not level 1 (Directive 2014/65) supported the fact that sustainability preferences evaluation is not an additional regulatory obligation but legally is part of the same three suitability risk variables²⁰⁹ to be mapped. The integration of preferences within the investment objective, will allow the evaluation of the non-financial values of sustainability together with the financial variables, without making sustainability preferences eventually distorting client's risk profiling²¹⁰.

Another noteworthy aspect of the discussion is that the evaluation of ESG factors is considered a secondary step following financial risk assessment, as indicated in recital 8²¹¹. If the assessment of sustainability preferences did not result in the identification of suitable financial instruments, clients have the option to adjust their sustainability preferences downwards by investing in available financial instruments that were aligned with their financial risk profile.

²⁰⁶ European Securities and Market Authority, 'Final Report Guidelines on certain aspects of the MiFID II suitability requirements' (ESMA 2022) 35-43-3172.

²⁰⁷ See paragraph 1.6 for general description of suitability and appropriateness tests, and product governance and paragraph 1.6.1 for suitability assessment specifications.

²⁰⁸ To ensure that sustainability preferences are considered in the suitability assessment two measures have then been promulgated: a level 2 legislative proposal measure such as the amendment of MiFID II and IDD delegated acts, and a subsequent non-legislative measure of inviting the European Securities Markets Authority (ESMA) to update its guidelines on the suitability assessment to include provisions on sustainability preferences.

²⁰⁹ Such as client knowledge and expertise, investment objectives and the ability to bear losses, as for article 25(2) 'MiFID II', for further details on the suitability assessment see paragraph 1.6.1.

²¹⁰ Felix E. Mezzanotte, 'Accountability in EU Sustainable Finance: Linking the Client's Sustainability Preferences and the MiFID II Suitability Obligation' (2021) 16(4) Capital Markets Law Journal, 482 <<https://ssrn.com/abstract=3822367>> accessed 28 February 2023.

²¹¹ Commission Delegated Regulation (EU) 1253/2021.

As for the implementation of action four of the action plan²¹² this is part of the appropriate arrangements investment advisory and portfolio management have to make for the inclusion of sustainability factors by also avoiding mis-selling and misrepresentation of financial instruments to fulfil sustainability preferences²¹³. The essential distinction between investment goals and sustainability preferences is preventing mis-selling, which could occur if sustainability factors override a client's individual investment objectives, as clients should have the possibility to adapt his or her sustainability preferences²¹⁴. Furthermore, to prevent misrepresentations, investment firms offering investment advice should first evaluate a client's or potential client's broader investment objectives, time horizon, and individual circumstances before inquiring about their potential sustainability preferences²¹⁵. Also, ESMA recommends to firms to establish appropriate measures to ensure that incorporating ESG considerations into the suitability assessment does not result in mis-selling practices or conflict with the client's best interests by misrepresenting products to fulfilling ESG preferences²¹⁶. In fact, firms must clearly indicate what they consider to be ESG preferences, to allow the suitability assessment to also be consistent with the EU classification system (taxonomy) for ESG investments²¹⁷.

The correct identification and evaluation of investors' sustainability preferences within this legal framework, shall be one expected result of this research. More clarity on sustainability preferences should allow investors marking their needs and asking for a consistent financial instrument aligned with their sustainability preferences satisfaction. Financial institutions, on their side, shall satisfy their clients by providing the adequate sustainable financial instrument. In fact, firms are responsible of avoiding behaviour which limits their responsibility on proposing financial instruments which are only suitable

²¹² See paragraph 1.2 for more information on the Action Plan.

²¹³ Veerle Colaert, 'Integrating Sustainable Finance into the MiFID II and IDD Investor Protection Frameworks' (2022) KU Leuven, Jan Rose Institute for company & financial law 6/2020 19 <<https://tinyurl.com/7a6mbtbn>> accessed 28 June 2024.

²¹⁴ Commission Delegated Regulation (EU) 1253/2021 of 21 April 2021 amending Delegated Regulation (EU) 565/2017 as regards the integration of sustainability factors, risks and preferences into certain organisational requirements and operating conditions for investment firms [2021] OJ L 277/ 1 Recital 8.

²¹⁵ Commission Delegated Regulation (EU) 1253/2021 of 21 April 2021 amending Delegated Regulation (EU) 565/2017 as regards the integration of sustainability factors, risks and preferences into certain organisational requirements and operating conditions for investment firms [2021] C/2021/2616 OJ L 277/ 1 Recital 5.

²¹⁶ European Securities and Market Authority, 'Consultation Paper On integrating sustainability risks and factors in MiFID II'(ESMA 2018) 35-43-1210, Recital 17.

²¹⁷ European Securities and Market Authority, 'Consultation Paper On integrating sustainability risks and factors in MiFID II'(ESMA 2018) 35-43-1210, point 4.

to some risk profiles.²¹⁸ And, also while designing a suitability assessment questionnaire firms should consider the most common reasons for investors to answer questionnaires correctly.²¹⁹ Such as, avoiding misleading, technical language, framing and multiple answer to orient investors' choices and, as well as, ensuring that necessary information is collected. It follows that a suitable questionnaire for the correct evaluation of investor's sustainability preferences will both create investors knowledge, awareness, and better self-conscience of its own sustainability preferences facilitating the propagation of sustainability investments and sustainable financial instruments. This is also valid, in the case that an appropriateness test²²⁰ is required²²¹, as the instrument suggested to collect information for this test is a questionnaire as well²²².

Is currently under discussion²²³ the new Retail Investment Package²²⁴ with a proposal that also envisages the obligation to request and insert in the suitability assessment, information on the composition of the overall client portfolio, which can be limited to the evidence provided by the client. While for the suitability assessment performed by distributors for a range of 'diversified, noncomplex and cost-efficient financial instruments' clients' information will be restricted.

²¹⁸ European Securities and Market Authority, 'Final Report Guidelines on certain aspects of the MiFID II suitability requirements' (ESMA 2022) 35-43-3172 Articles 14 and 15.

²¹⁹ European Securities and Market Authority, 'Final Report Guidelines on certain aspects of the MiFID II suitability requirements' (ESMA 2022) 35-43-3172 Article 22 page 44.

²²⁰ European Securities and Market Authority, 'Guidelines on certain aspects of the MiFID II appropriateness and execution-only requirements' (ESMA 2022) 35-43-2938.

²²¹ The suitability test is compulsory only for investment advice and portfolio management, for most of the remaining ones is the case of appropriateness test see paragraph 1.6 for more information on this test.

²²² European Securities and Market Authority, 'Guidelines on certain aspects of the MiFID II suitability requirements' (ESMA 2022) 35-43-3172 Articles 20, 24, 25, 32.

²²³ Commission Proposal for a Regulation amending Regulation (EU) 1286/2014 as regards the modernisation of the key information document COM (2023) 278 final; and Commission Proposal for a Directive amending Directives (EC) 65/2009, (EC)138/2009, (EU) 61/2011, (EU) 65/2014 and (EU) 97/2016 as regards the Union retail investor protection rules. COM (2023) 279 final.

²²⁴ For this paragraph the author consulted: Council of the EU, 'Retail investment package: Council agrees on its position' (European Council of the European Union, 11 June 2024) <<https://www.consilium.europa.eu/en/press/press-releases/2024/06/12/retail-investment-package-council-agrees-on-its-position/>> accessed 28 June 2024; Francesco Moccia, 'Retail Investment Strategy, la strada è ancora lunga' (*Non Solo Diritto Bancario*, 14 May 2024) < <https://www.dirittobancario.it/art/retail-investment-strategy-la-strada-e-ancora-lunga/> > accessed 28 June 2024; Issam Hallak, 'Briefing EU legislation in Progress: Retail investor package' (*European Parliamentary Research Service*, 22 April 2024) <[https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/749795/EPRS_BRI\(2023\)749795_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/749795/EPRS_BRI(2023)749795_EN.pdf)> accessed 28 June 2024.

1.7 PRELIMINARY CONCLUSIONS

The EU legal regime by setting the assessment, evaluation and integration of sustainability preferences in the suitability assessment, allows investors to choose a suitable financial instrument also under their sustainability preferences. Then every investor has now the possibility to choose or accept (or not) a financial product leading to a green investment. The current legal framework raises the possibility of the involvement of every European citizen in the unique opportunity to become active player and transform Europe in the first carbon neutral continent. This because climate neutrality is now the core EU value as main objective of the European Green Deal (EGD)²²⁵ - in line with the EU's commitment to global climate action under the Paris Agreement – that is to make the EU a net-zero greenhouse gas emissions economy by 2050.

Based on the Action Plan for Sustainable Growth²²⁶, the green deal, by promoting a new development path of the economy needs an institutional set up fit for purpose, to stimulate and speed up the implementation of the climate neutrality objective. In turn, this requires a comprehensive adaptation of the European economic and financial framework to the goal of the green deal implementation plan, to also lead private investors to finance sustainable project and to consider sustainability consequences in their strategies and investment decisions. Also, through the support of the renewed EU sustainable finance strategy, which added further actions to the fundamentals of the action plan, for completion and implementation of the green deal investment plan.

The Taxonomy Regulation (EU)852/2020 and the following delegated acts²²⁷ are another important step of Action Plan implementation regarding sustainability preferences operationality. In fact, climate neutrality investments are identified through the selection of economic activities included in the climate taxonomy²²⁸, which details the criteria that qualify an economic action for mitigation and adaptation. Criteria to identify eligible and aligned environmentally sustainable economic activities are provided with the more recent environmental taxonomy²²⁹. Activities are taxonomy eligible if Revenues, CAPEXs and OPEXs of a company made a substantial contribution to at least one of the climate and environmental objectives. And they are also aligned if

²²⁵ The European Green Deal- see paragraph 1.3 for more information.

²²⁶ 'Action Plan Financing Sustainable Growth' see paragraph 1.2 for more information.

²²⁷ 'Taxonomy'; 'Climate Taxonomy'; 'Environmental Taxonomy'.

²²⁸ 'Climate Taxonomy' see paragraph 1.5 for more information.

²²⁹ 'Environmental Taxonomy', see paragraph 1.5 for more information.

doing no significant harm to the remaining objectives and meeting minimum standards on human rights and labour standards²³⁰.

Then, with the taxonomies implementation, investments in climate friendly environmental sectors - identified by the current six environmental objectives to which social and governance objectives will be added by future taxonomies - will be labelled as green, social sustainable investments. However, these flows being attributed to several green-identified sectors appear fragmented, putting aside the unique climate neutrality objective, because devoted to contributing to the overall sustainable finance framework of which measurability is still research at an ongoing stage²³¹. Although, the current climate taxonomy regulation covers only 13 sectors -with a limited number of listed activities²³² - such as 71 for climate change mitigation and 69 for climate change adaptation - those are responsible for almost over 80% of EU direct emissions²³³, but the number of companies' activities and investment portfolios aligned to the taxonomy in 2021 resulted low (between 1% and 5%, and many standing at zero)²³⁴. Then, although, enlarging targeted sectors by including the overall environment objectives will help in increasing impacts, it will probably reduce the efficacy of those impacts because missing the direct link within the environmental, social and governance impact and climate neutrality effects²³⁵. 2023 is the first reporting year of Taxonomy alignment KPIs for financial institutions and the second for non-financial companies. Reported Taxonomy-aligned Revenues across sectors has grown up 22% from €670bn(Y2022) to €814bn (2023), while green CapEx increased up 32% from €220bn to €291bn. Currently the activities under the Taxonomy Climate Delegated Act represent around 67% of GHG emissions in the European Union, mostly represented by utilities aligned Capex investments²³⁶.

²³⁰ European Commission, 'Eu Taxonomy Navigator' (*European Union*) <<https://ec.europa.eu/sustainable-finance-taxonomy/home>> accessed 29 June 2023.

²³¹ Paolo Canfora, Maria Arranz Padilla, Oliver Polidori, Nicolas Pickard Garcia, Suzana Ostojic and Marco Dri, *Development of the EU Sustainable Finance Taxonomy - A framework for defining substantial contribution for environmental objectives* 3-6. (European Union, 2022); Paolo Canfora, Marco Dri, Oliver Polidori, Clara Solzbacher and Maria Arranz Padilla, *Substantial contribution to climate change mitigation - a framework to define technical screening criteria for the EU taxonomy* (European Union, 2021).

²³² European Commission, 'EU taxonomy for sustainable activities' (*European Union*) <https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en> accessed 27 April 2023.

²³³ European Commission, 'EU taxonomy for sustainable activities, FAQ: What is the EU Taxonomy and how will it work in practice?' n.7 (*European Union*) < https://finance.ec.europa.eu/system/files/2021-04/sustainable-finance-taxonomy-faq_en.pdf> accessed 27 April 2023.

²³⁴ European Commission, 'EU taxonomy for sustainable activities, FAQ: What is the EU Taxonomy and how will it work in practice?' n.6.

²³⁵ Currently the 'Environmental Taxonomy' implementation reaches capital investments of a total of €440bn in 2023 and 2024 so far. European Commission, 'The EU Taxonomy's uptake on the ground'.

²³⁶ EU Platform on Sustainable Finance, 'Simplifying the EU Taxonomy to Foster Sustainable Finance Report on Usability and Data' (Europa EU| February 2025).

Also, the Sustainability Finance Disclosure Regulation (SFDR), the regulation originated to support the green deal implementation by introducing considerations of green and sustainability factors in the investment decision-making, is aligned with taxonomy criteria through the disclosure of adverse impacts of financial products on sustainability factors. Under the SFDR, firms must disclose to their client's relevant data about ESG risks and factors related to their organization and investment policies. However, definition and consequent identification of ESG investment products remain unclear creating confusion among investors. This issue compounds with the presence of multiple criteria combined with the complexity of technical standards related to green and social performances which are not designed as product labels or clear investment categories, making those irrelevant and useless²³⁷.

As an example, the ESAs' Regulatory Technical Standards (RTS)²³⁸ require compliance disclosures on the Do No Significant Harm (DNSH) principle for Article 9 products specifically targeting sustainable investments. The rationale behind this requirement is to ensure a more accurate assessment of impacts by aligning the DNSH disclosures under Article 2, point (17) of the SFDR with the minimum safeguards outlined in Article 18 of the Taxonomy Regulation. However, the Taxonomies Technical Screening Criteria (TSC)²³⁹ are predominantly qualitative (88% of DNSH criteria), and among the remain (12%), that are quantitative, 72% do not reference to any standards. This means that only 3% of the criteria rely on consistently collectible data to build an accurate assessment²⁴⁰.

Additionally, financial market participants must disclose the methodology used to assess sustainable investments. For example, if an Article 8 product promotes carbon emission reduction but does not have it as its primary objective - as required for Article 9- must ensure that disclosures across pre-contractual documents, websites, and periodic reports as well as marketing

²³⁷ David Ramos Muñoz, Marco Lamandini and Michele Siri, 'The Current Implementation of the Sustainability-related Financial Disclosures Regulation (SFDR)' (European Parliament, Luxembourg, 2024).

²³⁸ Commission Delegated Regulation (EU) 1288/2022 of 6 April 2022 supplementing Regulation (EU) 2019/2088 of the European Parliament and of the Council with regard to regulatory technical standards specifying the details of the content and presentation of the information in relation to the principle of 'do no significant harm', specifying the content, methodologies and presentation of information in relation to sustainability indicators and adverse sustainability impacts, and the content and presentation of the information in relation to the promotion of environmental or social characteristics and sustainable investment objectives in pre-contractual documents, on websites and in periodic reports [2022] OJ L 196/1.

²³⁹ 'Climate Taxonomy' and 'Environmental Taxonomy'.

²⁴⁰ EU Platform on Sustainable Finance, 'Simplifying the EU Taxonomy to Foster Sustainable Finance Report on Usability and Data' (Europa EU| February 2025) 37.

communications²⁴¹ do not mislead investors into believing that carbon emission reductions qualify a sustainable investment under Article 9(3).²⁴²

Further complexity arises from Delegated Regulation 1288/2022²⁴³ article 17(1), which details how to calculate the proportion of environmentally sustainable activities within a financial product. While it specifies that the numerator should include investments aligned with the Taxonomy, the denominator includes all investments of the financial product, valued at market value rather than net asset value. This approach can lead to potential inconsistencies—if liabilities are deducted and all assets are fully Taxonomy-aligned, the share of Taxonomy-aligned investments could exceed 100%, creating confusion about the actual level of sustainability.

These challenges make SFDR disclosures difficult to interpret not only for investors but also for financial market participants, advisors, and even National Competent Authorities (NCAs)²⁴⁴. The lack of standardized, actionable data and the complexity of reporting requirements hinder the ability of investors to align their decisions with their sustainability preferences.

To enable private retail investors to implement climate neutrality, through the application of the above regulations, their revealed preferences for decarbonisation shall be assessed. Investors must state their sustainability preferences for a financial instrument to be invested in minimum proportion in environmentally sustainable investments as defined by the Taxonomy²⁴⁵, or in sustainable investments as defined by SFDR²⁴⁶, or that considers principal adverse impacts on sustainability factors²⁴⁷, but currently not efficient standardisation measure are provided to enable investors to evaluate and compare financial instruments and then chose the most adequate. ESMA suggested an assessment of retail investors' perceptions, practices and

²⁴¹ Article 13 'SFDR'.

²⁴² ESAs Joint Committee, 'Consolidated Questions and Answers - Q&A - on the SFDR (Regulation (EU) 2019/2088) and the SFDR Delegated Regulation' (Commission Delegated Regulation (EU) 2022/1288) (JC 2023) 18, 36.

²⁴³ Commission Delegated Regulation (EU) 1288/2022 of 6 April 2022 supplementing Regulation (EU) 2019/2088 of the European Parliament and of the Council with regard to regulatory technical standards specifying the details of the content and presentation of the information in relation to the principle of 'do no significant harm', specifying the content, methodologies and presentation of information in relation to sustainability indicators and adverse sustainability impacts, and the content and presentation of the information in relation to the promotion of environmental or social characteristics and sustainable investment objectives in pre-contractual documents, on websites and in periodic reports [2022] OJ L 196/1. Article 17(1).

²⁴⁴ European Commission, *Summary Report of the Open and Targeted Consultations on the SFDR assessment* (2023) 7.

²⁴⁵ Article 2(1) 'Taxonomy'.

²⁴⁶ Article 8,9 and 2(17) 'SFRD'.

²⁴⁷ Article 4 Commission Delegated Regulation (EU) 1288/2022.

knowledge regarding sustainable finance through the Eurobarometer survey²⁴⁸, which in its April 2023 version showed a very low financial literacy level across the EU²⁴⁹. In response, in May 2023, the Commission adopted a Retail Investment Strategy²⁵⁰ aimed at empowering retail investors to make investment decisions aligned with their needs and preferences. This to ensure investors are treated fairly and duly protected alongside promoting educational initiatives to enhance consumers' financial literacy concerning responsible investment²⁵¹.

Currently, the legal tool to select and source sustainable finance products to retail investors is the suitability assessment as amended by the Delegate Act (EU) 1253/2021²⁵². Investment advisers and portfolio managers through the suitability assessment shall obtain information not only to define the client risk profile – including investment knowledge and experience, ability to bear losses, and risk tolerance - but also to assess its sustainability preferences, using, for example, a questionnaire (also in a digital format)²⁵³. It has to be noticed that the Commission, introduced the sustainability preferences assessment through a level 2 norm (delegated regulation 565/2017) and not level 1 (directive 2014/65), this to integrate sustainability preferences evaluation not as an additional regulatory obligation but legally as part of the risk profile evaluation. Then the investment in available sustainable financial instruments aligned with the financial risk profile should be the outcome of the suitability assessment, as reported in the suitability report, although, the choice of a financial product is not the level of protection the EU reached for private investors protection with the general duty of financial institutions to act in the best interest of the client.

Despite the SFDR, the Taxonomies and their improvements, to establish a standardized framework for defining, classifying, and reporting on sustainable investments - by enhancing transparency, promoting informed investment

²⁴⁸ European Securities and Market Authority, 'Final Report on Greenwashing' (ESMA 2024) 36-287652198-2699 point 195.

²⁴⁹ 'Only 18% of EU citizens have a high level of financial literacy, 64% - a medium level, and the remaining 18% - a low level'. European Commission, 'Eurobarometer survey reveals low levels of financial literacy across the EU' (European Union Finance, 18 July 2023) <https://finance.ec.europa.eu/news/eurobarometer-survey-reveals-low-levels-financial-literacy-across-eu-2023-07-18_en> accessed 28 November 2024.

²⁵⁰ See paragraph 1 Introduction and 1.6.4 Investment firms' assessment compliance for more information on the Retail Investment Strategy for sustainability preferences assessment.

²⁵¹ European Commission, 'Eurobarometer survey' European commission 'Questions and answers on the Retail Investment Package' (European Union, 24 May 2023) <https://ec.europa.eu/commission/presscorner/detail/en/qanda_23_2869> accessed 29 November 2024.

²⁵² Article 1. See for more information footnotes 15,16,17 and 19.

²⁵³ European Securities and Market Authority, 'Final Report Guidelines on certain aspects of the MiFID II suitability requirements.'

decisions that account for sustainability risks and adverse impacts - to reduce information gaps and asymmetry between investors and financial market participants, challenges remain in accurately valuing sustainable financial instruments and aligning them with investors' sustainability preferences, which are not clearly identified. This mismatch creates uncertainty in selecting appropriate financial products as mandated by the suitability assessment. Thenceforth, the current legislation defining suitability assessment does not create an adequate client-oriented protection model, while research demonstrates that policies and regulatory or supervisory actions with targeted interventions designed according to behavioural insights can significantly enhance the efficiency and effectiveness of national consumer protection frameworks.²⁵⁴

The evolution of the regulatory landscape due to the integration of sustainability into financial markets, changed the role of authorities, who now need to be able to balance between promoting sustainability and ensuring legal certainty while providing clear guidance to market operators²⁵⁵. Guidance, creating a market that attract sustainable investments through proper financial practices and preventing market distortions²⁵⁶, can materialise in nudging individuals to change their behaviour consistently to green choices considered ideal by current legislation²⁵⁷. However, policies as behavioural solutions to behavioural problems are highly dependent on the availability and access to relevant and quality information, on information and options framing, complexity and incentives from the environment in which decisions take place. Then a policy must incorporate a behavioural economics perspective to examine how cognitive and emotional factors can influence investors' choices, helping to understand how they might adjust their behaviour and shift demand toward green investments. This to enable legislators to provide a green nudge, as a smarter default, to serve consumers' best interests. Two key characteristics are necessary to create a smarter default such i) avoiding the misapplication of a one-size-fits-all approach and ii) considering differences among investors, this by factoring in market knowledge. This approach

²⁵⁴ Anne-Françoise Lefevre and Michael Chapman, 'Behavioural economics and financial consumer protection' (2017) OECD Working Papers on Finance, Insurance and Private Pensions, 42 < <https://doi.org/10.1787/0c8685b2-en>> accessed 09 July 2024; see also paragraph 2.7-chapter II Conclusions.

²⁵⁵ Mirella Pellegrini, Antonio Davola, Nunzio Casalino and Peter Bednar, 'Striking a balance between profit, people welfare, and ecosystem health in the transition towards a sustainable financial system, (2021) in Francesco Capriglione – Rosa Maria Lastra – R. McCormick Christopher Paulus – L. Reichlin – M. Sakuramoto Eds. 10(2) Law and Economics Yearly Review 295

²⁵⁶ Such as an example greenwashing practices. Davola, 'Striking a balance between profit, people welfare, and ecosystem health in the transition towards a sustainable financial system' at paragraph 9, Macchiavello 'Greenwashing' at 29.

²⁵⁷ Such as promoting decarbonisation to reach carbon neutrality as from the green deal.

ensures clients are supported in making the most suitable choices for their needs²⁵⁸.

This research designed a questionnaire, in compliance with current legislation to be integrated in the MiFID II suitability assessment, for investors to choose Climate and Environmental Taxonomies aligned activities contributing to mitigation and adaptation to climate change, and the other four environmental objectives. The questionnaire is created as implementation model of a structured choice architectural framework, which wants to include pro environmental behaviours compliance in financial services and help legislators to structure nudges to guide investors choices towards green investments.

Next chapter describes how the questionnaire was built to include behavioural bias analysis and solutions through a conceptual framework which structures the choice architecture for investors protection according to legislation and behavioural economics rules and principles. While findings and limitations of the study are analysed and discussed in the third chapter through the analysis of empirical results calculated on responses to the disseminated questionnaire. This to elaborate implications and applications for theory to policy changes included in the last paragraph of the study for discussion.

1.7.1 Is the current legal framework concerning disclosure and suitability assessment, supporting sustainability preferences assessment implementation, adequate to contribute to the green deal carbon neutrality objective?

H1 Does the use of nudging in the suitability assessment, by improving investors' choice adequacy for green financial products, lead to a better level of private investors protection?

The EU complex disclosure framework, as above described, by covering multiple areas (classification, transparency for nonfinancial reporting, benchmarks etc.) together with the legal requirements for conduct, shall lead private investors choices for green investments. However, being the framework fragmented and incomplete, is partially missing the possibility to reach the full potential of sustainable finance (transition, climate, green finance etc.). Due to the biases mentioned above, financial market participants and investors lack a unified understanding of which financial instruments best align with investors' revealed preferences.

²⁵⁸ For more information on green default see paragraph 3.5.1.

To enhance its effectiveness as a tool for decarbonization and achieve the distinct goal of carbon neutrality, the promotion and adoption of green investments can be supported by behavioural economics techniques and principles. This research presents a choice architecture framework that integrate behavioural insights for financial services and implement behavioural bias mitigation strategies in the suitability assessment, making it a valuable tool for promoting green investments. The choice architecture guides policymakers in preparing a nudging mechanism for green investing. Specifically, a green default can serve as an implementation tool, leveraging individuals' strong support for decarbonization driven by the overarching goal of carbon neutrality promoted by the Green Deal. This approach offers both theoretical and practical solutions to uncover and apply individual sustainability preferences while enhancing client protection.

While the above question on the adequacy of the EU legal framework has been discussed in this chapter I and summarised in the conclusion paragraph number seven above, the related hypothesis will be tested through the conceptual framework for green investment choice architecture analysis described in the chapter II. Choice architecture implementation results are discussed on chapter III and possible solutions for green default implementation are recommended in the last paragraph policy and regulation implication discussion²⁵⁹.

²⁵⁹ See paragraph 3.5-chapter III Policy and regulation implications discussion and conclusions.

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CHAPTER 2



Investors' Green Decision Making

2 INVESTORS' GREEN DECISION MAKING

2.1 INTRODUCTION

The EU Green Deal, as implementation instrument of the Action Plan of Sustainable Growth²⁶⁰, has established a regulatory framework mandating all sectors to align their economic activities with the aim of achieving climate neutrality. In this context, the finance sector should play the crucial role of promoting environmentally friendly financing schemes and providing incentives to industries that embrace eco-conscious practices. To facilitate this shift in the market, the Commission has introduced disclosure tools. Such as, for private investors, in particular, the compulsory disclosure of investors' sustainability preferences that financial advisors and portfolio managers are required to assess together with financial risk preferences, through the suitability assessment. The suitability assessment²⁶¹ serves as the instrument to gauge investors' revealed sustainability preferences, allowing them to choose a suitable sustainable financial instrument as green investment. The effectiveness of disclosure lies in financial advisors and portfolio managers ability to guide investors toward sustainable investments. However, as of now, there is no dedicated instrument that aligns investments with the environmental objectives outlined in the EU Green Taxonomy²⁶².

Investors' sustainability preferences fulfilment consists in the identification of an adequate financial instrument also from a sustainability point of view within a range of financially suitable products identified by the financial institution, according to the client profile risk suitability, normally using a questionnaire. Therefore, investors are expected to consciously choose green investments if a dedicated assessment instrument leveraging on transparency and disclosure is in place. However, since pro-environment behaviours are disengaged from financial decisions²⁶³, there could also be a gap between intentions and consequent investment decisions. Even when investors are well advised and convinced of the benefits of a specific investment, their actual investment behaviour can present a different outcome²⁶⁴.

²⁶⁰ For more information on 'The European Green Deal' and 'The Action Plan Financing Sustainable Growth' see paragraph 1.3 and 1.2 of the previous chapter.

²⁶¹ For more detailed information on the Suitability assessment see paragraph 1.6.5 of Chapter I.

²⁶² For more detailed information on the Taxonomies see paragraph 1.5 of Chapter I.

²⁶³ Anders Anderson and David T. Robinson, 'Financial Literacy in the Age of Green Investment' (2021) 19(6) Swedish House of Finance Research 1 <<https://ssrn.com/abstract=3353534>> accessed 27 October 2024.

²⁶⁴ Herwig Pilaj, 'The Choice Architecture of Sustainable and Responsible Investment: Nudging Investors Toward Ethical Decision-Making' (2017) Journal of Business Ethics 743.

To understand how investors could adjust their behaviour and shift their demand toward green investments, the cognitive and emotional aspects affecting investors' choices has been included in this research by including the behavioural economics perspective when researching investors' decisions. In the following three paragraphs, the behavioural factors that influence investment decisions are identified to include behavioural bias mitigations in the questionnaire designed to assess investors' sustainability preferences. This through the contextualisation and analysis of critical biases that may impact investor behaviour, alongside with strategies to mitigate bias effects to be included in the conceptual model of the questionnaire. Questionnaire design, as the implementation instrument of the behavioural bias mitigation actions for green investments, is structured through variables associated with the taxonomy objectives and proxies for risk perception of climate investments to align the model with the legal framework of sustainable finance. Detailed description is included in paragraph five and a methodology of implementation in paragraph six. Some conclusions follow in paragraph seven, while Appendix I close the chapter by showing the complete questionnaire.

2.2 BEHAVIOURAL ECONOMICS AND FINANCE

Behavioural economics²⁶⁵ provides an alternative approach to decision making theory by realistically analysing rational decisions and choices of real people to explain their behaviours which seem unpredictable by a rational choice theory, because modelling people choices in an ideal world.

²⁶⁵ This paragraph uses knowledge from: Dan Ariely, *Predictably Irrational: The Hidden Forces that Shape Our Decisions*. (revised and expanded edition, Harper 2010) 348; Michelle Baddeley, *Behavioural Economics and Finance* (2nd ed. Routledge 2018); Gary S. Becker, *The economic approach to human behavior* (University of Chicago Press 1976); Philip Corr and Anke Plagnol, *Behavioral Economics: The Basics* (Routledge 2018); Orlando Gomes, 'Behavioral economics and finance: a selective review of models, methods and tools' (2023) 40(3) *Studies in Economics and Finance* 393; Daniel Kahneman and Amos Tversky, 'Choices, values, and frames' (1984) 39(4) *American Psychologist* 341; Angela C. Lyons and Josephine Kass-Hanna, 'Behavioral Economics and Financial Decision Making' (2021) <<https://ssrn.com/abstract=3887605>> accessed 24 October 2024; Michael G. Pollitt and Irina Shaorshadze, 'The Role of Behavioural Economics in Energy and Climate Policy' (2011) EPRG Working Paper 1130 and Cambridge Working Paper in Economics 1165 <<https://api.repository.cam.ac.uk/server/api/core/bitstreams/86c97041-4a94-4737-a253-32c5a41f71d8/content>> accessed 27 October 2024; Tiran Rothman 'Introduction to Behavioral Finance' 51 in Tiran Rothman (ed.) *Valuations of Early-Stage Companies and Disruptive Technologies* (Palgrave Macmillan 2020); Cass Sunstein, 'Feast Framework for Behavioral Change.' (On-line Conference on Experimental Insights from Behavioral Economics on COVID-19 sponsored by the Johns Hopkins Business of Health Initiative (HBHI) and the London School of Economics Department of Psychological and Behavioural Science (PBS), London 2021) <<https://www.youtube.com/watch?v=MiuoQ23h9So>> accessed 24 October 2024; Francesca Gino, 'The rise of behavioral economics and its influence on organizations.' (*Harvard Business Review*, 10 October 2017) <https://hbr.org/2017/10/the-rise-of-behavioral-economics-and-its-influence-on-organizations>> accessed 24 October 2024; Derek D. Reed, Christopher R. Niileksela and Brent A. Kaplan, 'Behavioral economics: a tutorial for behavior analysts in practice' (2013) 6(1) *Behavior Analysis in Practice* 34.

Behavioural economics—and the related field of behavioural finance, which emerged in 80s²⁶⁶- following empirical studies in the 70s, which by experimenting (on lab and field) people economic and financial decisions with a focus on psychological and sociological factors²⁶⁷, demonstrated that individuals often deviate from seeking their expected utility maximisation, making better and more socially responsible choices by not realising their preferences consistent across time and context independent, or by deciding quickly not calculating benefits and costs of decisions. Also, individuals make choices, which are not optimal despite accessing and assessing freely and completely all the available information, because relying on heuristics (mental shortcuts) and navigate complexity, by making systematic mistakes. Furthermore, people decisions are influenced by emotions, by own and other skills, and timing of rewarding. Decisions which can be analysed and explained by behavioural economics modelling.

Behavioural economics findings revolutionised economic theory and policy practice by suggesting interventions, in form of nudges, to gently push people toward favourable decision outcomes for themselves and society. A nudge is “any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid”.²⁶⁸ Nudges implementation ought to enhance welfare of individuals, by counteracting poor choices, through the application of policies based on a set of choices best for them in the long run. Policies appears as a behavioural solution to a behavioural problem, because nudge force individuals to change their behaviour consistently to choices considered ideal by experts. However, behavioural economics has not a unitary approach to economics, therefore, behavioural solutions are highly dependent on the availability and access to relevant and quality information, on information and options framing, complexity and incentives from the environment in which decisions take place.²⁶⁹

²⁶⁶ Behavioural finance explains people irrational financial decisions also suggesting that financial markets are not always efficient then failing on revealing economic fundamental mechanisms due to irrational behaviour.

²⁶⁷ in particular, Kahneman and Tversky (1979) explained through the prospect theory how people value gains and losses rather than the final outcome, while investing in financial assets, and Shefrin (2001) demonstrated the significance of psychological factors influencing investors' rational decision-making. Daniel Kahneman and Amos Tversky, 'Prospect theory: An analysis of decision under risk' (1979) 47(2) *Econometrica* 263 and Hersh Shefrin, 'Behavioral corporate finance' (2001) 14(3) *Journal of Applied Corporate Finance* 113.

²⁶⁸ Richard H. Thaler and Cass R. Sunstein, *Nudge: Improving decisions about health, wealth, and happiness* (Penguin 2008).

²⁶⁹ Morris Altman, 'Implications of behavioural economics for financial literacy and public policy' (2012) 41 (5) *The Journal of Socio-Economics* 677.

2.3 BEHAVIOURAL ECONOMIC INSIGHTS RELEVANT FOR FINANCIAL SERVICES

A range of behavioural economic causes²⁷⁰ have recently been identified for financial advice, investment and management, as source of bias influencing decision making by encouraging investors to deviate from rationality and make irrational investment decisions. These causes have been further analysed and refined through literature review, in this research, to identify the factors that influence more directly investors' decisions for green investments. The following two paragraphs describe first the identified factors, which are listed below together with the related literature review in details, then the rationale for behavioural mitigation bias to be implemented in the questionnaire, of which findings analysis and regulatory implications are discussed in chapter III.

2.3.1 Information system quality and information overload

Information can be symmetric, when everybody has and knows to have the same information, or asymmetric when some actors possess private information, or information that others do not have. A consequence of asymmetric information²⁷¹ is that informed investors due to their private information can trade advantageously in respect to uninformed investors, who only access public information. These advantages will cause a market failure, that requires government intervention to ensure that

²⁷⁰ Satish Kumar and Nisha Goyal, 'Behavioural biases in investment decision making – a systematic literature review' (2015) 7(1) *Qualitative Research in Financial Markets* 88; Kristine Erta, Stefan Hunt, Zanna Iscenko and Will Brambley, 'Applying behavioural economics at the Financial Conduct Authority' (2013) FCA Occasional Paper 1 <<https://www.fca.org.uk/publication/occasional-papers/occasional-paper-1.pdf>> accessed 05 July 2024; Barbara Alemanni, 'Sustainability and Investors' Behaviour,' in Eugenia Macchiavello and Michele Siri (eds) *Sustainable Finance and Financial Education: A snapshot* (Giappichelli ebook, 2024); Yuyang Wang, 'Behavioral Biases in Investment Decision-Making' (2nd International Conference on Financial Technology and Business Analysis, online 2023) <https://www.researchgate.net/publication/376131619_Behavioral_Biases_in_Investment_Decision-Making> accessed 25 October 2024; Yuan-Lin Hsu, 'Financial advice seeking and behavioral bias' (2022) 46 (B) *Finance Research Letters* 1; Craig R. Carter, Lutz Kaufmann and Alex Michel, 'Behavioural supply management: a taxonomy of judgment and decision-making biases' (2007) 37 (8) *International Journal of Physical Distribution and Logistics Management* 631.

²⁷¹ Richard W. Tresch, 'Introduction to Normative Public Sector Theory' in Richard W. Tresch (ed.) *Public Finance* (Third Edition, Academic Press 2015) 517; Stephen Brown and Stephen A. Hillegeist, 'How disclosure quality affects the level of information asymmetry' (2007) 12 *Rev Acc Stud* 443; Jane Sell and Rick K. Wilson, 'Levels of information and contributions to public goods' (1991) 70(1) *Social Forces* 107; Arthur Levitt, 'The importance of high-quality accounting standards' (1998) 12(1) *Accounting Horizons* 79

shareholders and investors can access information fairly and simultaneously. Information disclosure can also be voluntary, when the net outcome between cost of disclosure and benefits obtained is positive.

Disclosure quality, which also influences the level of information asymmetry, must result in comparability and transparency of data, enabling investors to analyse company's performance across time and companies. This to make capital markets more attractive and to protect unsophisticated investors by giving to investors greater confidence. Information quality is also essential for effective financial literacy,²⁷² which is the ability to process economic information and make informed decisions about financial planning.²⁷³

Also, the amount and kind of information to be provided is important: research findings²⁷⁴ suggest that, above a certain level, information can potentially become counterproductive, and information overload leads investors to ignore it because overwhelmed. Especially, regarding highly complex financial instruments investors might be unable to understand and accordingly use disclosed information because of "bounded rationality."²⁷⁵ On the other hand, investors capacities are also constrained by the fact that improving and assessing the readability of mandatory disclosures is also a complex task. Recent investors testing research has identified several useful factors to make information disclosure more effective, such as plain language, visual element support and contextual representation²⁷⁶.

To address the information asymmetry created by differing national regulations to improve investor protection and confidence the EU

²⁷² H. Kent Baker, Satish Kumar, Nisha Goyal and Vidhu Gaur, 'How financial literacy and demographic variables relate to behavioral biases' (2019) 45 (1) *Managerial Finance* 124 <<https://www.emerald.com/insight/content/doi/10.1108/MF-01-2018-0003/full/html#sec001>> accessed 20 October 2024.

²⁷³ Annamaria Lusardi and Olivia S. Mitchell, 'The Economic Importance of Financial Literacy: Theory and Evidence' (2014) 52 (1) *Journal of Economic Literature* 5.

²⁷⁴ Joost Impink, Mari Paananen and Annelies Renders, 'Regulation-induced Disclosures: Evidence of Information Overload?' (2022) 58(3) *Abacus* 432; Julie R. Agnew and Lisa R. Szykman, 'Asset allocation and information overload: The influence of information display, asset choice, and investor experience' (2005) 6 *The Journal of Behavioral Finance* 57.

²⁷⁵ The theory and process of decision-making suggest that individuals, who are typically rational, can generally be approximated to act in accordance with their preferences to maximize utility. However, with bounded rationality, rationality directs persons to make decisions that meet a specific criterion, without necessarily making the most optimal choice within that criterion due to limited information-processing capabilities. Herbert A. Simon, 'A Behavioral Model of Rational Choice' (1955) 69 (1) *The Quarterly Journal of Economics* 99.

²⁷⁶ Yuqi Nie, Yaxuan Kong, Xiaowen Dong, John M. Mulvey, H. Vincent Poor, Qingsong Wen and Stefan Zohren, 'A Survey of Large Language Models for Financial Applications: Progress, Prospects and Challenges.' (*Arxiv.org* 15 June 2024) <<https://arxiv.org/html/2406.11903v1#S6>> accessed 21 October 2024.

established uniform transparency rules with the Packaged Retail and Insurance-Based Investment Products (PRIIPs)²⁷⁷ Regulation applicable to all PRIIPs market participants. The European legislator specifically addressed pre-contractual documentation requirements for investment operations involving financial products classified as PRIIPs²⁷⁸ by mandating the Key Information Documents (KIDs)²⁷⁹ for PRIIPs.

Starting from 1 January 2023, the information documents, of KID and KIID²⁸⁰ as well as the information note of the prospectus²⁸¹, has been reviewed on some elements of the presentation and content according to the Regulatory Technical Standards (RTS) of the KIDs²⁸². One of the changes focus on greater clarity and transparency for the documentation to ensure that retail investors receive adequate information relating to the investment products they subscribe. However, financial product information remains complex also failing to satisfy the four genre-elements analysis such as characters, setting, plot and story to make the financial product information understandable²⁸³.

²⁷⁷ Council Regulation (EU) 1286/2014 of 26 November 2014 on key information documents for packaged retail and insurance-based investment products 'PRIIPs' [2014] OJ L 352/ 1.

²⁷⁸ PRIIPs are complex financial or financial-insurance products that are difficult to understand and inherently risky such as convertible bonds, derivative financial instruments, structured products and deposits, and instruments issued by special purpose vehicles. It also covers insurance products with an investment component, such as unit-linked policies. However, PRIIPs do not include products like stocks, sovereign bonds, supplementary pension products, or insurance policies that provide benefits only in case of death or severe damage.

²⁷⁹ Key Information Documents (KID); European Union, 'Key information documents for packaged retail and insurance-based investment products (PRIIPs)' (*European Commission*) <https://finance.ec.europa.eu/consumer-finance-and-payments/retail-financial-services/key-information-documents-packaged-retail-and-insurance-based-investment-products-priips_en> accessed 12 November 2024; Regulation (EU) 1286/2014 of 26 November 2014 on key information documents for packaged retail and insurance-based investment products (PRIIPs) [2014] OJ L 352/1.

²⁸⁰ Key Investor Information Document (KIID) is created to structure the provision of fund disclosures by the Undertakings for Collective Investment in Transferable Securities 'UCITS' IV Directive (2009/65/EC) and Commission Regulation 583/2010 replaced the simplified prospectus, which was considered ineffective due to inconsistent implementation across member states, excessive complexity, and overly technical language, offering little real benefit to investors, maintaining the same core objectives: providing retail investors with clearer, more accessible information and enabling easier product comparisons. 'UCITS'; Commission Regulation (EU) 583/2010 of 1 July 2010 implementing Directive 2009/65/EC as regards key investor information and conditions to be met when providing key investor information or the prospectus in a durable medium other than paper or by means of a website OJ L 176/1.

²⁸¹ Council Regulation (EU) 1129/2017 of 14 June 2017 on the prospectus to be published when securities are offered to the public or admitted to trading on a regulated market, and repealing Directive 2003/71/EC [2017] OJ L 168/12.

²⁸² ESAs Joint Committee, 'Draft Final Report following consultation on draft regulatory technical standards to amend the PRIIPs KID' (JC 2020) 66.

²⁸³ Christine V. Helliard, Braam Lowies, Ary Suryawathy, Robert B. Whait and Kurt Lushington, 'The genre of banking financial product information: The characters, the setting, the plot and the story' (2022) 54 (1) *The British Accounting Review*

A new prospective on information is given in the case of non-financial information for financial products²⁸⁴. As the complexity of sustainability often disadvantages stakeholders, who, due to insufficient data and information, may struggle to assess a firm's commitment to green, Environmental, Social and Governance (ESG) and sustainability objectives. Then, practices, although supporting the implementation of sustainable finance, can reduce comparability among companies and financial products increasing also the risk of “greenwashing”²⁸⁵, because impacting on the ability to identify companies that are really green then increasing investors’ scepticism. In this context, standards and labels²⁸⁶ can also support investors in making better informed choices. Because the introduction of clear indicators of sustainability improves the active management of sustainability information to be progressively integrated in the value of the financial products itself²⁸⁷, to also align those to values and environmental concerns of investment advisors and retail investors.

Furthermore, together with transparent access to information greater sustainable finance investments occurs because of investor financial sophistication²⁸⁸, which can be defined as the capacity to understand and respond to information. This can be acquired with specific educational

²⁸⁴ Claudia Guagliano, Nadia Linciano, and Paola Soccorso, 'Information as a Driver of Sustainable Finance.' in Nadia Linciano, Paola Soccorso and Claudia Guagliano (eds), *Information as a Driver of Sustainable Finance The European Regulatory Framework* (Palgrave Macmillan 2022); Riccardo Boffo and Robert Patalano 'Environmental, social and governance (ESG) investing 'in *OECD Business and Finance Outlook 2020: Sustainable and Resilient Finance*, (OECD 2020) chapter 1; Emma Boulstridge and Marylyn Carrigan, 'Do consumers really care about corporate responsibility? Highlighting the attitude-behaviour gap' (2000) 4 *Journal of Communication Management* 355.

²⁸⁵ Greenwashing with specific reference to greenwashing practices in the financial sector, has been defined as 'practice of misrepresenting sustainability-related information, practices or features throughout the investment value chain.' OICV- IOSCO, 'Good Sustainable Finance Practices For Financial Markets Voluntary Standard Setting Bodies and Industry Associations - Call For Action' (IOSCO, 7 November 2022) <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD717.pdf>, accessed 27 October 2024; for more information see Eugenia Macchiavello, "“Greenwashing” in investment intermediation: investor protection and the difficult role of enforcement" (2024) University of Genoa EUSFIL Law Research Working Paper Series No. 28 <<https://ssrn.com/abstract=4957242>> accessed 24 October 2024. Mirella Pellegrini, Antonio Davola, Nunzio Casalino and Peter Bednar, 'Striking a balance between profit, people welfare, and ecosystem health in the transition towards a sustainable financial system, (2021) in Francesco Capriglione – Rosa Maria Lastra – R. McCormick Christopher Paulus – L. Reichlin – M. Sakuramoto Eds. 10(2) *Law and Economics Yearly Review* 295

²⁸⁶ William Young, Kumju Hwang, Seonaidh McDonald and Caroline J. Oates, 'Sustainable Consumption: Green Consumer Behaviour when Purchasing Products' (2010)18 *Sustainable Development* 20; see also paragraph 2 chapter I for label and standards implementation in the legal framework of sustainable finance.

²⁸⁷ Claudia Guagliano, Nadia Linciano, and Paola Soccorso, 'Information as a Driver of Sustainable Finance' in Nadia Linciano, Paola Soccorso and Claudia Guagliano (eds), *Information as a Driver of Sustainable Finance the European Regulatory Framework* (Palgrave Macmillan 2022).

²⁸⁸ Sophistication also makes investors self-aware of their own behaviour over time, making them cognizant of their own present bias, a feature that importantly influences financial policy effectiveness as discussed in the following paragraph 2.3.4 on present bias.

programs²⁸⁹, which should include also teaching new skills, self-awareness and techniques for self-improvement to reach changes in investors financial behaviour²⁹⁰. Although D'hondt et al. and Rossi et al.²⁹¹ demonstrate the significant negative relationship between subjective financial literacy and portfolio characterised by environmental and social scores, suggesting that highly educated investors may neglect ESG factors because not conveying financial information. There remains a need to raise awareness about ESG investments to prevent misunderstandings regarding aspects like their risk and return, also in case of highly educated investors (but also of financial advisors) to enable investors to understand and navigate information on sustainability.

Education is of fundamental support in building knowledge especially on ESG investments by providing information about sustainable finance to investors, which, due to the fundamental support of advisors in investment decisions – because of the complexity of the investment sector²⁹²- can be also disseminated through financial advisors. Therefore, together with tailored programs for investors also guidelines and/or educational programmes directed to financial advisors are needed. In this particular case of sustainability preferences assessment, the relationship with investor-financial advisor is very strong because normally those are assessed through a questionnaire delivered and explained by the financial advisor and again the financial advisor is the person that after the assessment, reports sustainability preferences in the suitability assessment, choosing and justifying the suitable financial instruments. However, the expected protective effect of financial education and literacy, on improved decision making, is failing while investors are faced with misleading information, they trusted to be accurate.²⁹³

²⁸⁹ Anders Anderson and David T. Robinson, 'Financial Literacy in the Age of Green Investment' (2021) 19(6) Swedish House of Finance Research 1 <<https://ssrn.com/abstract=3353534>> accessed 27 October 2024.

²⁹⁰ Joanne Yoong, 'Can Behavioural Economics Be Used to Make Financial Education More Effective?' and Vera Rita De Mello Ferreira, 'Can Economic Psychology and Behavioural Economics Help Improve Financial Education?' in *Improving Financial Education Efficiency. OECD key findings and way forward* (OECD 2013) <https://web.archive.org/2016-06-30/408393-Improving_Fin_Ed_effectiveness_through_Behavioural_Economics.pdf> accessed 9 July 2024.

²⁹¹ Catherine D'hondt, Maxime Merli and Tristan Roger, 'What drives retail portfolio exposure to ESG factors?' (2021) 46 (B) Finance Research Letters; Mariacristina Rossi, Dario Sansone, Arthur van Soest and Costanza Torricelli 'Household preferences for socially responsible investments' (2021)105 Journal of Banking and Finance 107.

²⁹² Robert G. Eccles, Mirtha D. Kastropeli and Stephanie J. Potter, 'How to Integrate ESG into Investment Decision-Making: Results of a Global Survey of Institutional Investors' (2017) 29(4) Journal of Applied Corporate Finance 125.

²⁹³ Morris Altman, 'Implications of behavioural economics for financial literacy and public policy' (2012) 41 (5) The Journal of Socio-Economics 677; The Omnibus Directive Proposal, within the Retail Investment Strategy, will also introduce, as expressed harmonized powers under Art. 69 MiFID II, the NCAs' power

2.3.2 Framing effect and heuristic bias

Also, information framing and attribute framing, the order in which alternatives and/or their attributes are presented,²⁹⁴ have a demonstrated important impact on decisions²⁹⁵ by influencing people judgment. In fact, the way relevant information is presented, by targeting a specific audience with both content and form, can influence and manipulate individuals' choices.²⁹⁶

This is because individuals prefer options and information that are framed in an easily understandable manner, can be effortlessly recalled, or elicit an immediate emotional response²⁹⁷. Heuristic, which is a simple cognitive procedure that simplify complex problems into more manageable judgments, can help find adequate, though often imperfect, answers to difficult questions.²⁹⁸ However, the quick, informal, and intuitive mental processes used in heuristic can be a significant source of error due to their overuse or inappropriate application,²⁹⁹ leading to approximate answers.

Suresh's study, on the individual investors behavioural approach to decision-making in investments, confirms that both the heuristic bias and the framing effect provide distinct behavioural biases in investment decisions. Although cognitive capabilities of individual investors are mainly influenced by heuristic bias, the study also discloses that investors use either heuristics or framing when constructing their stock portfolios.³⁰⁰

against misleading marketing practices to restrict access to websites, remove content from the same and conduct mystery shopping activities.

²⁹⁴ Howard Kunreuther and Elke U. Weber, 'Aiding Decision Making to Reduce the Impacts of Climate Change' (2014) (37) *J Consum Policy* 397.

²⁹⁵ David J. Hardisty, Eric J. Johnson and Elke U. Weber, 'A dirty word or a dirty world? Attribute framing, political affiliation, and query theory' (2010) 21(1) *Psychological Science* 86.

²⁹⁶ Barbara Alemanni, 'Retail Investors' Attitude and Preferences and Sustainable Investing Regulation' in Nadia Linciano, Paola Soccorso and Claudia Guagliano (Eds) *Information as a Driver of Sustainable Finance the European Regulatory Framework* (Palgrave Macmillan 2022).

²⁹⁷ Pooya Tabesh, Parnian Tabesh and Kaveh Moghaddam, 'Individual and contextual influences on framing effect: Evidence from the Middle East' (2019) 45(1) *Journal of General Management* 30.

²⁹⁸ Daniel Kahneman, *Thinking Fast and Slow* (Penguin 2012) 499.

²⁹⁹ Daniel Kahneman and Amos Tversky, 'On the psychology of prediction' (1973) 80 *Psychological Review* 237.

³⁰⁰ Gopal Suresh, 'Impact of Financial Literacy and Behavioural Biases on Investment Decision-making' (2024) 13(1) *FIIB Business Review*, 72.

2.3.3 Loss aversion, status quo, and risk perception

The framing effect also highlights how people approach decision-making problems differently depending on whether options are presented as gains or losses.³⁰¹ This because the value perception of the same amount of money varies whether it is a loss (such as having it lost or stolen) or a gain (like have randomly found it or won). Typically, the negative emotions associated with losing that amount are more intense and painful than the happiness experienced from gaining it,³⁰² which empirical studies have estimated to be almost twice painful than gains are pleasurable.³⁰³

These perception asymmetries have been modelled by the prospect theory³⁰⁴ against the same reference point with a functional shape that draws the psychological values of gains as a concave risk aversion function and of losses as a convex shape risk seeking function. The function is anchored to a central point (reference point) that is normally ignored or considered as a neutral state of current wealth, but in fact this create the early state (status quo) versus which people take decisions by evaluating gains or losses against it. The status quo is also where people have the strong tendency to remain because loss aversion manifests as more disadvantageous to leave than having a perceived advantage to remaining.³⁰⁵ Furthermore, in prospect theory the value of an outcome is translated into individual-specific subjective values through its associated probability of occurrence, 'because decision weights that people assign to outcomes are not identical to the probability of these outcomes'.³⁰⁶ Then variations of this probability have less effect on decision weight in respect to stated probabilities.³⁰⁷

Considering that, the intrinsic uncertainty of environmental risk to occur undermines investors' green decision making because not only weight (impact damage entity) influences decisions but also losses from a recognised status quo (such as an example loss of pure air), as well as rationality failure (pro-environmental individuals, who does not invest into

³⁰¹ Daniel Kahneman and Amos Tversky, 'Prospect theory: An analysis of decision under risk' (1979) 47(2) *Econometrica* 263.

³⁰² Daniel Kahneman and Amos Tversky, 'Prospect theory: An analysis of decision under risk' (1979) 47(2) *Econometrica* 263.

³⁰³ Reid Hastie and Robyn M. Dawes, *Rational Choice in an Uncertain World: The Psychology of Judgment and Decision Making* (Sage 2001) 372.

³⁰⁴ Daniel Kahneman, Jack L. Knetsch and Richard H. Thaler, 'The endowment effect, loss aversion, and status quo bias' (1991) 5 (1) *Journal of Economic Perspectives* 193.

³⁰⁵ William Samuelson and Richard J. Zeckhauser, 'Status Quo Bias in Decision Making' (1988) (1) *Journal of Risk and Uncertainty* 7.

³⁰⁶ Daniel Kahneman, *Thinking Fast and Slow* (Penguin 2012) 499, 312.

³⁰⁷ Daniel Kahneman, *Thinking Fast and Slow* (Penguin 2012) 499.

green) and non-polarised probability distribution of events (rare, unpredictable and randomly occurring) make the all factors above relevant to this study.

More in detail, in the case of public response to environmental long-term events, Hertwig and Erev³⁰⁸ noted that people weighted impacts less than what they deserved, according to their objective probabilities. That people underweight rare events is justified by many empirical experiments, because many participants never experienced the rare event. Furthermore, environmental decisions are made under uncertainty (ambiguity) because the available knowledge is not sufficient to estimate a unique probability distribution.

As for the pro-environmental self-identity – such as the individual's tendency to perceive themselves as having a pro-environmental perspective and actively engaging in environmentally friendly actions³⁰⁹- is a significant determinant of carbon offsetting behaviour.³¹⁰ However, a pro-environmental person normally is not investing in green assets.³¹¹ In Wasiuzzaman et al.,³¹² in fact, only in the case of donation-based crowdfunding, respondents identified in transparency, durability and sustainability the most important factors that influenced their decision to invest and not financial motivations. Although, most respondents were aware that all green projects -not only donation-based- are very important to reduce issues in climate change.

While awareness of climate-related risks and its perceptions analysis realised by Lebel et al.³¹³ (by employing in-depth interviews and a quantitative survey conducted across multiple sites in the context of

³⁰⁸ Ralph Hertwig and Ido Erev, 'The description–experience gap in risky choice' (2009) 13(12) Trends in cognitive science 517.

³⁰⁹ Paul Sparks and Richard Shepherd, 'Self-Identity and the Theory of Planned Behaviour: Assessing the Role of Identification with "Green Consumerism."' (1992) 55(4) Social Psychology Quarterly American Sociological Association 388; Ding Li, Luman Zhao, Shuang Ma, Shuai Shao and Lixiao Zhang, 'What influences an individual's pro-environmental behavior? A literature review' (2019) 146 Resources, Conservation and Recycling 28.

³¹⁰ Lorraine Whitmarsh and Saffron O'Neill, 'Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviours' (2010) 30 (3) Journal of Environmental Psychology 305.

³¹¹ Anders Anderson and David T. Robinson, 'Financial Literacy in the Age of Green Investment' (2021) 19(6) Swedish House of Finance Research 1,45 <<https://ssrn.com/abstract=3353534>> accessed 27 October 2024.

³¹² Shaista Wasiuzzaman, Nurul Nabilah Hj Pungut and Muhammad Khaliq Syafie Md Don, 'Crowdfunding green projects in Brunei: awareness and investing preferences' (2021) 32 (6) Management of Environmental Quality 1383.

³¹³ Phimphakan Lebel, Niwooti Whangchai, Chanagun Chitmanat, Jongkon Promya and Luis Lebel, 'Perceptions of climate-related risks and awareness of climate change of fish cage farmers in northern Thailand' (2015) 17 (1) Risk Management Palgrave Macmillan Journals 1.

aquaculture in Northern Thailand) showed high awareness of climate change among farmers, indicating potential differences in risk perception due to recent experiences of adverse effects. Experiences intensified concerns about specific climate-related risks, such as example the perception of drought risks was notably heightened. Understanding risk perception emerged being crucial for enhancing climate risk management.

The same as for awareness and perception also knowledge of climate change has been realised equally important. As for Jama et al. study findings,³¹⁴ climate change knowledge although strongly predicts behavioural intention among young people, it does not similarly influence their attitudes toward forestation. Then to effectively involving young individuals in forestation initiatives for climate change mitigation, knowledge about climate change is required, in addition to, their value orientations and attitudes towards forestation.

Also, Guy et al.³¹⁵ research emphasised the importance of specific climate change knowledge in shaping public beliefs about the issue. The findings of their study indicated a beneficial role of knowledge in shaping the public's perceptions of climate change, suggesting its potential to contribute significantly and constructively to climate change discourse. It highlights the potential for knowledge to positively influence climate change beliefs, although greater knowledge of climate change was causing an increased likelihood of accepting its occurrence.

Consciousness and knowledge about risk perception and biases for investors to prevent irrational investment decisions are the main findings of the reviewed studies³¹⁶ of behavioural finance by Almansour et al. According to many investors, the investment decision-making process is primarily influenced by their perception of risk, and this perception is shaped by several factors, including feedback from previous risky decisions, expectations, and the impact of losses that differ from their expectations.³¹⁷

³¹⁴ Osman M. Jama, Abdishakur W. Diriye and Abdulhakim M. Abdi, 'Understanding young people's perception toward forestation as a strategy to mitigate climate change in a post-conflict developing country' (2023) 25 *Environ Dev Sustain* 4787, 7.

³¹⁵ Sophie Guy, Yoshihisa Kashima, Iain Walker and Saffron O'Neill, 'Investigating the effects of knowledge and ideology on climate change beliefs' (2014) 44 *The social psychology of climate change European Journal of Social Psychology* 421.

³¹⁶ Bashar Yaser Almansour, Sabri Elkrghli and Ammar Yaser Almansour, 'Behavioral finance factors and investment decisions: A mediating role of risk perception' (2023) 11 *Cogent Economics and Finance* 1.

³¹⁷ Elke U. Weber and Richard A. Milliman, 'Perceived Risk Attitudes: Relating Risk Perception to Risky Choice' (1997) 2 *Management Science* 123; Paul Slovic 'Trust, emotion, sex, politics, and science: Surveying the risk-assessment battlefield.' in Max H. Baserman, David M. Messick, Ann E. Tenbrunsel and

2.3.4 Present bias, myopia, intertemporal discounting.

People perceptions are affected by psychological distance from objects and events also in the case of climate change.³¹⁸ Then, only when climate change risk is perceived closer, people will engage more easily in pro-environmental and resilient behaviours compared to when it is seen as distant.³¹⁹ The tendency of people to favour immediate gratification (or avoid non-gratification) at the expense of future gratification, called present bias,³²⁰ is also a model that sharply discounts all future periods. Present bias can be drawn as a hyperbolic function, which shows preferred immediate rewards over larger but later ones. Preferences of hyperbolic discounters can be different depending on when they make the investment evaluation. In case of a decision maker, who is not self-aware of his present bias, called naïve, extra weight will be given to current well-being over any future moment, as well as all future moments weighted equally. It

Kimberly A. Wade-Benzoni (Eds), *Psychological Perspectives to Environmental and Ethical Issues in Management*. (Jossey-Bass, 1999) 277.

³¹⁸ Rachel I. McDonald, Hui Yi Chai, and Ben R. Newell, 'Personal experience and the 'psychological distance' of climate change: an integrative review' (2015) 44 *J. Environ. Psychol.* 109.

³¹⁹ Roberta Maiella, Pasquale La Malva, Daniela Marchetti, Elena Pomarico, Adolfo Di Crosta, Rocco Palumbo, Luca Cetara, Alberto Di Domenico and Maria Cristina Verrocchio, 'The Psychological Distance and Climate Change: A Systematic Review on the Mitigation and Adaptation Behaviors' (2020) 11 *Front. Psychol.* 1.

³²⁰ This paragraph is mainly based on the following literature: Richard H. Thaler and Hersh M. Shefrin, 'An economic theory of self-control' (1981) 89(2) *Journal of Political Economy* 392; Hersh M. Shefrin and Richard Thaler, 'The Behavioral Life-Cycle Hypothesis' (1988) 26(4) *Economic Inquiry* 609; Ted O'Donoghue and Matthew Rabin, 'Present bias: Lessons learned and to be learned' (2015) 105(5) *American Economic Review* 273; David Laibson, 'Golden eggs and hyperbolic discounting' (1997) 112(2) *Quarterly Journal of Economics* 443; Stephan Meier and Charles D. Sprenger 'Present-biased preferences and credit card borrowing' (2009) *IZA Discussion Papers*, 4198 <<https://nbn-resolving.de/urn:nbn:de:101:1-20090615131>> accessed 9 July 2024; George Loewenstein and Drazen Prelec, 'Anomalies in intertemporal choice—Evidence and an interpretation' (1992) 107(2) *Quarterly Journal of Economics* 573; George Loewenstein and Richard H. Thaler, 'Anomalies: Intertemporal Choice' (1989) 3 (4) *Journal of Economic Perspectives* 181; Shane Frederick, George Loewenstein and Ten O'Donoghue, 'Time discounting and time preference: A critical review' (2002) 40(2) *Journal of Economic Literature* 351; Xavier Gabaix and David Laibson, 'Myopia and Discounting' (2017) *NBER Working Paper Series* 3/2017 <<https://www.proquest.com/docview/1878815827?pq-origsite=primo&sourcetype=Working%20Papers>> accessed 22 October 2024; Steffen Andersen, Glenn W. Harrison Morten Lau and E. Elisabet Rutström, 'Discounting behavior: A reconsideration' (2014) 71(C) *European Economic Review* 15; Kenneth J. Arrow, William R. Cline, Karl-Goran Mahler, Mohan Munasinghe, R. Squitieri and Joseph E. Stiglitz, 'Intertemporal Equity, Discounting, and Economic Efficiency' (1996) in *Climate Change 1995: Economic and Social Dimensions of Climate Change Contribution of Working Group III to the Second Assessment Report of the Intergovernmental Panel on Climate Change*. Chapter 4; Tal Shavit and Mosi Rosenboim, 'Is there time discounting for risk premium?' (2015) 2 (103) *Journal of the Experimental Analysis of Behavior* 393; Laurie Hendrickx and Sietske Nicolaj, 'Temporal discounting and environmental risks: The role of ethical and loss-related concerns' (2004) 24(4) *Journal of Environmental Psychology* 409; Gareth P. Green and Timothy J. Richards, 'Discounting Environmental Goods' (2018) 43(2) *Journal of Agricultural and Resource Economics* 215.

is only the present bias which influences naïve people preferences over future allocations, because of that any future allocation will not coincide with the preferences of their future selves over the same allocations. Then, if present-biased people are or are not cognizant of their own present bias, it is important since several policy implications for finance depend critically on investor sophistication.³²¹

A sophisticated hyperbolic decisions maker, instead, recognizes that his behaviour over time is the outcome of a game among different temporal selves. A sophisticated person acts sooner than a naive person with the same preferences, irrespective of whether rewards or costs are immediate. It does so by maximizing both the present value and the future value -by trading it till an intertemporal optimum for future selves is found - which is represented by a nearly flat hyperbolic discount function in the far future.

Furthermore, by giving significance to climate change impact, beyond a certain time-horizon, hyperbolic discounted investments would have larger values in the future than the ones evaluated with a constant discount factor. In this case, discounting for a day or a week from now, in a year time, is virtually identical, if future risk is disregarded because the steadily decreasing constant discount rate of an exponential function is assuming an unchangeable situation in the future meaning that the value of an outcome received today, or with a delay, is independent of when that delay occurs. This can lead investors to sustain unforeseeable bigger losses on investment outcomes in the future, than the ones they would have afforded by discounting an increasing future risk in the present. Furthermore, as for Frederick et al.³²² findings, empirical evidence indicates that people discount differently as gains are discounted more than losses, as well as small amounts are discounted more than large amounts.

2.3.5 Default option

Default is related to the status quo bias, as people prefer to choose a default option they see it as aligned with the status quo, such as leaving savings untouched, rather than if they perceive default to be conflicting

³²¹ Stephan Meier and Charles D. Sprenger 'Present-biased preferences and credit card borrowing' (2009) IZA Discussion Papers, 4198<<https://nbn-resolving.de/urn:nbn:de:101:1-20090615131>> accessed 9 July 2024.

³²² Shane Frederick, George Loewenstein, and Ted O'Donoghue, 'Time Discounting and Time Preference: A Critical Review' (2002) 40 Journal of Economic Literature 351,362.

with the status quo.³²³ This suggests that default legal rule that applies to individuals who do not make explicit choices from the available options, can potentially influence behaviour changes in any case, also when the effort required to opt out of the default is minimal but aligned with their status quo.³²⁴ Furthermore, if default is also perceived as a reference point, deviations from it may become psychologically aversive.³²⁵ Because according to the loss aversion theory gains earned from the deviation (e.g., more savings) will be weighted half as much as the related losses (e.g., less consumption).³²⁶ It is then crucial to carefully consider the type of default option being offered, also because most people can also choose it simply since it is the default, without scrutinizing it further- such as subscriptions with automatic renewal-³²⁷ and not all default options are ideal for decision-makers.

There are cases, in fact, in which active decision-making, by encouraging investors to think about important decisions, becomes an optimal alternative to defaults. For example, when investors have a strong propensity to procrastinate, although this may force financially unsophisticated investors to make uninformed time-consuming decisions.³²⁸ Under these circumstances active-decision interventions are of useful implementation because the one-choice-suits-all option will not be applicable. Default options are a valuable policy solution, in case of high degree of homogeneity and/or limited expertise of decision makers, instead.³²⁹

In case investors fail to make a choice, they would like to be systematically offered by financial advisers' sustainable investment products as a default

³²³ David de Meza, Bernd Irlenbusch and Diane Reyniers (London School of Economics), 'Financial Capability: A Behavioural Economics Perspective' (2008) 69 *Financial Services Authority Consumer Research* <<https://www.fca.org.uk/publication/research/fsa-crpr69.pdf>> accessed 05 July 2024.

³²⁴ Russell B. Korobkin, 'Libertarian Welfarism' (2009) 97 (6) *California Law Review* 1651.

³²⁵ James J. Choi, David Laibson, Brigitte C. Madrian and Andrew Metrick, 'Optimal Default' (2003) 93 *American Economic Review Papers and Proceedings* 180.

³²⁶ For more information on gains and losses perceptions see paragraph 3.3 of this chapter.

³²⁷ Vera Rita De Mello Ferreira, 'Can Economic Psychology and Behavioural Economics Help Improve Financial Education?' in *Improving Financial Education Efficiency. OECD key findings and way forward* (OECD 2013) <https://web-archiv.oe.cd.org/2016-06-30/408393-Improving_Fin_Ed_effectiveness_through_Behavioural_Economics.pdf> accessed 9 July 2024, 61.

³²⁸ Gabriel D. Carroll, James J. Choi, David Laibson, Brigitte C. Madrian, and Andrew Metrick, 'Optimal Defaults and Active Decisions' (2009) 124 *Quarterly Journal of Economics* 1639; James J. Choi, David Laibson, Brigitte C. Madrian and Andrew Metrick, 'Optimal Default' (2003) 93 *American Economic Review Papers and Proceedings* 180.

³²⁹ Gabriel D. Carroll, James J. Choi, David Laibson, Brigitte C. Madrian, and Andrew Metrick, 'Optimal Defaults and Active Decisions' (2009) 124 *Quarterly Journal of Economics* 1639.

option,³³⁰ to be aligned with the risk profile identified by the suitability assessment. Although, study findings report defaults more unlikely to be effective when involving environmental decisions,³³¹ default options can be very effective on financial choices if considered as a simplification eliminating the immediate mental burden of financial decision-making dealing with complexity and ambiguity.³³² Then, an improved financial decision-making can be realized when, as integral part of investor protection, an impartial entity, such as a governments and legislators ensure that investors receive the information they need in an understandable format along with tools to help them better grasp that information and select suitable defaults.³³³

2.4 PSYCHOLOGICAL PROCESSES TO MAKE GREEN DECISIONS IMPLEMENTED.

This paragraph establishes the compatibility of the questionnaire's design with the behavioural economics context as above described, by defining suitable choice architecture parameters to shape questionnaire's questions accordingly to the identified techniques of behavioural bias mitigation. The questionnaire – to be validated with this research - includes five tasks. First three tasks concern sustainability preferences assessment, evaluation and prioritisation, while the remaining two tasks consider i) assessing respondents' loss aversion for climate change investments; and ii) evaluating impact of climate change on investments, by calculating respondents discount factor resulting from a lottery through which respondents express their value for a green investment in the short and long term.

Questions, included on tasks that analyse sustainability preferences assessment, evaluation and prioritisation, are innovatively constructed using multiple choices, lottery and scaling methods to choose among

³³⁰ European Commission, 'Consultation on the renewed sustainable finance strategy. Summary of responses.' Question 3 page 17: 68% of respondents asked for a green default option. For more information see paragraph 1.3.4.1 of chapter I on green default importance for retail investors.

³³¹ Jon M. Jachimowicz, Shannon Duncan, Elke U. Weber and Eric J. Johnson, 'When and why defaults influence decisions: A meta-analysis of default effects' (2019) 3(2) Behavioural Public Policy 159.

³³² David de Meza, Bernd Irlenbusch and Diane Reyniers (London School of Economics), 'Financial Capability: A Behavioural Economics Perspective' (2008) 69 Financial Services Authority Consumer Research <<https://www.fca.org.uk/publication/research/fsa-crpr69.pdf>> accessed 05 July 2024; Brigitte C. Madrian and Dennis F. Shea, 'The Power of Suggestion: Inertia in 401(k) Participation and Savings Behavior' (2001) 116(4) The Quarterly Journal of Economics 1149.

³³³ Morris Altman, 'Implications of behavioural economics for financial literacy and public policy' (2012) 41 (5) The Journal of Socio-Economics 677.

companies of which the description is aligned with the taxonomy's objectives (mitigation, adaptation, sustainable use of water, transition to a zero-waste economy, preventing pollution and biodiversity protection), criteria and requirements. This also include the possibility of confronting the invested amount in each company with the company selection of each respondent to integrate respondents' sustainability preferences assessment with and evaluation choices consistency. While the analysis of the objective prioritisation, done through respondent's ranking of the six taxonomy objectives, identifies investors preferred sustainable economic activity the chosen company should run together with the traditional main business of food manufacturer.

Respondents risk perception of gain and losses, calculated with task four, is using the convalidated scale of Li et al.³³⁴ adapted to climate change. The Likert scale is transposed to a 7-point numeric scale - from -3 strongly disagree, -2 disagree, somewhat agree, 0 neither agree nor disagree to +1, +2 and +3 strongly agree- to estimate respondents' loss aversion for climate investments. Task five evaluates intertemporal choices by asking respondents to solve a lottery of amounts by choosing their forecasted green investment outcome in a determinate date (one year time; 2030, which is EU fit for 55 deadlines; and 2050 the EU climate neutrality time limit). A discount rate for each choice is calculated to be compared with respondents' sustainability preferences to identify the direction and strength of the correlations. While the average value of these evaluations over the years corresponds to the respondent discount factor to be correlated with his own sustainability preferences to confront revealed preferences with climate risk perception (loss aversion) and evaluation (discount factor).

Furthermore, the combination of these traits -loss aversion and discount rate- leads to the identification of the suitability of these profiles for a green nudge.³³⁵ Which means to apply the above elements of choice architecture (framing, information load, simplification etc.) to influences people's behaviour toward green investments in a predictable manner without restricting any available investment option.

³³⁴ Jin Li, Linlin Chai, Onnolee Nordstrom, Chanchai Tangpong, and Kuo-Ting Hung, 'Development of a Loss Aversion Scale.' (2021) 33(1) Journal of Managerial Issues. 69.

³³⁵ See paragraph 3.5.1 green nudge chapter III.

2.4.1 Information load, quality and complexity bias mitigation

The questions inserted in the questionnaire have been designed to consider the salience effect,³³⁶ which avoid information load by highlighting most important green features of a company by using in the description the language, concept and criteria of the taxonomy.³³⁷ This also to avoid 'greenwashing'.³³⁸

Company descriptions in the questionnaire are highly consistent with the EU Taxonomy language, which built the knowledge on what is green using scientific definitions, then is also providing the best quality of information for what is a sustainable economic activity. Five themes have been extrapolated from the taxonomy, such as energy, bio methods, chemical, CO2 emissions and transportation to have a range of options, selected to three through the pilot questionnaire exercise run with university students. Although the use of the taxonomy gives quality description of green relying on empirical evidence, respondents reported on the complexity of the language, which for some of them was not clearly understandable.

Essential information is given to respondents through the consent form (to which they are asked to agree to, to be able to continue) regarding the questionnaire, their data treatment and privacy. This to build consciousness on the respondents about the tasks' meaning. Furthermore, in task 5 on discount factor evaluation, respondents are asked to insert their own value of green investment they would receive at the end of five periods of investments. By physically entering the detail, is assumed that the respondent has read and understood the disclosed information. While the interactive task used to assess preferences through the drag and drop feature also simply the use of the questionnaire in practice, by reducing the complexity of implementation.

Furthermore, the dissemination of the constructed questionnaire for sustainability preferences assessment is promoting a behavioural change by raising investor awareness to reduce information gaps, distrust and behavioural biases towards green investments. Then, the questionnaire analysis wants improving the understanding of investors green values and green behavioural changes to implement green investment. Both awareness and understanding are needed to be transformed in meaningful decision making to effectively lead action toward climate neutrality.

³³⁶ As for paragraph 2.3.2 of this chapter the salience effect for this questionnaire includes standardisation of green investment using the taxonomy.

³³⁷ For more information on the taxonomy legal features see paragraph 1.5, chapter I.

³³⁸ See paragraph 2.3.1 of this chapter and footnote 204 for more information on 'greenwashing'.

2.4.2 Framing effect and heuristic bias mitigation

The order of questionnaire's questions has been randomised not to have the Taxonomy objectives displayed from 1 to 6 and the companies from A to F always in the same order. This because, through the pilot test, it was noticed that the use of combinations of two companies was favouring mostly the choice of company A or the first disclosed.

Furthermore, by displaying companies' description relying on empirical evidence in three different domains, the questionnaire seeks to introduce diverse perspectives and a more comprehensive information on green companies, to encourage critical choice. This to soften the heuristic bias by supporting more informed and rational decisions. Also, the portfolio amount of 9000 has been chosen to be possibly divided equally by six, but not as easily as dividing 6000, some mental effort should be needed this to avoid heuristic

Below are the matrices reporting the carried-on analysis of the pre-tested questionnaire on the domain choices. Each of the five matrix is related to a domain -bio-methods, transport, chemicals, CO2 emissions and energy respectively- disclosing the best choices on rows over the alternatives, which are reported on columns. Every row total shows the best choice of each company/objective of which the summation of each row led to the choice of best domains. Cells highlighted with green colour show the best choice for each domain. The three chosen domains, to be inserted in the final questionnaire, are bio-methods (491 choices), chemicals (426) and CO2 emission (373).

Table 1: Domain selection for final questionnaire framework.

Dominion1	A	B	C	D	E	F	Row Totals
A		28	18	19	18	27	110
B	9		11	14	16	25	75
C	17	21		19	28	19	104
D	14	18	13		15	25	85
E	15	16	13	17		25	86
F	6	7	4	7	7		31
TOTAL OF							491

Dominion2	A	B	C	D	E	F	Row Totals
A		14	12	11	10	11	58
B	3		6	6	5	8	28
C	5	11		7	8	11	42
D	6	11	10		12	14	53
E	7	12	9	5		2	35
F	6	9	6	3	5		29
TOTAL OF							245

Dominion3	A	B	C	D	E	F	Row Totals
A		17	13	12	14	21	77
B	13		10	9	10	14	56
C	17	18		10	16	16	77
D	17	19	18		16	17	87
E	15	18	12	12		13	70
F	7	14	12	11	15		59
TOTAL OF							426

Dominion4	A	B	C	D	E	F	Row Totals
A		16	17	16	15	13	77
B	11		13	15	17	14	70
C	9	12		15	11	12	59
D	10	10	10		9	8	47
E	11	8	13	14		10	56
F	12	11	13	15	13		64

Dominion5	A	B	C	D	E	F	TOTAL OF	
A			11	14	14	14	15	68
B	12			14	10	12	12	60
C	9	9			10	9	11	48
D	9	13	13			11	12	58
E	9	11	14	12			10	56
F	8	11	12	11	13			55
							TOTAL OF	345

MAX

Source: elaborated by the author

2.4.3 Loss aversion, status quo and risk perception.

To evaluate loss aversion, this study adapted to climate change the validated scale of Li et al.,³³⁹ which measures, without relying on complex field experiments, gains and losses not only in terms of monetary loss but also in situations where a change in the status quo affects investors' portfolio management strategies. The scale, tested through a series of regression analyses, evaluates how the composite loss aversion score predicts human behaviour, that deviate from rational theories, of the endowment effect,³⁴⁰ the sunk cost fallacy,³⁴¹ and the likelihood to participate in lottery games together with the two tendency scales of risk aversion and risk propensity. Sunk cost fallacy and endowment effect are captured and represented by the prospect theory, where a cost borne moves the decision maker's reference point to the loss domain, making

³³⁹ Jin Li, Linlin Chai, Onnolee Nordstrom, Chanchai Tangpong, and Kuo-Ting Hung, 'Development of a Loss Aversion Scale.' (2021) 33(1) Journal of Managerial Issues. 69.

³⁴⁰ Endowment effect is underweighting the opportunity costs created by "removing a good from the endowment [which] creates a loss while adding the same good (to an endowment without it) generates a gain." Richard Thaler, 'Toward a positive theory of consumer choice' (1980) 1 Journal of Economic Behavior and Organization 39, 44.

³⁴¹ Sunk cost fallacy is "the tendency of a decision maker to continue on an endeavor, after some type of investment, such as money or time, has been made and is not recoverable." Andrew M. Davis, 'Biases in individual decision-making' in Karen Donohue, Elena Katok and Stephen Leider (Eds.), *The handbook of behavioral operations* (Wiley Blackwell 2019) chapter 5, par 5.3.4.

investors risk seekers,³⁴² while risk averse investors will show the general preference for certainty rather than uncertainty.³⁴³

Furthermore, the included green component can be considered such a moderating factor, because investors want to simultaneously express personal values while investing,³⁴⁴ the scale, by comprising emotions that would affect loss aversion for green investments,³⁴⁵ will assess investors who are risk-averse when it comes to gains, risk-seeking when facing losses, exhibit loss aversion, and do not rely on actual probabilities during evaluation, revealing even more aligned findings to prospect theory,³⁴⁶ and environmental risks.³⁴⁷

2.4.4 Present bias and intertemporal choices.

Through the fifth task of the questionnaire, a lottery, respondents' investment values for the future are assessed. Investments that contribute to climate neutrality in 2050 and two intermediate steps are evaluated – such as 2025 (one year time) and 2030 (fit for 55 milestone) – to compose the intertemporal task. Values will integrate the knowledge on how investors arrange their portfolios according to their risk perception (task four on loss aversion) with respondent's discount rate for each choice. The discount factor is calculated by applying the objective function method³⁴⁸ and then aggregate. The calculated respondent discount factor will be confronted with his own sustainability preferences and risk perception in term of loss and gain aversion.

Drawing the discount factor function will also allow to evaluate the existence of a present bias, which makes the difference in identifying sophisticated or naïve investors.³⁴⁹

³⁴² Andrew M. Davis, 'Biases in individual decision-making' in Karen Donohue, Elena Katok and Stephen Leider (Eds.), *The handbook of behavioral operations* (Wiley Blackwell 2019).

³⁴³ Daniel Kahneman and Amos Tversky, 'Prospect theory: An analysis of decision under risk' (1979) 47(2) *Econometrica* 263. For more information on prospect theory see also paragraph 2.3.3 of this chapter.

³⁴⁴ Herwig Pilaj, 'The Choice Architecture of Sustainable and Responsible Investment: Nudging Investors Toward Ethical Decision-Making' (2017) *Journal of Business Ethics* 743.

³⁴⁵ Raymundo M. Campos-Vazquez and Emilio Cuijly, 'The role of emotions on risk aversion: A Prospect Theory experiment' (2014) 50 *Journal of Behavioral and Experimental Economics* 1.

³⁴⁶ Amos Tversky and Daniel Kahneman, 'Advances in prospect theory: cumulative representation of uncertainty' (1992) 5 (4) *Journal of Risk and Uncertainty* 297.

³⁴⁷ See paragraph 2.3.3 of this chapter for more detail on environmental risk mapping.

³⁴⁸ Methodology for discount rate calculation is further described in chapter III at paragraphs 3.2.2.

³⁴⁹ As explained in paragraph 2.3.4 of this chapter.

2.4.5 Default application

Current research on choice architecture do not establish the success of default implementation and which are the factors to design default effectiveness.³⁵⁰ Furthermore, behavioural implications of default bias and outcomes are not thoroughly investigated in case in the particular case of environmental policies.³⁵¹

However, when default nudges are proposed with the explicit goal of increasing welfare of people, these can lead to a better decision people would have made if they had full information, unlimited cognitive capacity, and perfect self-control.³⁵² Furthermore, studies find statistical significance of default choices, if close to people's actual preferences³⁵³ and a green default has been requested by retail investors during the consultation process of the Sustainable Finance Strategy review.³⁵⁴ Then this study wants also to integrate its findings on investors green capacities and behavioural to construct a green default, which can be created at a reduced cost if only a small adjustment in the choice architecture have to be made or a shift in communication and information frame is to be implemented.³⁵⁵

Default influences choice architecture through three main identified factors,³⁵⁶ such as, a policy recommendation option suggested by a policy makers or experts because supported and justified by additional information; or a choice option, which implies less cognitive effort for the investor, and/or because is anchored or close to the status quo, from which changes can be seen as a loss.³⁵⁷

³⁵⁰ Jon M. Jachimowicz, Shannon Duncan, Elke U. Weber and Eric J. Johnson, 'When and why defaults influence decisions: A meta-analysis of default effects' (2019) 3(2) Behavioural Public Policy 159.

³⁵¹ Jorge E. Araña and Carmelo J. León, 'Can Defaults Save the Climate? Evidence from a Field Experiment on Carbon Offsetting Programs' (2013) 54 Environ Resource Econ 613.

³⁵² Richard H. Thaler and Cass Sunstein, 'Libertarian Paternalism' (2003) 93 (2) American Economic Review 175.

³⁵³ Fredrik Carlsson, Christina Gravert, Olof Johansson Stenman, and Verena Kurz, 'Nudging as an Environmental Policy Instrument' (2019) Working Paper Series 4 <<https://ssrn.com/abstract=3711946>> accessed 23 October 2024.

³⁵⁴ See paragraph 1.3.4.1 of chapter I on green default importance for retail investors.

³⁵⁵ Jorge E. Araña and Carmelo J. León, 'Can Defaults Save the Climate? Evidence from a Field Experiment on Carbon Offsetting Programs' (2013) 54 Environ Resource Econ 613.

³⁵⁶ Cass Sunstein and Lucia Reisch, 'Automatically Green: Behavioral Economics and Environmental Protection' (2013) 38 Harvard Environmental Law Review 127; Fredrik Carlsson, Christina Gravert, Olof Johansson Stenman, and Verena Kurz, 'Nudging as an Environmental Policy Instrument' (2019) Working Paper Series 4 <<https://ssrn.com/abstract=3711946>> accessed 23 October 2024; Eric J. Johnson and Daniel G. Goldstein, 'Do Defaults Save Lives?' (2003) 302 Science 1338 <<https://ssrn.com/abstract=1324774>> accessed 23 October 2024.

³⁵⁷ Both default options are analysed in paragraph 3.5 of this chapter.

Together of practical implementation factors of defaults, there are also important ethical implications, which, although remains a significant gap in academic literature when it comes to addressing the ethical and practical outcomes of green nudge³⁵⁸, ethical outcomes have been clearly summaries by Lemken³⁵⁹ in six categories: i) choice architecture structure of default and active choice,³⁶⁰ ii) framing effects and costs,³⁶¹ iii) psychological effects mechanisms: effort, cognitive bias, as loss aversion³⁶² and implied endorsement – e.g. policy recommendations- iv) visibility of decision when a clear opt out possibility and alternative is shown, v) customisation³⁶³ and vi) disclosure.³⁶⁴

All those options have been evaluated in this study, to be included in the questionnaire as discussed in the paragraphs above, then making the ground for default option implementation as a possible green nudge³⁶⁵ to be included in the suitability assessment.³⁶⁶

2.5 AN INSTRUMENT TO EVALUATE SUSTAINABILITY PREFERENCES AND GREEN BEHAVIOURS.

Although there have been several attempts to implement the regulation disclosed on chapter I of this research, solutions at this stage, have not been effective in efficiently evaluate private investors' sustainability preferences.³⁶⁷ The main research objective of this research is to develop an instrument, here a questionnaire, that assesses, evaluates, and prioritises mitigation versus adaptation preferences and versus

³⁵⁸ Marta Santos Silva, "Nudging and Other Behaviourally Based Policies as Enablers for Environmental Sustainability" (2022) 11(1) *Laws* 9.

³⁵⁹ Dominic Lemken, 'Options to design more ethical and still successful default nudges: a review and recommendations' (2024) 8 *Behavioural Public Policy* 349.

³⁶⁰ See paragraph 2.3.5 of this chapter.

³⁶¹ See paragraph 2.3.2 of this chapter.

³⁶² See paragraph 2.3.3 of this chapter.

³⁶³ See paragraph 3.5.1 chapter III for more details on smart and smarter default options.

³⁶⁴ See paragraph 2.3.1 of this chapter.

³⁶⁵ See paragraph 3.5 of chapter III of this study for the discussion of a green default definition and possibility of implementation.

³⁶⁶ See paragraph 1.6.5 of chapter I for the possible legal framework of a green default.

³⁶⁷ Francesco Adria, Nadia Linciano, Francesco Quaranta, and Paola Soccorso, 'Profilazione della clientela ai fini della valutazione di adeguatezza. *Follow up* dello studio del 2012 su un campione di intermediari italiani' (2022) CONSOB Discussion Papers 11/2022, 7 <<https://www.dirittobancario.it/wp-content/uploads/2022/11/Discussion-Paper-Consob.pdf>> accessed 10 February 2024. See also foot note n.79.

environmentally sustainability preferences in line with EU regulation application to be confronted with investors climate profile.

Then the study firstly answers the main research question of assessing, evaluating and prioritising sustainability preferences. Sustainability preferences are evaluated to be integrated in the suitability assessment as requested by MIFID II regulation and in line with ESMA recommendation, successively to the assessment process of profiling investors' financial knowledge, investment objectives and financial situation, now profiled with a questionnaire as the instrument. The second research question answer will lead through the evaluation of the client climate risk profile – including risk perception aversion and evaluation – to a further analysis of sustainability preferences, as the study of the relationship between client climate profile and preferences to understand how to nudge relevant investors behaviour towards sustainable investments and carbon neutrality.

Overall, the questionnaire wants to explore respondent's choice to invest in one traditional company of which 10% of its turnover is created by the investment in one of the six different environmentally sustainable economic activities, as identified by the EU Taxonomy. Three different domains are confronted, bio-methods, chemicals, and CO2 emissions.

This to:

- Assess and evaluate sustainability preferences of respondents choosing between six companies, of which the description will be randomly presented, three times (one for each domain).
- Evaluate consistency of choices between the assessment of companies and the evaluation of them, through the devolvement of a portfolio investment of 9.000 GBP to the six companies, again randomly presented.
- Rank preferences for the six taxonomy objectives by prioritising the best option (ranked 1) till the worse (ranked 6), not randomised.
- Evaluate loss aversion for possible gains and losses linked to green investments through the Li et al. loss aversion scale adapted to climate change that is correlating risk aversion and risk propensity through a total of eight questions.
- Calculate respondent's discount factor, as preferences for the future in terms of green investments, with an intertemporal lottery of five questions. Loss aversion and discount data will be confronted with sustainability preferences choices to analyse the relationship of those with respondent risk perception for green investments.

Through first a pilot trial³⁶⁸ and then a second dissemination of a final questionnaire³⁶⁹ to university students allowed the below results:

- (a) identify a hierarchy of sustainability domains, which resulted first bio methods, then chemical solutions, Co2 emissions reduction, energy and last transportation. This exercise led to the selection of the best definition of the companies and in some cases to the rewording of some questions.
- (b) assess the construct validity of the developed questionnaire, and
- (c) reduce the questionnaire to a short-item format via factor-analytic methods to be compatible with the financial risk profile of investors.

The new questionnaire has been formalised on QuestionPro as the tested pilot questionnaire and disseminated again to reach the predetermined number of respondents, which was calculated using G*Power, with an ANOVA test of repeated measures between factors, an F tests with a medium effect size of 0.25, alpha 0.05, and beta 0.95, the sample size was at 132 individuals. Respondents are the best representativeness of a sample of young investors in terms of age, sex, race, social backgrounds, etc., based in the UK.

The two sub-research questions to be answered by the empirical study using the questionnaire and its findings analysis are disclosed in the following paragraphs together with the hypothesis to be tested.

2.5.1 Sustainability Preferences will be affected by the kind of sector the company is investing in?

Identifying company, A as implementer of mitigation action, B of adaptation, C of sustainable use and protection of water, D the transition to a zero-waste economy E of pollution prevention and control vs protection and F restoration of biodiversity and ecosystems:

If company A, (or B, C, D, E, F) is more attractive to investors than company B (or A, C, D, E, F), will be selected as recipient of investors sustainability preferences. Additionally, to this, participants will also allocate across companies the amount of the investment portfolio of 9.000 GBP to be evaluated. Furthermore, respondents will prioritise the six environmental objectives, related to the environmentally sustainable

³⁶⁸ See paragraph 3.4.1 of Chapter III for more results of the pilot test.

³⁶⁹ See paragraph 3.4.2 of Chapter III for final questionnaire results analysis.

actions of companies A, B, C, D, E, F, as identified by the Taxonomy descriptions.

Sub Q2³⁷⁰: Do sustainability preferences of investors change depending on the environmental objectives of the company (mitigation vs adaptation vs sustainable use and protection of water vs the transition to a zero-waste economy vs pollution prevention and control vs protection and restoration of biodiversity and ecosystems)?

H2a – (a) How often investors decide to invest in a company and (b) how much they are willing to invest varies depending on the company's environmental objective.

H2b – The frequency of investments and the amount of investments is positively correlated across environmental objectives and both correlate negatively with the prioritisation of the environmental objectives.

H2c – Do Investor's differ in how much they prefer investing into one company objective?

2.5.2 Is the perception of losses and gains and value of time due to climate change actions influencing investors choices?

Investor's perception on losses and gains and value of time influences the investor preferences for different company-level sustainability actions and capital allocation choices. For example, a higher value for the future is linked to a forward-looking investing profile that will lead to prefer climate mitigation actions (i.e. more benefits arise in the future) over adaptation actions (i.e. more benefits in the present). A higher loss aversion will lead to making more conservative and prudential investment choices. While a high/low discount rate will reduce/increase the value of future green investments.

Sub Q3: Are sustainability preferences of investors influenced by how investors value gain or losses and/or value the future?

³⁷⁰ Main research question discussed in chapter I paragraph 1.6.6 is the following: Is the current legal framework concerning disclosure and suitability assessment, supporting sustainability preferences assessment implementation, adequate to contribute to the green deal carbon neutrality objective? The use of nudging in the suitability assessment, by improving investors' choice adequacy for green financial products, leads to a better level of private investors protection?

H3a – how often and how much investors are willing to invest into mitigation (compared to adaptation) correlates with loss aversion. Such as high loss aversion will lead to more conservative and prudential investment choices which can discourage mitigation investments with long term benefits (e.g., wetland restoration).

H3b – how often and how much investors are willing to invest into mitigation (compared to adaptation) correlates with discount rate. Such as high value for the future (low discount rate) is linked to a forward-looking investing profile that will lead to prefer climate mitigation actions (i.e. more benefits arise in the future) over adaptation actions (i.e. more benefits in the present).-

H3c – How investors distribute their investments across objectives (H2c) is correlated with loss aversion. Specifically, investors who distribute investments equally (compared to having strong preferences for one objective) may show stronger loss aversion.

H3d – Loss aversion for green investments and discount factor should correlate. Such as a high loss aversion will lead to making more conservative and prudential investment choices which normally correspond to a high discount rate then investments with short term benefits.

2.6 METHODS

2.6.1 Participants and recruitment

The research objectives of investors' green decision-making leads to a population of interests made of investors. Investors are clients of investment fund, financial institutions and other financial platforms providing alternative finance instruments, willing to invest their saving to buy a financial instrument. People based in the UK will be considered at large, with no distinction of age, education level and gender, because these characteristics will be identified through a question in the questionnaire itself. Participants with residency in the UK, accessed the QuestionPRO link through the Research Participation Scheme of Bath University³⁷¹ Platform or through the Question Pro link as disseminated by

³⁷¹ SONA system University of Bath <https://bath-psychology.sona-systems.com/Default.aspx?ReturnUrl=%2fmain.aspx>.

the researcher personal network. The majority of selected people were female, undergraduate university students aged 18-23. This to raise awareness on green investors decision making³⁷² for young investors. An academic credit is offered to participants who consistently filled the survey. Then, a check on the time used to complete the data was run as attention check.

Each individual received, included in the survey link (questions as previously set in the QuestionPro platform to form the survey) the related information sheet and a consent form for participation, to be returned together survey completion. After completion of the survey, debriefing information will appear on the last page of the survey.

The so-called snowball sampling method will also be used by asking participants to refer other potential participants for the survey. This method will be useful to reach the population of interest, since is considered that an important contribution in terms of participation to the survey will come from people with similar sensibility, people who is aware/interested and committed with climate change and other environmental and/or development matters. Although probably mostly environmental responsible people will answer the survey, this is not considered a bias, as the possibility to assess, evaluate and prioritise sustainability preferences through a validated questionnaire will be the most important result of the research. Then volunteers will not differ from the general population a part of possible general responsive attitude towards the environment.

Also, researchers' professional network and social networks has been utilised, to reach survey participants. In this case if the connection was with professionals who may be interested in participating in the study, participants will not act in their professional capacity but as retail investors. The researcher's interest in rising awareness to green investments by disseminating the questionnaire, throughout young people to involve them in the matter has been reach by disseminating the questionnaire through the University of Bath platform named Research Participation Scheme, through which the questionnaire was made available till the expiring date of the Ethics reference (n.1826-3832) given by the Social Science Research Ethics Committee of the University of Bath.

Since respondents are based in the UK, the evaluation of the consistency of the EU Taxonomy description has been analysed. The EU taxonomy

³⁷² Participants are disclosed on Table 3 Demographical characteristics, as part of the Methodology paragraph 3.3.1 Chapter III.

currently structure applies to the UK, post-Brexit. Although, the government has appointed the Green Technical Advisory Group (GTAG) for the design and implementation of a UK Green Taxonomy criteria, the GTAG has recommended the adoption and expansion of the EU Green Taxonomy for the UK market, by also encompassing the financial and advisory services. The Greening Finance Roadmap was outlined in October 2021, and further decisions are expected to be made later in 2023.³⁷³

2.6.2 Task design

Task design has been differentiated in two concept groups because of the different concerns that these tasks cover to which are also connected the two research questions and related hypothesis. The first concept group include questions related to the three tasks analysing sustainability preferences assessment, evaluation and prioritisation. These has been innovatively constructed because the possible alignment of sustainable investment with the taxonomies has not been previously done.

Questions included in the second concept group, with task four and five, wants to define the climate profile of respondents. Task four of consolidated questions to evaluate loss aversion through the adaptation of climate change of the Li et al.³⁷⁴ scale. Task five introduces a lottery to evaluate respondent discount factor. Desktop research on the thematic of climate change to define investors climate profile consistently with current literature has been run to include further questions on knowledge and scenarios of climate change in the concept two.³⁷⁵ Further details on task

³⁷³ "The 2023 Green Finance Strategy is an update to the UK's 2019 Green Finance Strategy and sets out how continued UK leadership on green finance will cement the UK's place at the forefront of this growing global market, and how we will mobilise the investment needed to meet our climate and nature objectives. Published alongside this Strategy are the UK government's Powering Up Britain, Nature Markets Framework, International Climate Finance Strategy and UK 2030 Strategic Framework for Climate and Nature. Collectively these publications confirm the UK's ambition to address climate and environmental challenges, and the practical steps we are taking to drive progress" Department for Environment Food and Rural Affairs, HM Treasury, Department for Business, Energy and Industrial Strategy and Department for Energy Security and Net Zero, 'Mobilising green investment: 2023 green finance strategy' (Gov.UK, 11 April 2023)

<<https://www.gov.uk/government/publications/green-finance-strategy/mobilising-green-investment-2023-green-finance-strategy>> accessed 22 August 2024. See also paragraph 1.5.1 about the Taxonomy for a comparison of UK and EU Taxonomy.

³⁷⁴ Jin Li, Linlin Chai, Onnolee Nordstrom, Chanchai Tangpong, and Kuo-Ting Hung, 'Development of a Loss Aversion Scale.' (2021) 33(1) Journal of Managerial Issues. 69.

³⁷⁵ Further details on literature review are reported in paragraph 2.6.2.2 and the included Table 2 in chapter II.

construction, appearance and structure is included in the following paragraphs.

Since, the attention check was run by checking the length of compiling the data by respondent, check questions were not included. However, on future research with a larger sample, attention questions such as asking to select a specific answer, or adding a clearly untrue question is high recommended.

2.6.2.1 Sustainability preferences assessment, evaluation, and prioritisation

This paragraph includes the description of a company which results aligned with the six-taxonomy³⁷⁶ objective by running five different economic activities. Different five themes have been identified across descriptions: 1) bio methods, 2) transport, movement of being or goods, connectivity 3) chemical, technological processes, 4) addressing CO2 emissions, 5) energy sector related activities. Bio-methods, chemical, technological processes, CO2 emission abatements were the selected domains after the testing exercise described above (paragraph 2.4.2 Table1).

Task descriptions for each objective in different themes, extracted from the Taxonomy will be then used in task 1 and task 2³⁷⁷ to assess and evaluate sustainability preferences respectively. The dependent variable in the ASSESSMENT task, is calculated as the frequency with which each participant chooses each of the six companies investing into a different environmental objective over all the other companies. In the EVALUATION task, the amount that each participant invests into each of the six companies investing into a different environmental objective will be measured.

The PRIORITISATION task³⁷⁸ will ask to number (from 1 to 6), prioritising the best to the least option of taxonomy objectives, showed to respondent

³⁷⁶Climate neutrality investments can be identified by selecting climate neutral companies, identified by the application of Taxonomies EU 2020/852, and its supplement EU 2021/2139, C 2023/3851, which detail the criteria that qualify an economic activity environmentally sustainable as eligible and aligned. Revenues, CAPEXs and OPEXs of a company are taxonomy aligned only if the activity is eligible - by making a substantial contribution to at least one of the climate and environmental objectives- and by doing no significant harm to the remaining objectives and meeting minimum standards on human rights and labour standards also aligned. See paragraph 1.5, chapter I for more information on the 'Taxonomy', 'Climate Taxonomy' and Environmental Taxonomy'.

³⁷⁷ Described on paragraph 2.6.1.1 and 2.6.1.2 respectively.

³⁷⁸ Described on paragraph 2.6.2.1.3.

in random order to rank of each environmental objective for each participant.

2.6.2.1.1 Sustainability preferences assessment

Question: *Below are described six (6) different eco-friendly actions that a food-producing/processing company may perform. Please rank them according to your preferences (from first place = most favourite, to sixth place = 6 least favourite).*

*The food company contributes substantially to:*³⁷⁹

1. the reduction of greenhouse gas by generating electricity exclusively from biomass, biogas or bioliquids.
2. the reduction of its own climate vulnerability by adopting operation and maintenance practices on its biogas and biofuels facility.
3. the sustainable use and protection of water by operating a facility that treats urban wastewater to filter biodegradable pollution.
4. the transition to a zero-waste economy by operating a facility that utilises bio fuels and treats the resulting bio waste.
5. the prevention and contamination of soil by manufacturing organic and biodegradable products to sourcing ingredients alternatives.
6. the protection of biodiversity by operating programs of nature conservation, restoration and awareness to safeguarding biodiversity.

(Answer options are the choice of ordering the companies, three times out of three domains Bio-methods, chemicals, CO2 emissions). To generate the outcome variable, a ranking score is calculated to identify the most popular environmentally sustainable activity in which the selected companies are investing into (see chapter 3 for detailed explanation on the statistical methodology to be applied).

2.6.2.1.2 Sustainability preferences evaluation

Question: *You have GBP 9,000 to invest in the six (6) different eco-friendly actions. Please fill in the blanks below with the amount of money that you would like to allocate to each of them, thus creating your portfolio strategy. You can invest all the amount in only one action or distribute it as you prefer. You are required to invest it all.*

³⁷⁹ The example for the domain bio-methods is displayed, full questionnaire is available in Appendix I.

(Answer options will have the max of investment of 9000 to be allocated across randomly showed companies with the same definition as task 6.2.1.1). choices evaluation are used to weight the above assessment to calculate a synthetic value including consistency within choices (if the assessment results in A and max investment is on C, choices are inconsistent) (see the analysis plan for detailed explanation on the statistical methodology to be applied on paragraph 3.2.1).

2.6.2.1.3 Sustainability preferences prioritisation

Question: *Please order the six environmental objectives below according to your preferences:*

1. Climate change mitigation
2. Climate change adaptation
3. Sustainable use and protection of water and marine resources
4. Transition to a zero-waste economy
5. Pollution prevention and control
6. Protection and restoration of biodiversity and ecosystems

(Answer options: ordering the items form one -best choice- to six -worse choice of options randomly presented).

2.6.2.2 Secondary outcome variables.

The following table summarises the analysis of existent publications on climate change evaluation to convalidated questions for the climate profile definition of respondents. This to evaluate knowledge and personal impact of climate change. However, after the pre-test, the questionnaire has to be shortened, then the researcher chose to eliminate from the climate profile the knowledge and perception questions, because it is already scientifically defined that these elements does not influence green investment choices significantly.³⁸⁰

In the loss aversion task, loss aversion will be calculated using the loss aversion questionnaire by Li et al., adapted to climate change. The scale measures perception of gains and losses through eight statements on a


³⁸⁰ See paragraph 2.1 Introduction to this chapter and 2.2 for more details on why behavioural economy is important to identify investors' sustainability preferences.

Likert scale from 1-7. Items will be recoded to reflect loss aversion, and the recoded items averaged for each participant.

In the intertemporal choice task, a discount rate for each choice will be calculated as explained in paragraph 2.3 of the following chapter III asking respondents for three discount values of a green investments and then summarising it in only one value to be compared with their sustainability preferences.

Table 2: Literature review of questionnaire on Climate Change knowledge and personal impact

domain general measures	domain	development context	items	subscale	example items
environmental scale (Stern, P. C., Dietz, T., Abel, T., Guagnano, G. A., & Vallet, L. (1999). A value-benefit-norm theory of support for social movements: The case of environmentalism. <i>Human Ecology Review</i> , 21-37)	general	residents USA	5	awareness of consequences consumer behaviour willingness to sacrifice personal normative belief	In general, do you think that climate change, which is sometimes called the greenhouse effect, will be a very serious problem for you and your family, somewhat of a problem for you and your family, or won't really be a problem for you and your family? How often do you avoid buying products from a company that you know may be harming the environment? I would be willing to pay much higher prices in order to protect the environment. I feel a personal obligation to do whatever I can to prevent climate change. Businesses and industries should reduce their emissions to help prevent climate change.
Green Consumption (Kim, S. Y., No, J., Sohn, S. H., Rha, J. Y., Choi, S., Choi, A. Y., & Shin, S. (2012). Toward a composite measure of green consumption: an exploratory study using a Korean sample. <i>Journal of Family and Economic Issues</i> , 33, 199-214)	consumption	residents Korea	5	perceived consumer effectiveness perceived market situation	As one person cannot have any effect upon pollution and natural resource problems, it doesn't make any difference what I do. Green products are too expensive. Credibility Cronbach's $\alpha = 0.78$ 1. Green products are of good quality. 2. I do not believe the production procedures and ingredients of green products. 3. I believe green products are good for my health. 4. I believe green products reduce carbon dioxide emissions. 5. I trust the environmental claims made on packaging labels or in advertising. 6. I trust stores that sell green products. 7. Most of the environmental claims made on packaging labels or in advertising are accurate information availability Cronbach's $\alpha = 0.59$ 1. Most of the environmental claims made on packaging labels or in advertising are confusing. 2. I do not understand meaning of eco-labels. 3. The environmental claims made on packaging labels or in advertising are sufficient. 4. It takes a lot of time to search for information about green products. 5. Accessibility Cronbach's $\alpha = 0.59$ 1. There is no green store nearby. 2. It is difficult to find green products in shops.
Tourists' environmental behaviour (Lee, T. H., Jan, F. H., & Yang, C. C. (2011). Conceptualizing and measuring environmentally responsible behaviors from the perspective of community-based tourists. <i>Tourism Management</i> , 32, 454)	general & tourism	Taiwan	2	financial action persuasive action	buy environmentally friendly products convince someone to buy products packaged in containers that either can be reused or recycled or are made of recycled materials
Tourists' sustainable behaviour (Lee, T.H., Jan, F.H. (2008) Can community-based tourism contribute to sustainable development? Evidence from residents' perceptions of the sustainability. <i>Tourism Management</i> , 29, 168 word questionnaire	general & tourism	Taiwan  Journal of Sustainable Tourism		baseline and post evaluation 15 scale	economic sustainability socio-cultural sustainability environmental sustainability quality of life satisfaction
self-affirmation manipulation Sustainable Behaviour AA-VV. (2014) Encouraging Sustainable Behaviour. Psychology and the Environment Edited van Trijp H.C. M. Psychology Press, Taylor & Francis Group London and New York section 5 Sparks, P., Jenop, D.C., Chapman, J. and Holmes, K. (2010). Pro-environmental actions, climate change, and deforestation: Do self-affirmations make a difference to people's motives and beliefs about making a difference? <i>British Journal of Social Psychology</i> , 49, 553-568. https://doi.org/10.1111/j.1468-0297.2010.01737.x	general	125 UK students		self-affirmation manipulation results	self-affirmation measure was a shortened version of the original Rued and Apsgrubel (1998) 10-items scale reading information on CC environmental ** questions to be added to first author

<p>Yale Project on CC and George Mason Uni Center for CC Communication (2009) Global warming's 5th American audience segmentation analysis https://climatecommunication.yale.edu/wp-content/uploads/2010/07/2009_US_Global-Warming-5th-American.pdf tables page 82</p>	<p>general CC</p>	<p>USA</p>	<p>belief and certainty Risk Perceptions:</p>	<p>Do you think global warming is happening? How sure are you that global warming (happening/not happening) is at risk? Timing of harm to people in... (country) Types of harm Rewarded companies that are taking steps to reduce global warming by buying their products. If the government spent less time trying to fix everyone's problems, we'd all be a lot better off. Environmental Beliefs and Concerns</p>
<p>Willingness to pay - Dankenberg, Ann-Kathrin and Albusen, Hans. On the Determinants of Pro-Environmental Behavior: A Literature Review and Guide for the Empirical Economist (February 21, 2019). Center for European, Governance, and Economic Development Research (CEGER), Number 150, October 2019. http://dx.doi.org/10.2139/ssrn.3373022 PAGE 22 (Skarmetal, 1993 (NO ACCESS); Whitmarsh and O'Neill, 2010; Orono et al., 2010; Hornsey et al., 2010; Hartmann et al., 2017)</p>				<p>Willingness to prioritize environment over economy - Willing to pay much higher taxes in order to protect the environment - Willing to pay much higher prices in order to protect the environment - Willing to accept cuts in standard of living to protect the environment - Willingness to pay extra dollars per year for income tax if the extra money is to be spent to protect the environment - How much increase in gasoline prices, in cents per gallon would you be willing to pay if the money was spent to protect the environment? - Intention to sign up for a residential green electricity contract Support for a tax on carbon dioxide</p>
<p>Willingness to pay: Joanne Orono, Anna Webb, Ben Richardson, The relationship between environmental activism, pro-environmental behaviour and social identity, <i>Journal of Environmental Psychology</i>, Volume 30, Issue 2, 2010, Pages 179-186, https://doi.org/10.1016/j.jenvp.2009.11.005</p>	<p>WTP</p>	<p>students AU university</p>	<p>Factors for pro environmental role</p>	<p>I would be willing to pay much higher taxes in order to protect the environment. I would be willing to accept cuts in my standard of living to protect the environment. I would be willing to pay much higher prices in order to protect the environment.</p>
<p>Willingness to prioritize (Hornsey, M., Harris, E., Bain, P., et al. Meta-analysis of the determinants and outcomes of belief in climate change. <i>Nature Clim Change</i> 6, 623-630 (2016). https://doi.org/10.1038/nclimate2983)</p>	<p>willingness to prioritize environment over economy</p>	<p>meta analysis 20 countries</p>	<p>have only a small relationship with the extent to which people are willing to act in climate-friendly</p>	<p>Willingness to prioritize environment over economy correlation 0.286 (studied 20)</p>
<p>Assessment of warm glow (Patrick Hartmann, Martin Oberst, Vanessa Apaolaza, Clara O'Seoa) Warm glow vs. altruistic values: How important is intrinsic emotional reward in pro-environmental behavior? <i>Journal of Environmental Psychology</i>, Volume 52, 2017, Pages 43-55 https://doi.org/10.1016/j.jenvp.2017.05.005 RESULT: warm glow is the main driver of pro-environmental behavior</p>	<p>altruism</p>	<p>Australian population As with green electric contracts + in depth interviews</p>	<p>questions regarding altruistic personality traits were more consistent than warm glow</p>	<p>have given money to a charity or environmental organization. have given money to a stranger who needed it (pranked me for it)</p>
<p>Sebastian Berger, Annika M. Wijn, Measuring pro-environmental behavior using the carbon emission task, <i>Journal of Environmental Psychology</i>, Volume 75, 2021, 101611, https://doi.org/10.1016/j.jenvp.2021.101611</p>	<p>measuring</p>	<p>online 220 participants amazon turk (USA/R)</p>	<p>behavior more environmentally decreases when financial incentive risk (like we observe a more environmentally</p>	<p>Participants decide to accept/forgo money paired with carbon emissions in two studies part 5  twitter link</p>
<p>Green fund investment (Anderson, Andrew and Robbin on, David T. Climate fears and the Dem and for Green Investment (November 20, 2019). Swedish House of Finance Research Paper No. 19-14. http://dx.doi.org/10.2119/ssrn.3490730</p>	<p>balancing decisions</p>	<p>1000 Swedish</p>	<p>Climate calamities Environmental Engagem Beliefs about Green Investment</p>	<p>"Over the next 20 years, how likely do you find the following scenarios?" Temperature "The average temperature on earth will rise by more than one degree Celsius" Food Shortage "Food shortages will increase" Sea Level "The world sea level will rise by over one meter" Recycling "I recycle a great deal more than my neighbors" Products "I am willing to pay more for environmentally friendly products" Green Returns "Environmental sustainable investments generate higher returns in the long run" Higher Fees "I am willing to pay higher fees for a mutual fund that only make environmentally friendly investments"</p>

2.6.2.2.1 Loss aversion assessment

Question: *Please state how much you agree or disagree with the following eight statements regarding your green investment decisions:*

1. When making a green investment decision, I think much more about what might be lost than what might be gained.
2. The fact that my green investment lost performance matters more than if it earned the same performance.
3. I feel nervous when I have to make a green investment decision that may lead to loss.
4. The pain from losing on a green investment matter much more to me than the pleasure from gaining on it.
5. Avoiding failure of green investments is less important to me than seeking success of green investments.
6. The experience of a major loss on a green investment stays in my mind longer than a major gain.
7. A potential green investment failure scares me more than a potential success encourages me.
8. The disappointment that comes with losses on green investments cannot be offset by the pleasure that comes from gains.

(Answer options: Completely disagree, disagree, somewhat disagree, neither disagree nor agree, somewhat agree, agree, completely agree). To generate the outcome variable the seven Likert scale answer options will be transformed to the numbers 1-7.

2.6.2.2.2 Intertemporal discount evaluation.

Question: *Today you are offered the chance of investing 1000 GBP: please determine the capital value the investment in each of the following years to make you accept the deal.*

EUR XXXX in 2025 from now
 EUR XXXX in 2030 from now
 EUR XXXX in 2050 from now

(Answer options: the lottery will enable the calculation of the discount rate of each respondent calculating his own perceived value of green investments during climate neutrality actions implementation). To generate the outcome variable a discount rate will represent the aggregate values of respondent's answers. The average value of these evaluations over the years, will calculate the respondent discount factor to be confronted with

his own sustainability preferences and risk perception in terms of loss aversion and gain. Data collected from the sub tasks 6.2.2.1 and 6.2.2.2 answers will evaluate the risk perception of climate change as it affects respondents. This value will help in the definition of the present bias of the respondent as his willingness to act against climate change because sensitive to the issue.

2.6.3 Limitations

The current sample, focussing on young adults, may not adequately represent broader populations, limiting the study external validity, when generalizing the findings. Also, the analysis of variable correlations will benefit from a larger sample, demographically and geographically more distributed, because disentangling the effect of complex causal relationships if any.

The attention check run for this research, checking the time respondent took to reply, would not be possible if a larger sample is addressed. The use of specific platforms, such as Prolific, will allow the consistency of the sample and replies without the need of adding check questions. This research did not have the possibility of having the financing to use a specific platform outside the University one³⁸¹.

2.7 CONCLUSIONS

Behavioural economics assumes that individual's reaction to specific situations or incentives is predictable. Then policies based on behavioural economics principles shall not disadvantage individuals or groups who do not respond as anticipated³⁸². That's why some policymakers prefer to

³⁸¹ *A partnership for the dissemination to thousands of members of the association Rewired Earth was stipulated. Nevertheless, for a technical problem of the association, the questionnaire was disseminated, but replies were not recorded.*

³⁸² Vera Rita De Mello Ferreira, 'Can Economic Psychology and Behavioural Economics Help Improve Financial Education?' in *Improving Financial Education Efficiency. OECD key findings and way forward* 61 (OECD 2013) <https://web-archiver.oecd.org/2016-06-30/408393-Improving_Fin_Ed_effectiveness_through_Behavioural_Economics.pdf> accessed 9 July 2024.

promote responsible financial behaviour through tailored strategies rather than adopting a one-size-fits-all approach³⁸³.

Then the EU legislative measures - implemented and being developed- address multiple areas, “by establishing a common language, broadening the scope of market participants (for instance, by explicitly involving distributors of financial products, who have previously been less engaged than institutional investors), reviewing existing regulations based on practical experience (as seen with non-financial reporting), and introducing new transparency and conduct guidelines”³⁸⁴. However, the application of the above selected principles and concepts of behavioural economics to the suitability assessment of sustainability preferences can further enhance financial investor protection from regulators, policy-makers and supervisors by designing more effective tools to enable the financial advisor to select and recommend the most suitable financial instrument to the client.

MiFID II mandates that information shall be presented in a clear and understandable manner, enabling clients or potential clients to reasonably grasp the nature and risks of the investment service and the specific type of financial instrument being offered, thereby allowing them to make informed investment decisions³⁸⁵. However, decisions depend, as for the above analysis, not only on information, but on several factors, such as information load, quality and complexity as well as on information framing and cognitive biases, such as risk aversion, to these. All factors that could influence investors behaviour in creating unexpected investment outcomes

Furthermore, clients must be timely informed about the investment firm and its services, the financial instruments and proposed investment strategies, the execution venues, and all associated costs and charges³⁸⁶. Then to further protect investors with limited cognitive abilities, EU regulators have introduced, to complement the MiFID II suitability test, the requirement, that product manufacturers and distributors need to thoroughly understand all product features and determine which types of

³⁸³ Vera Rita De Mello Ferreira, ‘Can Economic Psychology and Behavioural Economics Help Improve Financial Education?’ in *Improving Financial Education Efficiency. OECD key findings and way forward* (OECD 2013) <https://web-archive.oecd.org/2016-06-30/408393-Improving_Fin_Ed_effectiveness_through_Behavioural_Economics.pdf> accessed 9 July 2024.

³⁸⁴ Claudia Guagliano, Nadia Linciano, Paola Soccorso, ‘Chapter 11 Conclusions’ in Nadia Linciano, Paola Soccorso and Claudia Guagliano (Eds) *Information as a Driver of Sustainable Finance the European Regulatory Framework* (Palgrave Macmillan 2022) 327.

³⁸⁵ Article 24(5) ‘MiFID II’.

³⁸⁶ Article 24(4) ‘MiFID II’.

clients these products would be compatible with³⁸⁷. This to prevent products from being sold or recommended to investors for whom they are not intended to³⁸⁸. Therefore, Financial Market Participants (FMPs) use, to support client choices other information to be added to the ones requested and collected through the suitability assessment. Information, which belongs to the market and/or to the financial institution, through which the advisor and portfolio manager, shape the financial offer to the client. Through this information the FMPs can influence the choices of investors towards a better choice for them³⁸⁹ guiding also investors which show a neutral behaviour, towards risk aversion and a consistent risk evaluation for present and future choices.

As a matter of fact, the Commission commissioned study on disclosure and suitability rules for retail investors,³⁹⁰ reported that, available and accessible and clearly presented information did not result in increasing usefulness for product comparison or understanding if investors are not interested, engaged and financially literate, thenceforth able to use these documents as a tool that allows them to make comparisons. This showed that disclosure had a limited impact on supporting investors to make the right decision. Special techniques have also been employed to analyse financial product information. One of these techniques extract textual characteristics based on various syntax measures (e.g., sentences, words, syllables) from the product information files to automate information processing,³⁹¹ funding that product information provided in both Simplified Prospectuses (SPs)³⁹², Key Information Document (KID) and Key Investors Information Documents (KIIDs)³⁹³ is far too complex to read and

³⁸⁷ Barbara Alemanni, 'Retail Investors' Attitude and Preferences and Sustainable Investing Regulation' in Nadia Linciano, Paola Soccorso and Claudia Guagliano (Eds) *Information as a Driver of Sustainable Finance the European Regulatory Framework* (Palgrave Macmillan 2022).

³⁸⁸ Barbara Alemanni, 'Retail Investors' Attitude and Preferences and Sustainable Investing Regulation' in Nadia Linciano, Paola Soccorso and Claudia Guagliano (Eds) *Information as a Driver of Sustainable Finance the European Regulatory Framework* (Palgrave Macmillan 2022).

³⁸⁹ See discussion on smart and smarter default paragraph 3.5.1.

³⁹⁰ European Commission Directorate-General for Financial Stability, Financial Services and Capital Markets Union, Daniela Uličná, Máté Vincze, Marius Mosoreanu, Maxime Hayet, Raphaël de Landsheer, Osmo Järvi, Véronique Bruggeman, Julija Sproge, Sarah Fialon, Willem Pieter De Groen, Cosmina Amariei, Inna Oliinyk and Jelmer Nagtegaal, *Disclosure, inducements, and suitability rules for retail investors study. Final report* (European Union 2023).

³⁹¹ Such as state-of-the-art textual analysis methods included in Python's NLTK.

³⁹² Council Regulation (EU) 1129/2017 of 14 June 2017 on the prospectus to be published when securities are offered to the public or admitted to trading on a regulated market, and repealing Directive 2003/71/EC [2017] OJ L 168/12. Par 32. See paragraph 2.3.1 on Information disclosure for more information.

³⁹³ Regulation (EU) 583/2010 of 1 July 2010 implementing Directive 2009/65/EC as regards key investor information and conditions to be met when providing key investor information or the prospectus in a durable medium other than paper or by means of a website. [2010] OJ L 176/1. See paragraph 2.3.1 on Information disclosure for more information.

understand for its addressees and requires at least university education³⁹⁴. Complexity affects investors behaviour because of the heuristic biases, by implementing quick shortcuts leading to approximate answers. Furthermore, decisions depend also on investors' risk propensity or aversion, which influences investment choices, often deviating from purely rational financial behaviour.

Since investment decisions depend on how information is framed, disclosure alone is not always effective.³⁹⁵ Investor protection can be improved by integrating bias-mitigation strategies into sustainability preference assessments. By understanding investors' sustainability preferences, financial advisors can guide clients towards suitable investment choices. A structured choice architecture framework—incorporating behavioural nudges—can support this process³⁹⁶. In fact, a thoroughly understanding of investors' sustainability preferences can support the best client decision, but both the use of the suitability assessment together with the overall information FMPs possess. A green investment default can be suggested as a policy tool to encourage sustainable finance, aligning with investor preferences and positively steering investors' behaviour towards suitable solutions because easy to access and easy to avoid with no, or small cost, and close to the status quo and can further enhance financial investor protection from regulators, policymakers and, supervisors through the design of more effective tools to enable the financial advisor to select and recommend the most suitable financial instrument to the client.

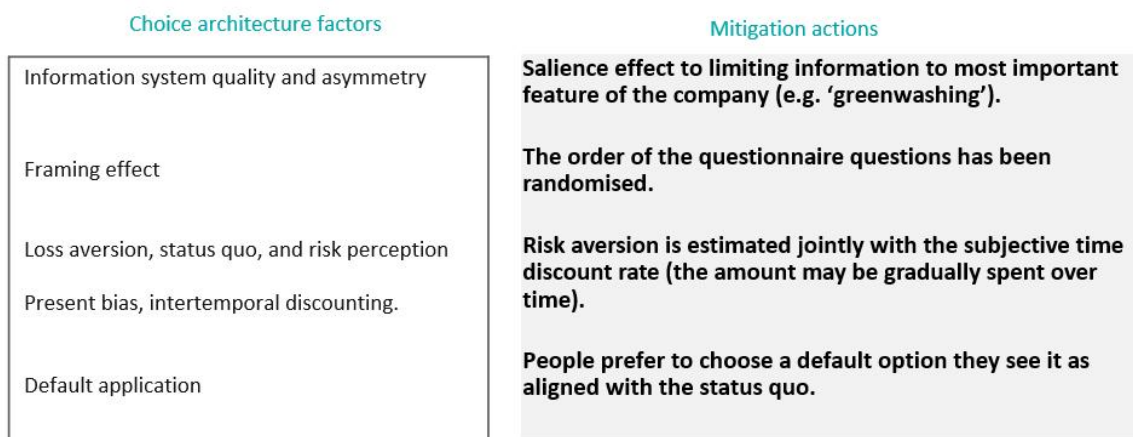
Then a structured choice architecture framework (Fig.2) has been built to include all these elements in the application instrument of a questionnaire for sustainability assessment based on the understanding of investors' behavioural biases. Starting from the application of the salience and framing of information for sustainability assessment, evaluation and prioritisation, the questionnaire also values and mitigate investors' risk perceptions for green investing through the behavioural proxy of loss aversion and intertemporal discount, considering that behavioural

³⁹⁴ Dominik Scheld, Oscar Stolper and Andreas Walter, 'Double Dutch Finally Fixed? A Large-Scale Investigation into the Readability of Mandatory Financial Product Information' (2021) 44 (2) *Journal of consumer policy* 151. The importance of education of forming and guiding investors' understanding is analysed in paragraph 2.3.1.

³⁹⁵ Barbara Alemanni, 'Retail Investors' Attitude and Preferences and Sustainable Investing Regulation' in Nadia Linciano, Paola Soccorso and Claudia Guagliano (Eds) *Information as a Driver of Sustainable Finance the European Regulatory Framework* (Palgrave Macmillan 2022).

³⁹⁶ See paragraph 2.2 for general introduction of behavioural economics and paragraphs 2.3 and 2.4 of this chapter for the detailed information summarised in figure 1.

economics factors are applied assuming that individual's reaction to specific situations or incentives is predictable.



Source: elaborated by the author

Figure 1: Behavioural economic insights relevant for financial services

As explained above, the proposed scheme supports the creation of a green default nudge³⁹⁷, which can also be considered a smart default when introduced at the beginning of the decision-making process. By guiding investors toward more suitable investment choices, this approach helps them make better decisions than they might on their own. This concept is particularly relevant in the investor-financial advisor relationship, where information asymmetry plays a significant role. Since advisors often have a deeper understanding of financial products and market dynamics than investors do.

A smart default can become even smarter, when structured by adapting to other information – for instance bank's information not related to client's risk profile such as age, gender, shopping habits etc. - provided by the investor as part of the decision-making process, to improve personalisation. By increasing nudge³⁹⁸ customisation and closeness to the status quo

³⁹⁷ For definition and description of nudge see paragraph 2.2 of this chapter II. The creation of the green default based on the questionnaire fundings is described on paragraph 3.5 Chapter III of this research.

³⁹⁸ See paragraph 2.3.5 of this chapter II for more detail on default analysis.

(investor determined financial profile)³⁹⁹, through the application of behavioural economics mechanisms, protection of the investors will move a step forward through the selection of the most suitable financial instrument adapted to investor sustainability preferences enabling the implementation of policies promoting financial consumer protection⁴⁰⁰. Furthermore, the enhanced process of decision making for sustainability will also improve awareness and understanding of ESG financial products encouraging ESG financial literacy⁴⁰¹.

³⁹⁹ For details on default implementation see paragraph 2.4.5 of this chapter II.

⁴⁰⁰ Anne-Françoise Lefevre and Michael Chapman, 'Behavioural economics and financial consumer protection' (2017) OECD Working Papers on Finance, Insurance and Private Pensions, 42 < <https://doi.org/10.1787/Oc8685b2-en> > accessed 09 July 2024.

⁴⁰¹ See paragraph 2.3.1 for more explanation on financial education for sustainability implementation.

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APPENDIX I QUESTIONNAIRE

Welcome to this assessment of Green Decision Making.

1. What is the purpose of the project? The purpose of this study is to collect people behavioural data in choosing investments in green business activities. The survey is divided in four tasks: First, the choice among six different eco-friendly business actions that you should rank for three times according to your preferences. Then, the portfolio allocation on these activities, assuming you have 9,000 GBP to invest. In a second task you should rank six general environmental and climate objectives. And in the third task, you are asked to express your agreement level against eight statements that reflect your aversion to losses. In the final task, your personal value of time is enquired. The survey takes approximately 15 minutes to complete and is fully anonymous. Basic contextual data (age, education, and gender) are collected. Before starting, you will be asked to give your Informed Consent. Upon completion you will receive a debrief. We recommend that you fill in the survey on your own and in a quiet place. Thank you for your participation.
2. Who can be a participant? To participate, you must be 18 years of age or above and be fluent in English.
3. Do I have to take part? It is completely up to you to decide if you would like to participate. You are free to withdraw at any point in the survey without giving a reason by simply closing the webpage. If you have any questions, please do not hesitate to send an email to the principal investigator, Luisa Nenci (luisa.nenci@iusspavia.it), and/or the supervisors: Dr Janina A. Hoffmann (University of Bath, United Kingdom), Prof. Lorraine Whitmarsh (University of Bath, United Kingdom), Prof. Eugenia Macchiavello (University of Genoa, Italy).
4. What are the possible benefits, risks, and disadvantages of taking part? This study will provide respondents with insight into the value of their sustainability choices for green businesses. Participating in the research is not anticipated to cause you any disadvantages or discomfort.
5. Who will have access to the information that I provide? Only the research team will have access to the information that you provide, and all the data is anonymous.
6. What will happen to the data collected and results of the project? No personally identifiable information will be collected during this study, meaning you cannot be identified from the data collected. The data will be treated as confidential and kept on the University of Bath secure servers, which are encrypted and password protected. Recorded data will be kept for 10 years. Your rights to access, change, or move your information are limited, as we need to manage your information in specific ways for the research to be reliable and accurate. Once anonymized, we will not be able to delete your data.
7. Who has reviewed the project? This project has been reviewed and approved by the University of Bath, Department of Psychology Research Ethics Committee. Ethical approval code: 1826-3832.

8. What happens if there is a problem? If you have a concern about any aspect of the project, please contact the researchers or the Psychology Research Ethics Committee (psychology-ethics@bath.ac.uk). You may wish to print out this participant information for your own records.

Consent form:

I have read the Participant Information Sheet above and have had the opportunity to consider the information and ask questions about my participation in advance. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. I understand that the anonymised data collected about me will be used to support other research in the future, may be shared with other researchers, may provide advice to future participants, and will be made available on a public data repository once the results of the study are published.

I agree to take part in the above study.

By checking this box, I agree with all of the above.

Below are described six (6) different eco-friendly actions that a food-producing/processing company may perform. Please rank them according to your preferences (from first place 1 most favourite, to sixth place 6 least favourite). The food company contributes substantially to:

- the reduction of greenhouse gas by generating electricity exclusively from biomass, biogas or bioliquids.
- the reduction of its own climate vulnerability by adopting special operation and maintenance solutions on its bioenergy facility.
- the sustainable use and protection of water by operating a facility that treats urban wastewater to filter biodegradable pollution.
- the transition to a zero-waste economy by operating a facility that utilises biofuels and treats the resulting bio waste.
- the prevention of pollution by manufacturing organic and biodegradable products to sourcing ingredients alternatives.
- the protection of biodiversity by operating programs for nature conservation, restoration and awareness on bio-economy.

You have GBP 9,000 to invest in the six (6) different eco-friendly actions. Please fill in the blanks below with the amount of money that you would like to allocate to each of them, thus creating your portfolio strategy. You can invest all the amount in only one action or distribute it as you prefer. You are required to invest it all.

- the reduction of greenhouse gas by generating electricity exclusively from biomass, biogas or bioliquids.
- the reduction of its own climate vulnerability by adopting special operation and maintenance solutions on its bioenergy facility.

- the sustainable use and protection of water by operating a facility that treats urban wastewater to filter biodegradable pollution.
- the transition to a zero-waste economy by operating a facility that utilises bio fuels and treats the resulting bio waste.
- the prevention of pollution by manufacturing organic and biodegradable products to sourcing ingredients alternatives.
- the protection of biodiversity by operating programs for nature conservation, restoration and awareness on bio-economy.

Below are described six (6) different eco-friendly actions that a food-producing/processing company may perform. Please rank them according to your preferences (from first place 1; most favourite, to sixth place 6; least favourite). The food company contributes substantially to:

- the reduction of greenhouse gas emissions by producing organic chemicals from agricultural and forestry residuals.
- the reduction of climate vulnerability by adopting bioremediation actions and nutrient recycling in its production.
- the sustainable use and protection of water by operating an urban drainage system that removes hazardous chemicals.
- the transition to a zero-waste economy by manufacturing product packaging from recycled, non-chemical raw materials.
- the prevention of pollution by sourcing organic products as an alternative to chemical ingredients.
- the protection of biodiversity by actively contributing to nature conservation by avoiding indirect harm such as chemical pollution littering.

You have GBP 9,000 to invest in the six (6) different eco-friendly actions. Please fill in the blanks below with the amount of money that you would like to allocate to each of them, thus creating your portfolio strategy. You can invest all the amount in only one action or distribute it as you prefer. You are required to invest it all.

- the reduction of greenhouse gas emissions by producing organic chemicals from agricultural and forestry residuals.
- the reduction of climate vulnerability by adopting bioremediation actions and nutrient recycling in its production.
- the sustainable use and protection of water by operating an urban drainage system that removes hazardous chemicals.
- the transition to a zero-waste economy by manufacturing product packaging from recycled, non-chemical raw materials.
- the prevention of pollution by sourcing organic products as an alternative to chemical ingredients.
- the protection of biodiversity by actively contributing to nature conservation by avoiding indirect harm such as chemical pollution littering.

Below are described six (6) different eco-friendly actions that a food-producing/processing company may perform. Please rank them according to your preferences (from first place 1; most favourite, to sixth place 6; least favourite). The food company contributes substantially to:

- the reduction of greenhouse gas emissions (GHG) by restoring wetlands and forestlands and creating new carbon sinks.
- the reduction of its own climate vulnerability by operating and maintaining infrastructure that permanently stores CO₂.
- the sustainable use and protection of water by adopting best available techniques (BAT) to treat wastewater and reduce related GHG emission.
- the transition to a zero-waste economy by buying second-hand company vehicles that are compliant with specific CO₂ emission targets.
- the prevention of pollution by adopting integrated and end-of-pipe technologies that reduce CO₂ emissions.
- the protection of biodiversity by re-establishing or restoring degraded ecosystems that are net GHG emitters.

You have GBP 9,000 to invest in the six (6) different eco-friendly actions. Please fill in the blanks below with the amount of money that you would like to allocate to each of them, thus creating your portfolio strategy. You can invest all the amount in only one action or distribute it as you prefer. You are required to invest it all.

- the reduction of greenhouse gas emissions (GHG) by restoring wetlands and forestlands and creating new carbon sinks.
- the reduction of its own climate vulnerability by operating and maintaining infrastructure that permanently stores CO₂.
- the sustainable use and protection of water by adopting best available techniques (BAT) to treat wastewater and reduce related GHG emission.
- the transition to a zero-waste economy by buying second-hand company vehicles that are compliant with specific CO₂ emission targets.
- the prevention of pollution by adopting integrated and end-of-pipe technologies that reduce CO₂ emissions.
- the protection of biodiversity by re-establishing or restoring degraded ecosystems that are net GHG emitters.

Please order the six environmental objectives below according to your preferences:

- Climate change mitigation
- Climate change adaptation
- Sustainable use and protection of water and marine resources
- Transition to a zero-waste economy
- Pollution prevention and control
- Protection and restoration of biodiversity and ecosystems

Today you are offered the chance of investing 1000 GBP: please determine the desired capital value of the investment in each of the following years to make you accept the deal.

2025	<input type="checkbox"/>
2030	<input type="checkbox"/>
2050	<input type="checkbox"/>

Age

Years	<input type="checkbox"/>

Sex

- Female
- Male
- I prefer not to say

Education

- Undergraduate
- Graduate
- Postgraduate
- I prefer not to say

APPENDIX II ETHICS REFERENCE



Research Governance and Compliance

Vice-Chancellor's Office

University of Bath

Bath BA2 7AY

01/03/2024

Dear Ms Luisa Nenci

Ethics application reference number: 1826-3832

Project title: Investors' Green Decision Making

The above application has been considered by the Social Sciences Research Ethics Committee.

Please accept this letter as confirmation that the application has been given a **favourable opinion** on behalf of the committee. This favourable opinion is in place for/until 01/11/2024.

You can view the application and any comments here: <https://ethics.bath.ac.uk/Project/Index/1840>

The documents reviewed by the committee were:

The project may now commence in line with application documents above.

Document Type	File Name	Date	Version
C1.5 Recruitment materials	Email_example	28/10/2023	1
C2.5 Consent forms	Consent_Form_Example	28/10/2023	1
H1 Other documentation	Doctoral_Data_Management_Policies	30/10/2023	1
C1.7 Participant information sheets	information.sheet_revised	01/11/2023	2
C3.7 Debriefing materials	Debrief_Sheet_Example.1	19/02/2024	2
H1 Other documentation	Draft Questionnaire 19.02.2024	19/02/2024	new version

Should your research require any other approvals (e.g. export control licences, visas, DBS, letters of access/comfort, country specific requirements, etc) please ensure that they are all in place before your project starts.

If there are any changes to this project (including amendments to the design, sample, or start/end dates etc.), you will need to submit an amendment via the online system.

If you have any queries, please contact: social-science-rec@bath.ac.uk

Kind regards,

Dr Jacob Barker

Committee Secretary

On behalf of the Social Sciences Research Ethics Committee

CHAPTER 3



***Sustainability preferences assessment
of a sample of young adults.***

3 SUSTAINABILITY PREFERENCES ASSESSMENT OF A SAMPLE OF YOUNG ADULTS

3.1 INTRODUCTION

The current regulatory framework⁴⁰² for sustainable finance is mandating the assessment and evaluation of investors' sustainability preferences through the suitability assessment. Criteria have been established to define what shall be disclosed as green⁴⁰³ and a questionnaire recommended to collect this information.⁴⁰⁴ Financial institutions comply with these norms to include in the suitability assessment report the justification on how the selected green financial instrument suggested to the investor meet her/his sustainability preferences, by including from one to 69 questions⁴⁰⁵ for sustainability evaluation in the suitability assessment.⁴⁰⁶ Then this research considered the possibility of making a well-designed questionnaire, which should be valid, reliable, clear, concise, and engaging. To include behavioural economics factors mitigation actions, a conceptual framework has been created⁴⁰⁷, against which each question has been carefully evaluated for relevance and clarity, to create a convalidated questionnaire. This chapter describe the conducted analysis of respondents' data.

This analysis aims to assess respondent choices showing different types of sustainability preferences depending on the company's environmental objective. Then the frequency of investments and preferences on portfolio allocation across companies (investing in each objective) will be evaluated together with the prioritisation of these environmental objectives.

Then the analysis purposes to identify individual characteristics of investors which may affect sustainability preferences, such as correlation of sustainability preferences (how often and how much investors are willing to invest) for mitigation (and other environmental objectives) i) with loss aversion ii) with discount rate; iii) with investors distribution of their investments across

⁴⁰² See chapter I for more details on the legal framework for the suitability assessment.

⁴⁰³ See paragraph 1.5 for details on the 'Taxonomy' and paragraph 1.4 the 'SFDR' of chapter I.

⁴⁰⁴ European Securities and Market Authority, 'Final Report Guidelines on certain aspects of the MiFID II suitability requirements' (ESMA 2022) 35-43-3172.

⁴⁰⁵ Francesco Adria, Nadia Linciano, Francesco Quaranta, and Paola Soccorso, 'Profilazione della clientela ai fini della valutazione di adeguatezza. Follow up dello studio del 2012 su un campione di intermediari italiani' (2022) CONSOB Discussion Papers 11/2022, 7 <<https://www.dirittobancario.it/wp-content/uploads/2022/11/Discussion-Paper-Consob.pdf>> accessed 10 February 2024.

⁴⁰⁶ For more information on the Suitability assessment see paragraph 1.6.5 of chapter I.

⁴⁰⁷ See paragraph 2.4 and 2.7 conclusions of chapter II for conceptual framework design with the implementation of behavioural bias mitigation.

objectives and loss aversion correlation; and iv) with correlation of loss aversion for green investments and discount factor.

Furthermore, based on the above results some policy and regulation implications for possible application of the selected behavioural mitigation bias are discussed, the possible implementation of the questionnaire in the MiFID II suitability assessment is considered and conclusions drafted.

Following this introduction, paragraph two describes the structured model used to pattern investors sustainability preferences and climate change risk perception, and related identified variables. Paragraph three illustrates the employed research methods, including the survey data collection, analytics and statistical techniques. While paragraph four presents the study results, and paragraph six, after some conclusions, introduces a discussion on their relevance to the existing sustainable finance legislation, including a guideline proposal for a possible questionnaire to be implemented in the suitability assessment. With the final aim of helping financial advisors and portfolio managers to better understand investors sustainability preferences and motivations to gain better support on reaching the green deal climate neutrality objective; this research wants also provide policy makers with better design instrument for climate policies that are both effective and politically acceptable to citizens. The inclusion of behavioural bias mitigation techniques shall increase investor protection by enhancing the real definition of their preferences. By actively acknowledging and incorporating clients' green values and interests in a customised financial instrument that will really represent clients' preferences, then the product-oriented approach will become closer to the client-oriented model adopted by the EU⁴⁰⁸.

3.2 UNDERSTANDING SUSTAINABILITY PREFERENCES AND CLIMATE CHANGE PERCEPTION

3.2.1 Understanding Types of Sustainability Preferences

Investors' sustainability preferences fulfilment consists in the identification of an adequate financial instrument also from a sustainability point of view within a range of financially suitable products identified according to the client profile risk suitability. Then which sustainable economic activity – as identified by the taxonomy- does investor prefer to invest in and in which amount, among mitigation, adaptation, sustainable use and protection of water, the transition

⁴⁰⁸ See footnotes n.34 and 101.

to a zero-waste economy, pollution prevention and control, and protection and restoration of biodiversity and ecosystems, is what questions want to identify. There are manufacturers dedicating resources to an identified mitigation action, others selecting adaptation activities (identified in the analysis as company A and B), and four more companies engaged in the environmental economic actions of sustainable water use, circular economy, pollution prevention and biodiversity protection respectively (nominated C, D, E, F). Investors' preferences for the six taxonomy objectives are also calculated through ranking questions. While a portfolio amount of 9000⁴⁰⁹ British Pounds is distributed to the companies as above described. Selections are randomly presented.

3.2.2 Understanding Perceptions of Climate Change

The investor's perception on losses and gains and value of time may influence investor's preferences for different company-level sustainability actions and capital allocation choices. For example, a respondent with high loss aversion will make more conservative and prudential investment choices which normally correspond to a high discount rate which discourage investments with long term benefits (e.g., wetland restoration) because of an increased volatility in future cash flows. This normally led to the support of investments, which by addressing current impacts create short-term benefits, significant long-term costs (e.g., damming rivers) but have a low present value today.

Questions will evaluate perception of gain and losses due to climate change, and with a lottery, where respondents will express their value for a green investment in the short and longer term (until the milestone of climate neutrality is reach in 2050) their discount rate. The average value of these evaluations over the years, will calculate the respondent discount factor to be correlated with his own sustainability preferences to confront revealed preferences with climate risk perception and evaluation.

While discount rate and loss aversion are separate concepts, they can interact in decision-making, with the following effects:

- Combined. It highlights the combination of respondents' high discount rate (then preferences for immediate rewards) with high loss aversion. This can assume impulsive decisions leading to avoid immediate losses over long-

⁴⁰⁹ See paragraph 2.4.2 of chapter II framing effect and heuristic bias mitigation for more theoretical information.

term gains, such as an example, avoiding investing in risky stocks for potential loss even if the likely long-term returns are high.

- Mitigated. It shows a low discount rate (patience for delayed rewards), which moderates loss aversion effects, such as be willing to take calculated risks for potential long-term gains, even if there is a risk for short-term losses.
- Individual Differences. These indicate both, people, who may be highly patient but also extremely loss-averse, and impatient people but risk-tolerant.

Correlation of data will value these possible combinations in the paragraphs below.

3.2.3 Variables Hypothesized to Describe Preferences and Risk Perception.

This study couldn't draw from previous questionnaires⁴¹⁰ for sustainability assessment and evaluation questions. Then the conceptual model, discussed in the previous chapter used to build the questionnaire, will be tested through the analysis included in this chapter. This paragraph identifies the framework of potential dependent variables that may be associated with the taxonomy objectives for sustainability preferences definition and for different level of portfolio allocation and risk.⁴¹¹ the established framework used to inform on the first research objectives, that is, to improve the understanding of sustainability preferences, and the second, which confronts them with climate change perceptions to provide the financial sector advisor, portfolio managers and policy makers with the possibility to nudge investors towards green investments.

Sustainability preferences are a dependent variable (Y), which contains three information: the preference itself (the singular choice of the individual investor, namely the company-level sustainability action) and the breadth (intensity) of the preference (namely the amount of GBP invested into it and the absolute choice of the environmental sustainable objective in which to invest). It is also possible to assess the consistency of the investment choice (i.e. if the investor is coherent – s/he will allocate the largest sums to the most preferred actions – but it may be the case that the investor makes apparently irrational choices – investing larger sums to actions that have been ranked lowly).

⁴¹⁰ See paragraph 2.6.2.2 of chapter II for more details on the literature review.

⁴¹¹ See also paragraphs 3.3.2 statistical analysis and 3.2.3 variable hypothesized for more information on calculations.

In the ASSESSMENT task, preferences are calculated as the frequency with which each participant chooses each of the six companies investing into a different environmental objective over all of the other companies.

In the EVALUATION task, preferences are measured as the amount that each participant invests into each of the six companies investing into a different environmental objective.

In the PRIORISATION task preferences are ranked through the choice of environmental objectives by each participant.

Loss aversion (LA) and discount rate (dr) are the independent variables (X) or predictors. Risk aversion is estimated jointly with the subjective time discount rate because the investment evaluation does not only depend on the absolute amount of gains or losses but also on the way in which the amount may be gradually spent over time.⁴¹² Then, general risk aversion cannot be independently estimated from lottery questions, except in cases involving very small prizes (which are not subject to careful evaluation. Although what can be defined as small it depends on the personal conditions of the respondent).⁴¹³

In the loss aversion task, we will calculate loss aversion using the loss aversion questionnaire by Li et al., adapted to climate change. The scale measures perception of gains and losses through 8 statements on a Likert scale from 1-7. Items will be recoded to reflect loss aversion, and the recoded items averaged for each participant.

In the intertemporal choice task, a discount rate for each choice will be calculated. Lottery questions are open to write an amount which is contextualised (not going negative and with a maximum equal to the total amount to be spent) is an efficient way to reduce the response effort as respondent will not take much time to think because it is a difficult question people do not usually ask them self.⁴¹⁴

Contextual control variables of the respondents like age, education level and gender are also used.

⁴¹² Bernard van Praag and Adam S. Booj, 'Risk Aversion and the Subjective Time Discount Rate: A Joint Approach.' (2003) Cesifo Working Paper 923/10, 4
<<https://ssrn.com/abstract=396563> or <http://dx.doi.org/10.2139/ssrn.396563>> accessed 24 September 2024.

⁴¹³ Bernard van Praag and Adam S. Booj, 'Risk Aversion and the Subjective Time Discount Rate: A Joint Approach.' (2003) Cesifo Working Paper 923/10, 4
<<https://ssrn.com/abstract=396563> or <http://dx.doi.org/10.2139/ssrn.396563>> accessed 24 September 2024.

⁴¹⁴ Bernard van Praag and Adam S. Booj, 'Risk Aversion and the Subjective Time Discount Rate: A Joint Approach.' (2003) Cesifo Working Paper 923/10, 4
<<https://ssrn.com/abstract=396563> or <http://dx.doi.org/10.2139/ssrn.396563>> accessed 24 September 2024.

3.3 METHODS: DATA COLLECTION AND ANALYSIS

3.3.1 Survey data and measurement

The survey was disseminated online in the UK through the network of the University of Bath. The sample includes a large distribution of young people which represents investors who with their decisions will guide the future of our planet. All respondents in the sampling frame had an equal chance of being selected. A total of 523 people received and viewed with a total of responses of 241. Sixty-eight answers were removed due to incomplete responses, leaving a total of 178 for the nationwide sample.

Table 3: Demographic characteristics of survey sample (n=178)

Sample	%
<i>Gender</i>	
Female	83.1
Male	12.9
Prefer not to say	1.7
N/A	2.2
<i>Age</i>	
18-23	87.1
24-28	3.4
29-35	2.7
N/A	6.7
<i>Education</i>	
Undergraduate	87.1
Graduate	2.2
Postgraduate	7.9
I prefer not to say	0.6
N/A	2.2

Source: elaborated by the author

3.3.2 Statistical Analysis

This study employed the R software (version 4.3.2) and MS Excel to perform all statistical analyses.⁴¹⁵

⁴¹⁵ Project registered on 2 August 2024 on the Open Science Framework (OSF) with code BP4CT at <https://doi.org/10.17605/OSF.IO/BP4CT>

First, descriptive statistics were used to assess sustainability preferences by collecting respondents' choices of three companies supporting different hypothetical climate actions each related to a taxonomy objective implemented in three distinctive domains, such as bio-methods, chemicals and CO2 emissions abatement. Choices have been extracted and raw data prepared for the analysis by cleaning it and organizing an excel database, to display respondents' choices, calculate choices summation and consistency of choices (Hypothesis 2.a). The use clustering algorithms, such as K-means or hierarchical, was performed to represent heterogeneity across the sample, according to similarities in participants' choices based on standardised sustainability preferences. The final thematic definitions that emerged from these clusters are visualised on Table 2

Then the dataset fed into the analysis software (MS Excel and R) to correlate data with environmental objective prioritisation (H2.b), which orders the most preferred environmental objectives, in terms of absolute votes and consistency-adjusted votes (by weighting preferences with amount invested). This to capture the double information of the dependent variable on sustainability preference. Each preference is weighted with weights given by (a transformation of) the amounts invested into it and confronted by correlation function to the prioritisation of the objective preference showed by the respondent. The calculated aggregation of individual sustainability preferences is to be correlated with H2 a and b results (LA and dr) below.

For a second step analysis. Rough survey data from the Likert scales are transformed as following:

- I. Row total of the Likert values (simple sum) Transformed in a negative-positive scale from -3 to +3. Total values of LAF span from -15 to +18.
- II. Z-score of the obtained values (standardization) of data around the standard deviation (z-score equal to zero is the mean). In fact, in the case of average calculation, data are close to zero (neither agree/nor disagree), while in case of summary of data used with z-score data are distributed with a variance of 1.

Thirdly the discount rate (dr) is calculated using the MS Excel built-in solver function (objective function method which null the present value calculated as the summation of the discount rates at each point of time, such as: $dr_1+dr_2+dr_3+dr_4+dr_5$ minus initial capital equal to zero. The function adopts an iterative process to seek the rate that null the net present value of the investment. First step is to assign a theoretical discount rate (this can be between 0 and 1, in this case equal to 0.5) and calculate five discount factors

(one per selected time) and its related discounted cash flow. Then, the five discounted cash flows are summed up and the initial invested capital is subtracted, this is the net present value. Finally, through the solver function the net present value is made equal to zero, and by controlling the initial theoretical dr , the solver automatically finds the real dr that nulls the net present value.

Inter-variables correlations are calculated within sustainability preferences and LA and dr to identify the direction and strength of the correlations.

3.4 RESULTS

3.4.1 Pilot Test

A pilot study, which comprised 161 questions, with 76 combinations pairing companies investing in six environmental objectives and five different green domains, divided into five tasks, underwent with a sample of 55 university students of which 37 completed the questionnaire with a 35-minute average time.

3.4.1.1 Sustainability Preferences Assessment and evaluation

Results, of investor's support for companies investing in environmentally sustainable taxonomy-aligned economic activities from survey data collected from a sample of UK investors ($n = 37$), indicate that mitigation objective (identified by the company A) received the high levels of support (20,74% of responses), while sustainable use and protection of water and marine resources (company C) was equally voted as the transition to a zero-waste economy (company D) scoring both at 17,55%. Is the protection and restoration of biodiversity and ecosystem objective (company F) that received the lowest levels of support (12,66%). The least predominance of F, which it was never showed to respondents as the first choice in the companies' combinations, together with the predominance of A, clearly displayed the framing bias and lead to the application of the multiple ranking choice method.

Table 4: Most preferred environmental objectives

Objective	first company votes	second company votes	total votes	first company consistency	second company consistency	Consistency factors
A	390	0	390	0.846771759		0.846771759
B	241	48	289	0.821347963	0.833999319	0.827673641
C	202	128	330	0.800051709	0.817352947	0.808702328
D	139	191	330	0.762977256	0.809855353	0.786416305
E	60	243	303	0.737810559	0.808751006	0.773280782
F	238	0	238	0.80997911		0.80997911

Source: elaborated by the author.

- A Climate change mitigation.
- B Climate change adaptation.
- C Sustainable use and protection of water and marine resources.
- D Transition to a zero-waste economy.
- E Pollution prevention and control.
- F Protection and restoration of biodiversity and ecosystems

Consistency = media consistency of every A (first) or every second choice (second consistency).

Factors= media first and second choice.

Final consistency= total vote multiplied the consistency factor.

Also, some questions, especially for adaptation, the most complex concept, were reformulated to introduce the salience effect, to highlight most important information, and simplify descriptions. Table 1 shows the order of most preferred environmental objectives, in terms of absolute votes across domains, is A, C and D (equal votes), E, B, F. when we consider consistency-adjusted votes, the order of preference slightly changes in A, C, D, B, E, F but confirms A as the most preferred environmental objective with also the most consistency factor due to the highest investments in the environmental objective.

Table 5 instead shows preferences ranking across companies and domains. A framing effect was also observed in these preferences, having the first four choices represented but domain 1. Consistency of choices have been evaluated by confronting the invested amount in each company with company

selection to integrate sustainability preferences assessment with preferences evaluation. This confirmed F to stay last, but distinguished C from D, with C by clearly reaching a second position with 82.7% over 80.6% of choices of D.

Table 5: Preferences for single action

Preference	Consistency-adjusted votes
A1	92.81338481
C1	84.38392857
E1	75.97277462
D1	70.87357955
D3	67.42857143
A3	64.39298851
B1	63.64548142
A4	63.32251852
C3	62.10416667
A5	58.53913043
B4	57.81481481
E3	54.10560345
A2	50.49411765
F3	48.04285714
F4	47.68278261
B5	45.97826087
C4	45.83215812
B3	45.65
E4	45.07551282
F5	44.47826087
D5	44.34057971
E5	43.2173913
D2	42.34803922
C5	38.43478261
D4	35.70690078
C2	35.61764706
F1	28.69261364
B2	24.70588235
E2	22.16911765
F2	21.93277311

Source: elaborated by the author.

3.4.1.2 Domain prioritisation

The above analysis then led to domain prioritisation, identifying the preferred kind of business, companies choose as sustainable activity, together with their traditional main business being a food manufacturer. The most representative domains included in the final questionnaire are bio-methods, chemical-technological processes, CO₂ emission reduction. This is showed in the following Figure 3, in terms of absolute votes, domain preferences order is 1, 3, 4, 5, 2. This order of preference stays consistent in both cases of absolute votes and consistency-adjusted votes.

Table 6: Order of most preferred environmental domains of action

Domain number	first company votes	second company votes	total votes	Consistency factors	Consistency-adjusted Votes	Domain Description
1	307	184	491	0.854169348	419.3971498	bio method
2	137	108	245	0.812885154	199.1568627	transport
3	208	218	426	0.809709907	344.9364204	chemical
4	201	172	373	0.784292539	292.541117	CO ₂ emission
5	179	166	345	0.8	276	energy

Source: elaborated by the author

3.4.1.3 Loss aversion and risk perception evaluation

Respondents risk perception has been calculated as loss aversion for climate investments using a the convalidated scale of Li et al. ⁴¹⁶ adapted to climate change. The Cronbach alphas (α) calculated with R out of the Likert scale outcomes assessed the reliability of the inquiry and check if identification any of the statements (the items) could be cancelled to improve the final survey. Results, below reported on table 4, showed a low Alpha reliability in total with a 0.5326, which could be increased by eliminating question number 1 to 0.64 and question 6 to 0.59, because they showed a higher $r(\text{item, total})$ values, implying that the item aligns with the overall questions construct. However, due to both the very small sample, and the fact that increase will not made Alpha significant, together with the fact that the scale was already convalidated, it was decided to maintain the original structure of the Li et al. loss aversion scale composed by eight questions.

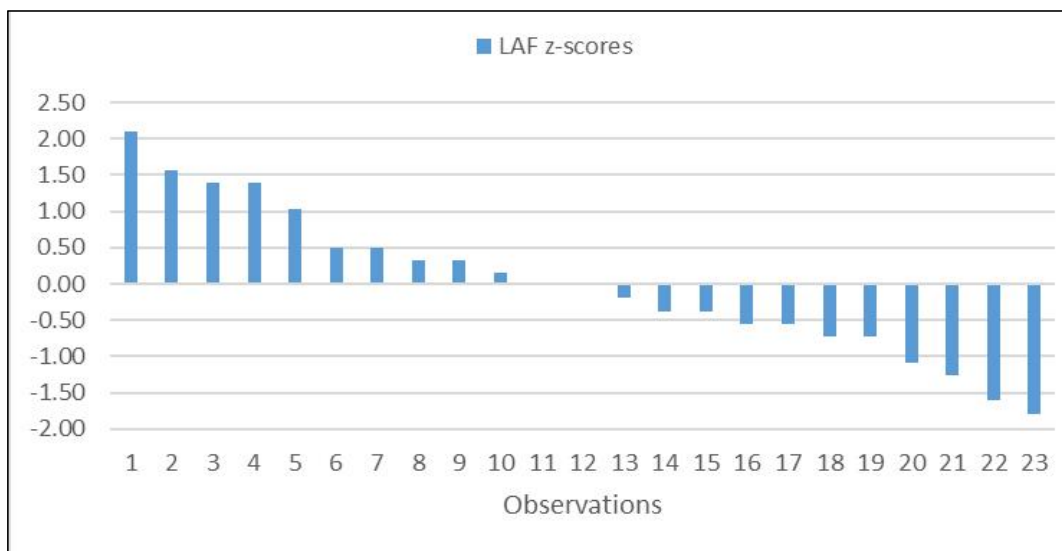
⁴¹⁶ Jin Li, Linlin Chai, Onnolee Nordstrom, Chanchai Tangpong, and Kuo-Ting Hung, 'Development of a Loss Aversion Scale.' (2021) 33(1) Journal of Managerial Issues. 69.

Table 7: Calculated Cronbach alpha

Cronbach alpha is calculated and has a very low Alpha reliability = 0.5326 due to the following data:			
Reliability deleting each item in turn (item, total)	Alpha	Std. Alpha	
A.potential.green.investment.failure.scars.me.more.than.a.potential.success.encourages.me	0.3510	0.3978	0.6454
Avoiding.failed.green.investments.is.less.important.to.me.than.seeking.successful.green.investment.	0.6347	0.6640	-0.1475
Experiencing.a.major.loss.on.a.green.investment.stays.in.my.mind.longer.than.experiencing.a.major.gain.	0.4984	0.5395	0.2539
I.feel.nervous.when.I.have.to.make.a.green.investment.decision.that.may.lead.to.loss.	0.3969	0.4435	0.5128
The.fact.that.my.green.investment.lost.performance.matters.more.than.if.it.earned.the.same.performance.	0.4352	0.4746	0.4534
The.pain.from.losing.on.a.green.investment.matter.much.more.to.me.than.the.pleasure.from.gaining.on.it.	0.3729	0.4157	0.5969
The.suffering.that.comes.with.losses.on.green.investments.can.be.fully.offset.by.the.pleasure.that.comes.from.gains.	0.6644	0.6841	-0.2313
When making a green investment decision I think much more about what might be lost			

Source: elaborate by the author.

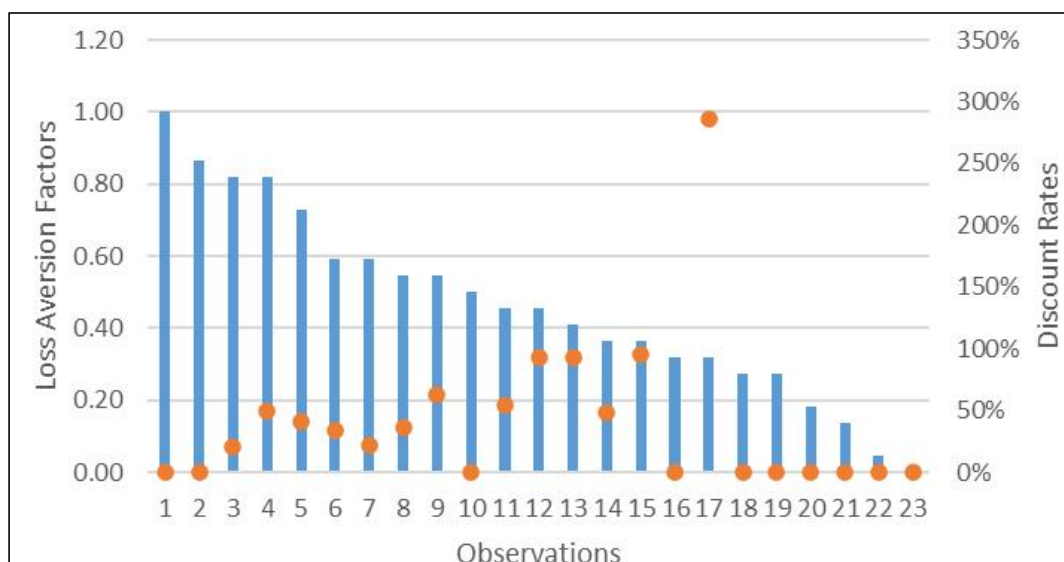
Loss aversion and its z-score are calculated as for paragraph 3.3.2 and illustrated in Figure 03 below, which shows aggregation of data around zero. In fact, the analysis reported a predominant choice on neither agree nor disagree (13 out of 23 respondents) on a transposed Likert scale to -3 strongly disagree to +3 strongly agree.



Source: elaborated by the author.

Figure 2: Loss Aversion Factor (LAF) z-scores

Intertemporal choices have been collected by asking respondents to choose the amount of a forecasted green investment outcome in a determinate date (one year, 2026, 2028, 2030, which is EU fit for 55 deadlines, and 2050 equivalent to EU climate neutrality) and calculated using the methodology described on paragraph 3.2 of this Chapter. A discount rate for each choice has been calculated to be compared with respondents' sustainability preferences to identify the direction and strength of the correlations and plotted in Figure 03 reported below.



Source: elaborated by the author.

Figure 3: Combined loss aversion and discount factors by profile

Profiles 16, 18-23,⁴¹⁷ which show low loss aversion and low discount rate, are considered bold and patient risk takers, motivated to seek gains and delayed rewards. Then the combination of these traits is profiling investors focussing on long term goals, resisting to impulsive decisions, willing to take the risks in pursuit of large potential gains, and possibly skilled at developing and implementing long-term strategies to achieve their goals. These skills and behaviours are considered highly consistent with choices for long term uncertain risk characterized investment for climate change resilience.

On the other extreme, profiles 1-5 have high loss aversion and low and medium discount rate, then are individuals cautiously and patiently chose to take their decisions, because particularly sensitive to negative consequences of their choice but willing to wait for larger and long-term benefits. Then, although open to taking decisions with long-term consequences in mind, they could be reluctant to invest even if the future potential rewards are significant. Having a strategic approach to decision-making, carefully considering the potential consequences, could make then future possible investors for climate change resilient investment when knowledge on risks and benefits can be clearly measured and shown.

⁴¹⁷ Profile 17 is excluded from the analysis as the value of the discount factor seems randomly given.

Profiles 6-15 (excluding n.10) as for the loss aversion factor graph (figure XX) include people with neutral loss aversion and medium high discount rate. In this case are people who make quick decisions without considering potential consequences, such as negative long-term consequences, then they may struggle to resist temptations and impulses that offer immediate rewards the combination of these traits -loss aversion and discount rate- lead to the identification of the suitable profiles for the green nudge⁴¹⁸. Which means to apply the above elements of choice architecture (framing, information lead, simplification etc.) to influences people's behaviour toward green investments in a predictable manner without restricting any available investment option. It is worth mentioning that this category includes the vast majority of respondents. Then the application of a green default will lead to the successful result of most the investors subscribing to a green investment.

3.4.1.4 Pilot test results

This test yielded several insights:

- a. Sustainability domains - including bio methods, chemical solutions, CO2 emissions reduction, energy, and transportation - were prioritized using clustering algorithms like K-means. This led to the selection of the most appropriate company definitions and the rewording of certain questions to avoid framing and information bias.
- b. The construct validity of the questionnaire was assessed in alignment with the research hypotheses to allow the possibility of having a consolidated questionnaire as a result.
- c. The questionnaire was streamlined to 14 core questions using factor-analytic methods, making it compatible with the financial risk profiles of investors. This to avoid complexity bias.
- d. A detailed methodology was established, encompassing: i) the use of descriptive statistics to assess sustainability preferences through respondent
- e. s' selections of companies supporting different hypothetical climate actions, each linked to a taxonomy objective. This allowed for the calculation of choice summation and consistency (Hypothesis 2.a); ii) software analysis (using MS Excel and R) to correlate data with environmental objective prioritization (Hypothesis 2.b) and rank environmental objectives; iii) the simplification of discount factors from 5 to 3 values representing clear political landmarks(one year, 20230 and 2050); iv) the aggregation of individual sustainability preferences to correlate with Hypothesis 3 results concerning loss aversion and discount rates assessment; and v) the calculation of Cronbach's alpha

⁴¹⁸ For green nudge implementation discussion see paragraph 3.5.1 of this chapter III.

(using R) from the Likert scale outcomes to measure the reliability of loss aversion statements.

- f. Loss aversion and discount rate analysis supported the effectiveness of the implementation of a choice architecture structure for green default to validate hypothesis 1⁴¹⁹.

3.4.2 Final questionnaire

3.4.2.1 Sustainability preferences assessment, evaluation

Hypothesis: H2 (a) how often investors decide to invest in a company and (b) how much they are willing to invest, with a certain environmental objective varies depending on the environmental objective?

To test the above hypothesis six alternative of positive environmental actions that companies can adopt/implement to enhance their environmental performance (footprint) to greening their production system on each of the below domains are presented to respondents:

- Application of bio-economy processes and bio-methods.
- Reduction of chemical inputs.
- Reduction of greenhouse gas emissions.

For each of the above domains, survey respondents are asked to:

1. rank among three groups, representing the three above domains of six environmental actions from 1 = most preferred to 6 = least preferred, randomly presented.
2. distribute an investment capital (at risk) of GBP 9000 across the portfolio of the same environmental actions divided in the three domains groups and randomly presented.

Task 1 captured absolute sustainability preferences choices, with no other factor attached (unbiased choice), and task 2 added to the previous the evaluation of sustainability preferences by asking respondents to allocate a portfolio. The combined valuation nuanced results, as respondents can also prefer an environmental objective, but considering the development of a financial instrument in that objective or the performance of the preferred objective not competitive then choose to invest on a different option considered more viable.

⁴¹⁹ See paragraph 1.6.6 of chapter I.

Subsequently, the two rankings (the unbiased choice and the vote-with-capital one) may or may not be consistent. Inconsistency signals that the respondent believes that her absolute preferences are not matched with equally ranked profitability expectations. In the below table 5 shows ranking of sustainability preference assessment (unbiased choice), ranking vote with capital and synchronised rank data, which have been constructed using investment evaluation as a weight.

To determine the sample’s ranking at company-level positive environmental actions (from individual ranks to sample rank) the vote counting methodology of Borda count has been used. In an ordinary Borda system, the voter’s ranking order is assigned with decreasing score values. Since there are six options to be ordered, a voter’s first choice gets a score of 1, second choice gets a score of 2 and following on. Successful option is the one with the smallest total score value. While the option scoring highest is the least preferred. Options in between are placed accordingly to their total score.

Table 8: Sustainability preferences assessment and evaluation

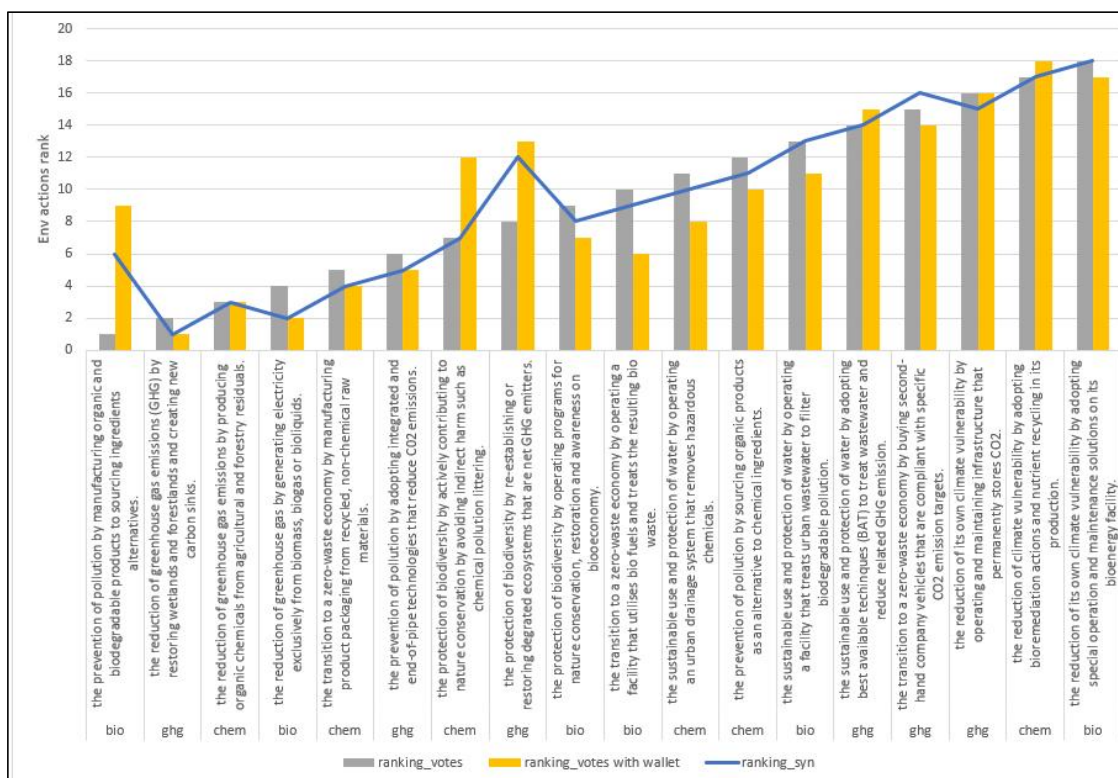
Dominion	Action description	Votes	Investment	Syn vote	Ranking votes	Ranking votes with capital	Ranking synthetic
bio	the prevention of pollution by manufacturing organic and biodegradable products to sourcing ingredients alternatives.	524	268790	553	1	9	6
ghg	the reduction of greenhouse gas emissions (GHG) by restoring wetlands and forestlands and creating new carbon sinks.	534	331314	501	2	1	1
chem	the reduction of greenhouse gas emissions by producing organic chemicals from agricultural and forestry residuals.	543	302957	541	3	3	3
bio	the reduction of greenhouse gas by generating electricity exclusively from biomass, biogas or bioliquids.	553	308664	526	4	2	2
chem	the transition to a zero-waste economy by manufacturing product packaging from recycled, non-chemical raw materials.	572	300919	549	5	4	4
ghg	the prevention of pollution by adopting integrated and end-of-pipe technologies that reduce	573	284459	551	6	5	5

CO2 emissions.							
chem	the protection of biodiversity by actively contributing to nature conservation by avoiding indirect harm such as chemical pollution littering.	574	254786	573	7	12	7
ghg	the protection of biodiversity by re-establishing or restoring degraded ecosystems that are net GHG emitters.	593	247137	620	8	13	12
bio	the protection of biodiversity by operating programs for nature conservation, restoration and awareness on bioeconomy.	597	273807	583	9	7	8
bio	the transition to a zero-waste economy by operating a facility that utilises bio fuels and treats the resulting bio waste.	600	283591	585	10	6	9
chem	the sustainable use and protection of water by operating an urban drainage system that removes hazardous chemicals.	620	269510	607	11	8	10
chem	the prevention of pollution by sourcing organic products as an alternative to chemical ingredients.	639	262886	609	12	10	11
bio	the sustainable use and protection of water by operating a facility that treats urban wastewater to filter biodegradable pollution.	652	257396	629	13	11	13
ghg	the sustainable use and protection of water by adopting best available techniques (BAT) to treat wastewater and reduce related GHG emission.	667	244508	635	14	15	14
ghg	the transition to a zero-waste economy by buying second-hand company vehicles that are compliant with specific CO2 emission targets.	681	245249	674	15	14	16
ghg	the reduction of its own climate vulnerability by operating and maintaining infrastructure that permanently stores CO2.	690	232633	658	16	16	15
chem	the reduction of climate vulnerability by adopting bioremediation actions and nutrient recycling in its	790	203242	758	17	18	17

	production.							
bio	the reduction of its own climate vulnerability by adopting special operation and maintenance solutions on its bioenergy facility.	812	204152	770	18	17	18	

Source: elaborated by the author.

Figuratively data from the above table are represented on figure 4, of which the blue line is the adjusted data of ranked preferences weighted with capital choices as the synthetic ranking (last column of table 8). These data are also used in the following calculations for regression with objectives prioritisation, loss aversion and risk evaluation (discount factor). The graph below clearly shows both elected objectives and discrepancies due to the weighting action.



Source: elaborated by the author

Figure 4: Vote by preference versus vote with capital

H1a and b have been positively validated because the amount and the type of environmental actions in which to invest are dependent on each other. Then both questions that enable the assessment and the evaluation of the preferences on a synthetic data are suggested to evaluate sustainability preferences in a final questionnaire as discussed on paragraph 3.5.2 of this chapter.

3.4.2.2 Sustainability preferences prioritisation.

H2 c the frequency and amount of investments correlates across environmental actions and correlates with the prioritisation of the environmental objectives.

Task 3 modelled the adjusted preferences to also include respondents' choices for a preferred environmental objective which weighted preferences assessment as well together with preferences evaluation through a multiple classification model. Table 9 represents Pearson correlation ρ (rho) values between the same pairs of objectives. All the population correlation coefficients are negative and weak spanning within -0.1111, which represents the correlation of climate adaptation and sustainable use of water, and -0.33612863, as the correlation value of climate change mitigation and protection of biodiversity. This highlights that the probability that a respondent who chose mitigation will not choose adaptation and water with a probability of 21%, pollution with a probability of 24%, circular economy with 28% and biodiversity with 33%. While the correlation of the objectives with the single actions, as showed on tables 10,11 and 12 respectively for the bio-method domain, chemical and CO2 emission reduction, is consistently positive with the objective and the related action with a strength that varies from a 45% of biodiversity for bio-methods (table 10) to the 0.6% of pollution for chemical (table 11). For bio-methods there are also a negative 21% probability of not choosing pollution while choosing biodiversity, and a 24% of not mitigation while choosing water, while for chemical and technological process, correlations show lower values with a 16% negative values between mitigation-water and adaptation-circular economy, and a positive 16% of choosing adaptation-mitigation and adaptation-pollution. In the CO2 dominion (table 12) the negative value of 22% represents the choice between biodiversity-pollution and 17% between mitigation-circular economy.

Table 9: Correlation among objectives

	Climate.change	Climate.ch	Sustainable	Transition	Pollution.p	Protection
Climate.change.mitigation	-	-0.211741	-0.211741	-0.286209	-0.240092	-0.336129
Climate.change.adaptation	-0.211741134	-	-0.111111	-0.150188	-0.125988	-0.176383
Sustainable.use.and.protection.of.water.and	-0.211741134	-0.111111	-	-0.150188	-0.125988	-0.176383
Transition.to.a.zero.waste.economy	-0.286208516	-0.150188	-0.150188	-	-0.170297	-0.238416
Pollution.prevention.and.control	-0.240091879	-0.125988	-0.125988	-0.170297	-	-0.2
Protection.and.restoration.of.biodiversity.an	-0.33612863	-0.176383	-0.176383	-0.238416	-0.2	-

Source: elaborated by the author.

Table 10: Correlation among objectives and sustainability actions bio-methods dominion

	Climate.char	Climate.char	Sustainable	Transition.to	Pollution.pre	Protection.a
the.reduction.of.greenhouse.gas.by.generating.ele	0.2651449	0.0755929	-0.0251976	-0.1173157	-0.0171429	-0.2068571
the.reduction.of.its.own.climate.vulnerability.by.a	0.1002828	0.1564382	-0.0082336	0.0094805	-0.1026962	-0.1437746
the.sustainable.use.and.protection.of.water.by.op	-0.2400919	0	0.3149704	0.0315365	0.0285714	-0.0171429
the.transition.to.a.zero.waste.economy.by.operat	-0.1121532	0.035007	-0.140028	0.3248045	0	-0.0952661
the.prevention.of.pollution.by.manufacturing.orga	-0.1104736	-0.0625	0.0416667	-0.0166875	0.2834734	-0.0755929
the.protection.of.biodiversity.by.operating.progra	0.0673341	-0.1370771	-0.1370771	-0.1730315	-0.2109419	0.4507495

Source: elaborated by the author.

Table 11: Correlation among objectives and sustainability actions chemicals and technology processes dominion

	Climate.char	Climate.char	Sustainable	Transition.to	Pollution.pre	Protection.a
the.reduction.of.greenhouse.gas.emissions.by.prod	0.1862024	0.1621779	-0.1621779	-0.1333844	0.0157622	-0.0956241
the.reduction.of.climate.vulnerability.by.adopting.b	0.1077137	0.019118	-0.0764719	-0.0267987	0	-0.0520266
the.sustainable.use.and.protection.of.water.by.ope	-0.0734797	-0.140028	0.326732	0.0443977	0	-0.0952661
the.transition.to.a.zero.waste.economy.by.manufa	-0.1104736	-0.1666667	0.09375	0.2336255	0.0944911	-0.1133893
the.prevention.of.pollution.by.sourcing.organic.pro	-0.1196798	0.1666667	-0.0416667	0.0166875	0.0629941	-0.0251976
the.protection.of.biodiversity.by.actively.contributi	-0.0020878	-0.0251976	-0.1259882	-0.1173157	-0.1542857	0.3417143

Source: elaborated by the author.

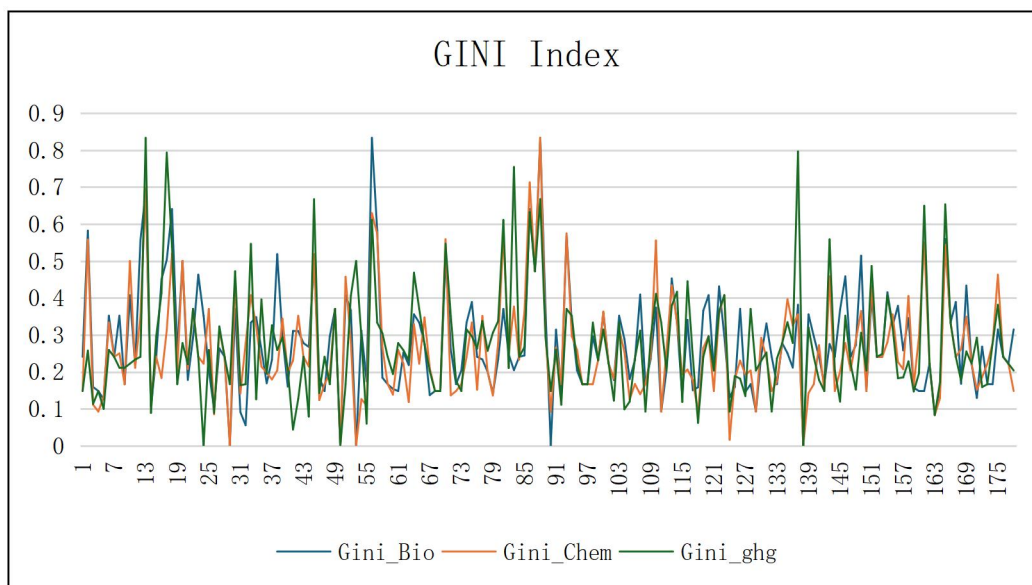
Table 12: Correlation among objectives and sustainability actions CO2 emissions reduction dominion

	Climate.char	Climate.char	Sustainable.i	Transition.to	Pollution.pre	Protection.a
the.reduction.of.greenhouse.gas.emissions..GHG..by.restoring.v	0.136052	-0.077757	-0.0320176	-0.0341185	-0.0777954	0.0238573
the.reduction.of.its.own.climate.vulnerability.by.operating.and.	0.0393616	0.1789203	-0.129563	-0.0762908	0.0209872	-0.0265838
the.sustainable.use.and.protection.of.water.by.adopting.best.a	-0.0531317	-0.0120992	0.3508778	-0.0829835	-0.0411577	-0.0795716
the.transition.to.a.zero.waste.economy.by.buying.second.hand	-0.1734299	-0.0120992	-0.0725954	0.3046768	0.0685962	-0.0795716
the.prevention.of.pollution.by.adopting.integrated.and.end.of.p	0.1198879	0.035007	-0.023338	-0.0023367	0.1058512	-0.2222876
the.protection.of.biodiversity.by.re.establishing.or.restoring.deg	-0.1121532	-0.081683	-0.081683	-0.0958056	-0.0529256	0.3704793

Source: elaborated by the author.

H2 d Investor's differ in how much they prefer investing into one company objective vs. distributing investments equally across objectives.

To test the above hypothesis, a GINI index has been calculated for each dominion to measures the extent to which the distribution of data diverges from a state of perfect equality. Therefore, a higher value indicates a greater distance from perfect equality and reflects more pronounced inequalities. In this very case the GINI index for the overall respondents across dominions showed that data are concentrated (average data for bio is 0.277952, chemical 0.263284 and ghg 0.274208), then the homogeneity of investments amount across dominions.



Source: elaborated by the author.
Figure 5: GINI index per dominion

The same trend is illustrated in figure 05, which visually shows figures for each respondent, having only three peaks overcoming the high value of 80 (n.14 scored 0,83 for ghg, n.57 scored 0.8 for bio and n.89 scored 0.83 for bio and chemicals), while most of the sample is staying below 50 with a diversified portfolio for all objectives across dominions.

H2 c and d cannot be considered validated by the very low data of correlation in the first case that does not suggest a modification on the rank of preferences as presented in table 8 and by the homogeneity of data in the second analysis across dominion and objectives. Then questions on prioritisation will not be added in the final questionnaire to be included in the MiFID II as discussed in paragraph 3.5.2 of this chapter.

3.4.2.3 Loss aversion

Task 4 consisted in calculating respondent loss aversion factor (LAF),⁴²⁰ which resulted distributed around zero because of the strong influence of central responses (scaling as neither agree nor disagree, slightly agree and slightly disagree) which collected replies from a minimum of 84 participants (48%) for

⁴²⁰ As for the methodology described in the general paragraph of statistical analysis of 3.3.2 and for the pilot test implementation in paragraph 3. 4.1.3 (excluding Cronbach alpha calculation) of this chapter III.

the first question, to a maximum of 115 (65%) respondents for the second one, while more than 100 participants gave a central reply to each of the other questions (Table 13 below).

Table 13: Replies to loss aversion questions' answers of 175 respondents

Statement	Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree	Overall
When making a green investment decision, I think much more about what might be lost than what might be gained.	10 5.71%	42 24%	27 15.43%	29 16.57%	28 16%	34 19.43%	5 2.86%	175 n = 175
The fact that my green investment lost performance matters more than if it earned the same performance.	2 1.14%	29 16.57%	28 16%	57 32.57%	30 17.14%	27 15.43%	2 1.14%	175 n = 175
I feel nervous when I have to make a green investment decision that may lead to loss.	5 2.86%	11 6.29%	23 13.14%	17 9.71%	66 37.71%	45 25.71%	8 4.57%	175 n = 175
The pain from losing on a green investment matter much more to me than the pleasure from gaining on it.	8 4.57%	33 18.86%	37 21.14%	26 14.86%	40 22.86%	27 15.43%	4 2.29%	175 n = 175
Avoiding failure of green investments is more important to me than seeking success of green investments.	12 6.86%	36 20.57%	41 23.43%	31 17.71%	28 16%	23 13.14%	4 2.29%	175 n = 175
The experience of a major loss on a green investment stays in my mind longer than a major gain.	8 4.57%	27 15.43%	29 16.57%	34 19.43%	40 22.86%	30 17.14%	7 4%	175 n = 175
A potential green investment failure scares me more than a potential success encourages me.	14 8%	23 13.14%	44 25.14%	36 20.57%	26 14.86%	28 16%	4 2.29%	175 n = 175
The disappointment that comes with losses on green investments can not be offset by the pleasure that comes from gains.	17 9.71%	30 17.14%	41 23.43%	31 17.71%	29 16.57%	24 13.71%	4 2.29%	176 n = 175



Source: QuestionPro elaboration of Investors Green Decision-Making questionnaire (Bath University).

More detailed data analysis is showed in Figure 6 below where absolute values of LAF are mapped in decreasing order together with the Lorenz line of LAF to evaluate the progressive effect of occurrences⁴²¹. The respondent category of respondents with absolute LAF -1 to +1 is the largest including 17% of the total sample. Since zero loss aversion is also the point where people will move from perceiving gains to losses of green investments, the zero point can also be identified in analogy with the prospect theory⁴²² as a

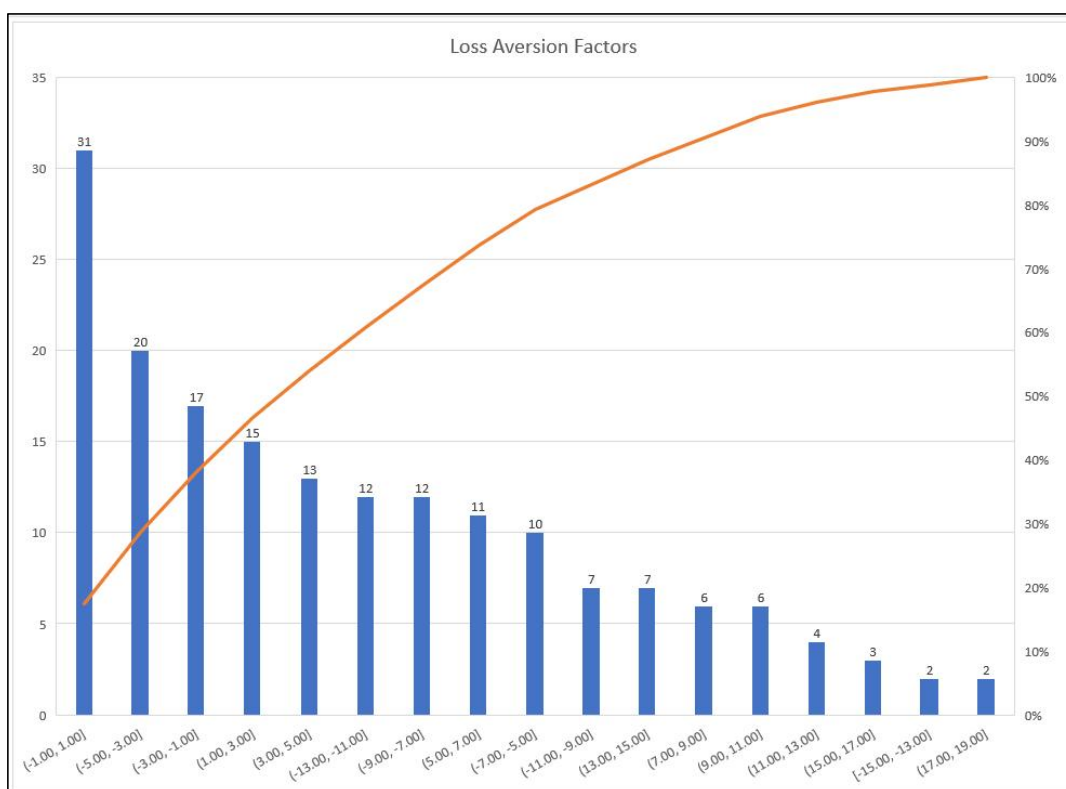
⁴²¹ See paragraph 3.2.2 of this chapter for LAF calculation.

⁴²² See paragraphs 2.3.3 and 2.4.3 of chapter II, on loss aversion and status quo.

reference point or the status quo.

Source: elaborated by the author.

Figure 6: Loss aversion factors compared to loss aversion cumulative respondents' data.

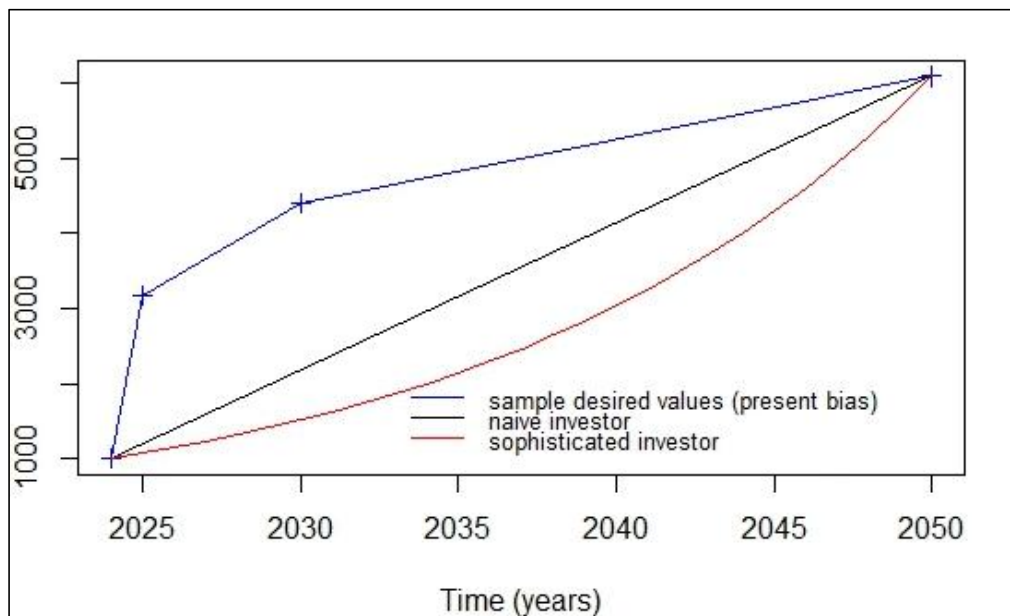


3.4.2.4 Intertemporal choices

Task 5 elaborated the analysis of the discount rate (dr), which has been chosen as a proxy of a person's inner time preference (or value of time) because is a forecasted rate used to discount future cash flows to determine the present value of an investment. Also, the Internal Rate of Return (IRR) metric has been calculated to estimate the profitability of potential investments. IRR is the discount rate that makes the Net Present Value (NPV) of future cash flows equal to zero, then, is the investment annual return and not the actual dollar value of the investment. Consequentially, the IRR must be greater than the discount rate otherwise the NPV will be negative, meaning that the

expected return of the investment will not be realised. Then the lottery questions of the questionnaire to produce the dr have been structured to produce only positive amounts.

Discount rates are calculated using the MS Excel built-in Goal Seek function (objective function method) that adopts an iterative process to seek the rate that null the net present value of a future cash flow form an initial capital investment. The iterative process starts with the determination of a tentative discount rate (between 0 and 1), and then calculates the three discount factors - one per period, to further calculates three discounted cash flows by multiplying the respondent's expected values plus interests' times the obtained discount factors – per each period. The three discounted cash flows are summed up, and then initial invested capital (C0) subtracted the to the sum of the discounted cash flows. The Net Present Value (NPV) is calculated to finally run the Goal Seek function by setting the NPV to be equal to zero then changing the tentative discount rate.



Source: elaborated by the author.

Figure 7: Mean expected value of investments

The value of pure time preferences, which indicates the revealed preference of one individual in allocating their money either in present or future periods, shows the individual's willingness to wait for future rewards waiving some value in the present and varies from high for individuals who focus more on

present, and low value for those who are future oriented.⁴²³ Figure 7 above represents the plots of a quasi-logarithmic curve, a linear curve, and an exponential curve (based on sample data), representing the present-biased, naive, and sophisticated investor profiles, respectively. Calculated by substituting values of x (investment period) into the resulting equations, y (investment value) is estimated for the naive and sophisticated investor profiles for the years 2025 and 2030. These theoretical investment values are then input into the IRR computation to estimate the corresponding theoretical discount rates. Finally, the discount rates are divided by 25 to obtain an annual discount rate.

The quasi-logarithmic function shows an average respondents' fast-growing expected value of the investment in the first year (with slope $m^{424}=2,182$) which slows down on the medium-term period ($m= 0.246$) of 2025-2030, to reduce even further ($m=0.084$) in the long term from 2030-2050.

The evident present bias behaviour is jeopardising the possibility of reaching climate neutrality by the forecasted date because influencing the shape of the pseudo logarithmic curve leveraging the discount rate per year at the value of 0.0888⁴²⁵. Climate neutrality, instead, can be reached by a naïve investor pacing on a linear development to reach the average future value of the investment in 2050 of 6092 considering the present value at year 2024 equal to 1000, with an average constant rate per year of 0.0224⁴²⁶. While a pro-climate sophisticated investors will be instead reaching climate neutrality by climbing an investment curve that is exponential showing high value for the future with lower discount factors per year in the present of 0.0172 because expecting higher profits in the future⁴²⁷.

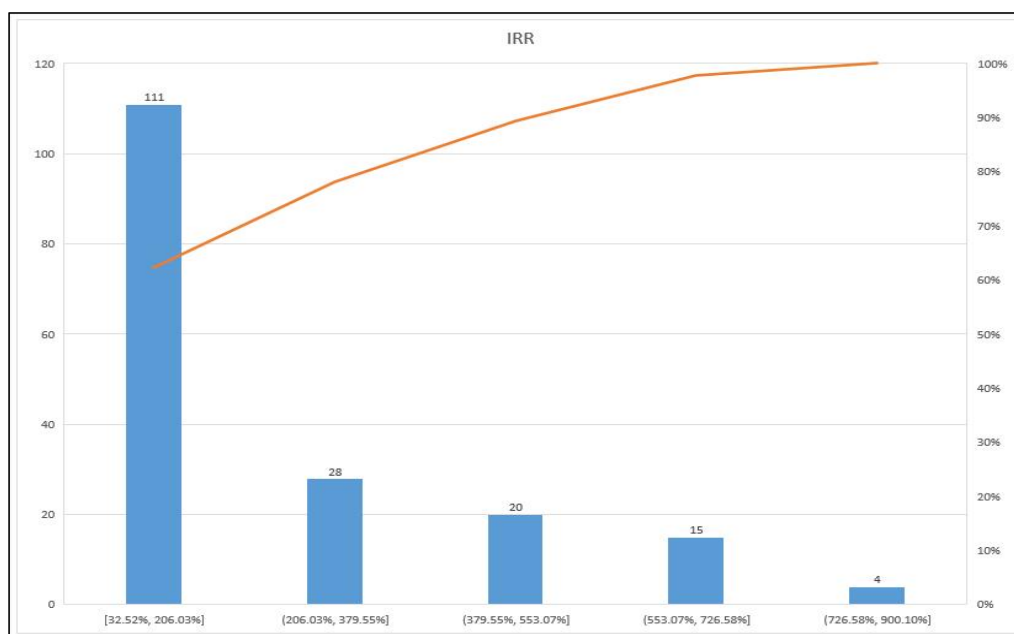
⁴²³ Richard H. Thaler, 'Some empirical evidence on dynamic inconsistency' (1981) 8 Economic Letters 201; Eyal Lahav, Mosi Rosenboim and Tal Shavit, 'Financial literacy's effect on elicited subjective discount rate' (2015) 35(2) Economics Bulletin 1360.

⁴²⁴ $m=(y1-y2)/(x1-x2)$. Data are the expected average investment values of the sample equal to $y1=3182$ (in $x1= 2025$), $y2=4412$ (in $x2=2030$) and $y3=6092$ (in $x3=2050$).

⁴²⁵ on a pseudo-logarithmic curve, the discount rate per year is the expected average investment values of the sample equal to 3182 (in 2025), 4412 (in 2030) and 6092 (in 2050).

⁴²⁶ straight line passing through the coordinate points a(2024,1000) and b(2050,6092), of which the value of x has been replaced by 2025 and 2030 in the equation to calculate y values respectively for those years. Since, y is the expected value of the initial investment s in these years, IRR has been calculated $[(NPV-Initial\ capital) / (Initial\ capital * 25)] * 100$.

⁴²⁷ Consistently with profiles 18-23 and 16 as explained in paragraph 3.4.1.3 exponential curve passing through the coordinate points a(2024,1000) and b(2050,6092), of which the value of x has been replaced by 2025 and 2030 in the equation to calculate y values respectively for those years. Since, y is the expected value of the initial investments in these years, IRR has been calculated $[(NPV-Initial\ capital) / (Initial\ capital * 25)] * 100$.



Source: elaborated by the author.
Figure 8: IRR-dr data

However, the average Internal Rate of Return per annum calculated for respondent who clustered in the below category of IRR, which significantly covers 62% of the total sample, (Figure 08) lowered to 0.04264, which is closer to zero than the rata above calculated of 0.0888 but still ranking at high level.

In fact, significant debate come into life around the amount of a discount rate for Climate Change following the Stern Report on 2006.⁴²⁸ Stern data for discount rate are based on the assumption of a yearly long-run growth of 1.3% output a discount rate of 0.001⁴²⁹ per year with an equilibrium real interest rate of 0.014 per annum. Nordhaus⁴³⁰ considered Stern discount rate too low and

⁴²⁸ Lawrence H. Goulder and Robertson C. Williams III, 'The Choice of Discount Rate for Climate Change Policy Evaluation' (2012) NBER Working Paper Series 18301 <https://www.nber.org/system/files/working_papers/w18301/w18301.pdf> accessed 23 October 2024; Robert O. Mendelsohn, 'A Critique of the Stern Report' (2006) 29(4) Regulation 42<<https://ssrn.com/abstract=956699>> accessed 23 October 2024.

⁴²⁹ In the Stern Review the appropriate pure time discount rate 0.1 per cent because it considers an almost 10% chance of human race extinction by the end of a century. Nicholas Stern, 'Stern Review: The Economics of Climate Change' (2006) UK Her Majesty's Treasury 47.

⁴³⁰ William D. Nordhaus, 'A Review of the Stern Review on the Economics of Climate Change.' (2007) XLV Journal of Economic Literature 686.

adopted a discount rate of 0.015 in the empirical model DICE⁴³¹ with consumption elasticity⁴³² of 2 per annum assuming that climatic investments have same risk properties of other capital investments, then its results include both the combination of discount rate and consumption elasticity in the rate of return on capital,⁴³³ while Acemolgu et al. analysis found that the difference between the two discount rates will be irrelevant, with a high elasticity of substitution between clean and dirty inputs, as these scarcely influence the nature of the optimal environmental policy.⁴³⁴

Furthermore, the application of a nearly zero-time discount rate application promotes ethical concerns of intergenerational neutrality, because future generations are treated into the indefinite future symmetrically with present generations⁴³⁵, while the case of negative time discount rate means that the welfare of future generations increases, compared to nearer generations, because weighted more than current ones. Then, low discount rates represent the prominence of ethical concerns, over future-oriented loss-based concerns as potential future negative consequences of naturally caused disaster risks. Subsequently, this implies that temporal discounting values of environmental risks are less pronounced⁴³⁶, because if investments would have been perceived as unsafe from climate in the future, then considered riskier, a higher discount rate will be applied to represent the greater perceived risk⁴³⁷.

Then the closer to zero-time discount rate of 0.04264 reflects more ethical concerns than environmental concerns, which are instead taken into account by a sophisticated investor who does not show a present bias but clearly invest in the future with a discount rate, which is more aligned to literature, of 0.0172. Compared to sophisticated investors, neutral averse investors (17% of the sample) has an average IRR of 0,011 which suggests that for neutral averse respondents it will be possible to move to a more profitable investment in the future which is very close to their status quo from which moving can be seen as a loss as the higher discount rate shows higher risk perception,

⁴³¹ Dynamic Integrated model of Climate and the Economy (DICE).

⁴³² Which is equal to 1 in Stern review.

⁴³³ William D. Nordhaus, 'A Review of the Stern Review on the Economics of Climate Change.' (2007) XLV Journal of Economic Literature 686,700.

⁴³⁴ Daron Acemoglu, Philippe Aghion, Leonardo Bursztyn and David Hemous, 'The Environment and Directed Technical Change' (2009) 102(1) American Economic Review 131.

⁴³⁵ William D. Nordhaus, 'A Review of the Stern Review on the Economics of Climate Change.' (2007) XLV Journal of Economic Literature 686,700.

⁴³⁶ Nicholas Stern, 'Stern Review: The Economics of Climate Change' (2006) UK Her Majesty's Treasury; Laurie Hendrickx and Sietske Nicolaij, 'Temporal discounting and environmental risks: The role of ethical and loss-related concerns' (2004) 24(4) Journal of Environmental Psychology 409.

⁴³⁷ Nicholas Stern, 'Stern Review: The Economics of Climate Change' (2006) UK Her Majesty's Treasury 45.

making this part of the sample suitable to be nudged towards a green default⁴³⁸.

3.4.2.5 Risk Perception evaluation

H3a – how often and how much investors are willing to invest into one of the six environmental objectives correlates a) with loss aversion and b) with discount rate.

Table 14: Environmental objectives correlation with LAF and dr

	Climate.ch	Climate.ch	Sustainabl	Transition	Pollution.p	Protection	LAF.z.scor	IRR.dr.z.sc
Climate.change.mitigation	-	-0.21174	-0.21174	-0.28621	-0.24009	-0.33613	-0.05919	0.073965
Climate.change.adaptation	-0.21174	-	-0.11111	-0.15019	-0.12599	-0.17638	0.026983	0.016628
Sustainable.use.and.protection.of.water	-0.21174	-0.11111	-	-0.15019	-0.12599	-0.17638	-0.00426	-0.05668
Transition.to.a.zero.waste.economy	-0.28621	-0.15019	-0.15019	-	-0.1703	-0.23842	0.051546	-0.08366
Pollution.prevention.and.control	-0.24009	-0.12599	-0.12599	-0.1703	-	-0.2	-0.04283	0.040427
Protection.and.restoration.of.biodiversit	-0.33613	-0.17638	-0.17638	-0.23842	-0.2	-	0.035878	-0.00846
LAF.z.scores	-0.05919	0.026983	-0.00426	0.051546	-0.04283	0.035878	-	0.140418
IRR.dr.z.scores.	0.073965	0.016628	-0.05668	-0.08366	0.040427	-0.00846	0.140418	-

Source: elaborated by the author.

The correlation exercise has also been done by calculating the Pearson's ρ for the environmental objectives, LAF and dr. Pearson coefficients are used as a probability proxy data of investor likelihood to show which option will be chosen instead of the favourite one. As for table 14 correlation appear positive and non-significant, while the single LAF data related to the objectives are close to zero with values alternatively negative or positive respecting the order from one to six as for the taxonomy. dr data are also close to zero but with three objective showing positive data and other three negative data with no special order. Since the amount of data is small the correlation, positive or negative, is considered insignificant.

Pearson's ρ for the environmental actions divided by domain represented in the following tables 15, 16 and 17 to show if there is alignment within environmental actions and risk perception (LAF) and discount calculation (dr). Data are very much aligned in the three domains with a maximum positive but weak correlation of LAF and dr of 0,14 which on first domain

⁴³⁸ For more information on default characteristics and application see paragraphs 2.3.5 and 2.4.5 of chapter II.

(bio method table 15) is overcome by the relationship of LAF with the protection of biodiversity, an action that during election of preferences ranks 9 in the absolute vote, 7 in the vote with capital and the 8 as weighted action. All other ρ values for LAF and dr rank below 0.098438, which represents the correlation of LAF with the transition to a circular economy, while correlation data within environmental objectives score negatively and below -0,2953187 (protection of biodiversity and reduction of ghg).

Table 15: Environmental objectives, LAF and dr correlation bio-methods domain

	the.reductio	the.reductio	the.sustaina	the.transitio	the.preventi	the.protectio	LAF.z.scor	IRR.dr.z.sc
the.reduction.of.greenhouse.gas.by.generating.ele-	-	-0.1437746	-0.2	-0.2222876	-0.2645751	-0.2953187	-0.1249	-0.03945
the.reduction.of.its.own.climate.vulnerability.by.ac	-0.1437746	-	-0.1026962	-0.1141404	-0.1358542	-0.1516405	-0.00958	0.06067
the.sustainable.use.and.protection.of.water.by.op	-0.2	-0.1026962	-	-0.1587768	-0.1889822	-0.2109419	-0.02222	-0.14531
the.transition.to.a.zero.waste.economy.by.operati	-0.2222876	-0.1141404	-0.1587768	-	-0.210042	-0.2344488	0.098438	-0.01468
the.prevention.of.pollution.by.manufacturing.orga	-0.2645751	-0.1358542	-0.1889822	-0.210042	-	-0.2790499	-0.00852	-0.04488
the.protection.of.biodiversity.by.operating.progra	-0.2953187	-0.1516405	-0.2109419	-0.2344488	-0.2790499	-	0.069707	0.169686
LAF.z.scores	-0.1249	-0.00958	-0.02222	0.098438	-0.00852	0.069707	-	0.140418
IRR.dr.z.scores.	-0.03945	0.06067	-0.14531	-0.01468	-0.04488	0.169686	0.140418	-

Source: elaborated by the author.

In the chemical domain (table 16) the maximum positive value, although very low in absolute terms (+0.0695885), is represented by the correlation of LAF and the prevention of pollution objective. The maximum correlation within environmental preferences is related to the reduction of climate vulnerability with the prevention of pollution with a negative value close to zero (-0.0764719).

Table 16: Environmental objectives, LAF and dr correlation chemical and technologies domain

	the.reductio	the.reductio	the.sustaina	the.transitio	the.preventi	the.protectio	LAF.z.scores	IRR.dr.z.sc
the.reduction.of.greenhouse.gas.emissions.by.producing.c	-	-0.1435095	-0.2627807	-0.3127716	-0.2085144	-0.3310064	-0.0282505	0.050833
the.reduction.of.climate.vulnerability.by.adopting.bioreme	-0.1435095	-	-0.0963739	-0.1147079	-0.0764719	-0.1213954	-0.0557136	0.0453659
the.sustainable.use.and.protection.of.water.by.operating	-0.2627807	-0.0963739	-	-0.210042	-0.140028	-0.2222876	0.0005966	-0.0423334
the.transition.to.a.zero.waste.economy.by.manufacturing	-0.3127716	-0.1147079	-0.210042	-	-0.1666667	-0.2645751	0.0149118	0.0178585
the.prevention.of.pollution.by.sourcing.organic.products.e	-0.2085144	-0.0764719	-0.140028	-0.1666667	-	-0.1763834	0.0695885	-0.1078868
the.protection.of.biodiversity.by.actively.contributing.to.n	-0.3310064	-0.1213954	-0.2222876	-0.2645751	-0.1763834	-	-0.0053463	0.0183756
LAF.z.scores	-0.0282505	-0.0557136	0.0005966	0.0149118	0.0695885	-0.0053463	-	0.1404179
IRR.dr.z.scores.	0.050833	0.0453659	-0.0423334	0.0178585	-0.1078868	0.0183756	0.1404179	-

Source: elaborated by the author

In the case of the CO2 abatement domain (table 17) is the correlation of the reduction of climate vulnerability objective, which reaches the maximum positive but weak correlation with dr (+0.1604705) followed in a third place, after LAF-dr correlation, by the same objective correlation with LAF (+0.1257785). An objective that scored third-last in the preferences assessment and evaluation (table 8). This very same objective show also the stronger correlation within environmental objectives with both the sustainable use of water and the circular economy with a negative low vale of -0.1551937.

Table 17: Environmental objectives, LAF and dr correlation CO2 abatement domain

	the.reductio	the.reductio	the.sustainal	the.transitio	the.preventi	the.protectio	LAF.z.scores	IRR.dr.z.scor
the.reduction.of.greenhouse.gas.emis	-	-0.2506755	-0.2575025	-0.2575025	-0.270923	-0.270923	-0.1178012	0.1078515
the.reduction.of.its.own.climate.vulne	-0.2506755	-	-0.1551937	-0.1551937	-0.163282	-0.163282	0.1257785	0.1604705
the.sustainable.use.and.protection.of	-0.2575025	-0.1551937	-	-0.1594203	-0.1677289	-0.1677289	0.0279911	-0.1598777
the.transition.to.a.zero.waste.econor	-0.2575025	-0.1551937	-0.1594203	-	-0.1677289	-0.1677289	-0.0115985	-0.1601839
the.prevention.of.pollution.by.adoptin	-0.270923	-0.163282	-0.1677289	-0.1677289	-	-0.1764706	-0.0948582	-0.0236435
the.protection.of.biodiversity.by.re.es	-0.270923	-0.163282	-0.1677289	-0.1677289	-0.1764706	-	0.1103696	0.0429962
LAF.z.scores	-0.1178012	0.1257785	0.0279911	-0.0115985	-0.0948582	0.1103696	-	0.1404179
IRR.dr.z.scores.	0.1078515	0.1604705	-0.1598777	-0.1601839	-0.0236435	0.0429962	0.1404179	-

Source: elaborated by the author

The fact that the climate adaptation objectives highlighted the stronger correlation, although very weak, with the other objectives, while scoring as third-last, second-last and very last on the classification of preferences assessment and evaluation, is confirmed by the nature of the technical actions of adaptation, which are more interrelated with all the other objectives than any other objective does.

H3a and b are not validated because existing correlations show extremely low data. The calculation of these correlations then will not add significance to the evaluation of preferences assessment and evaluation as for the first two tasks of the questionnaire.

H3c – How investors distribute their investments across objectives (H2d) is correlated with loss aversion. Specifically, investors who distribute investments equally (compared to having strong preferences for one objective) may show stronger loss aversion.

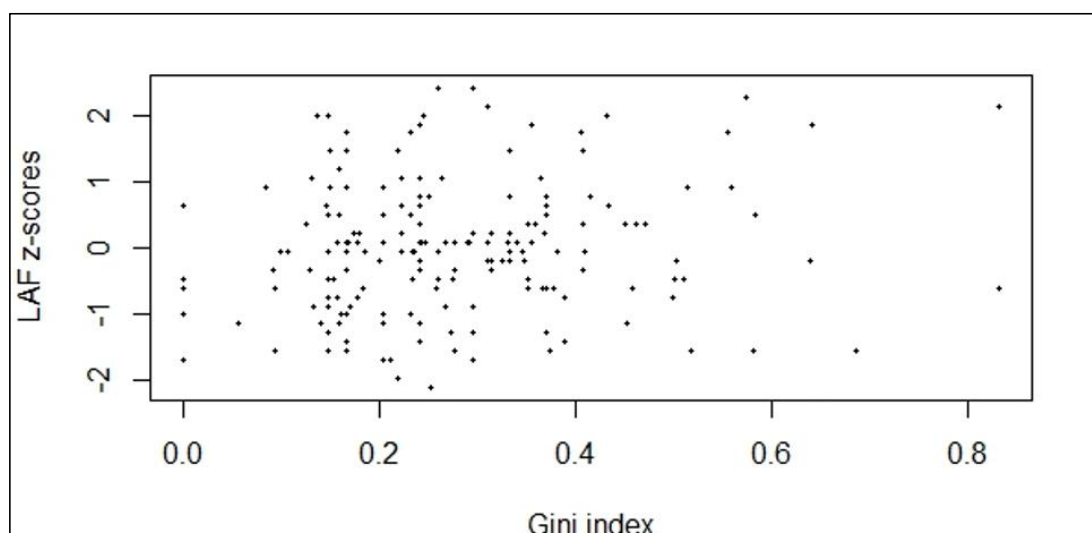
Spearman correlation coefficients have been calculated and GINI index graphed to address the hypothesis that LAF can be a valid predictor of

investment diversification. However, *H3c* is null because of the very low Spearman data (showed on table 18 below) and very weak, practically absent, correlation of LAF and GINI index in every domain as for the figures 8, 9 and 10.

Table 18: Spearman coefficients LAF and dominions

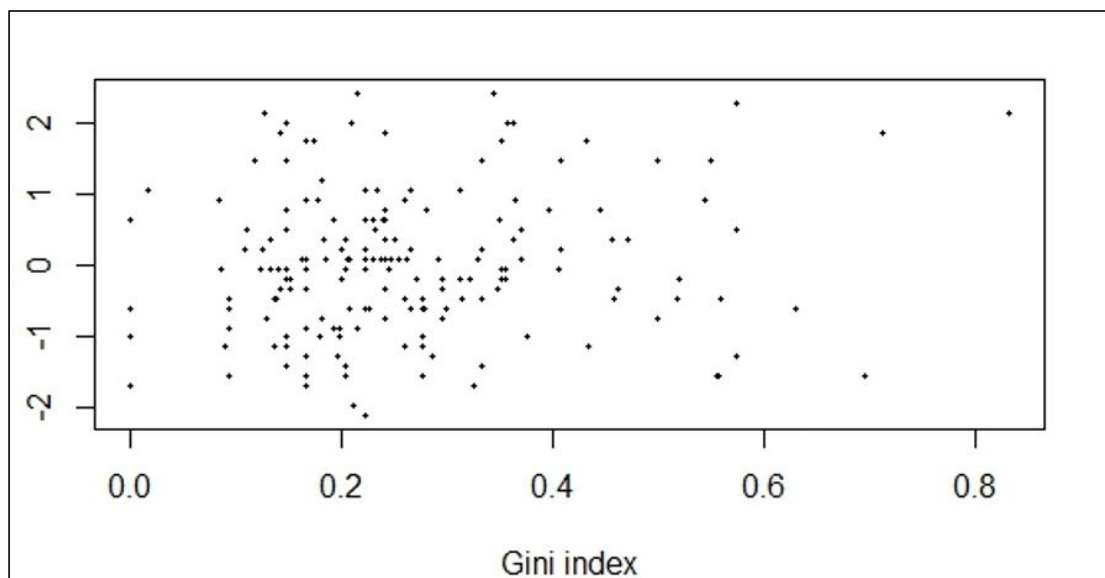
	LAF z-scores
Gini_bio	0.12643592
Gini_chem	0.10759851
Gini_ghg	0.07579197

Source: elaborated by the author



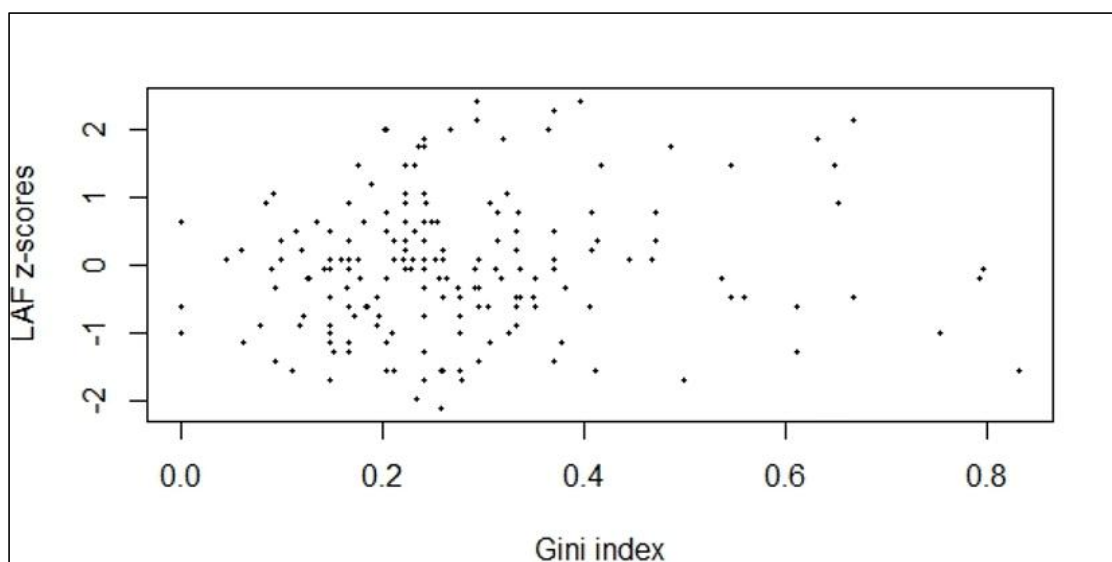
Source: elaborated by the author

Figure 9: LAF z-scores and GINI Index bio-methods dominion.



Source: elaborated by the author

Figure 10: LAF z-scores and GINI Index chemical dominion

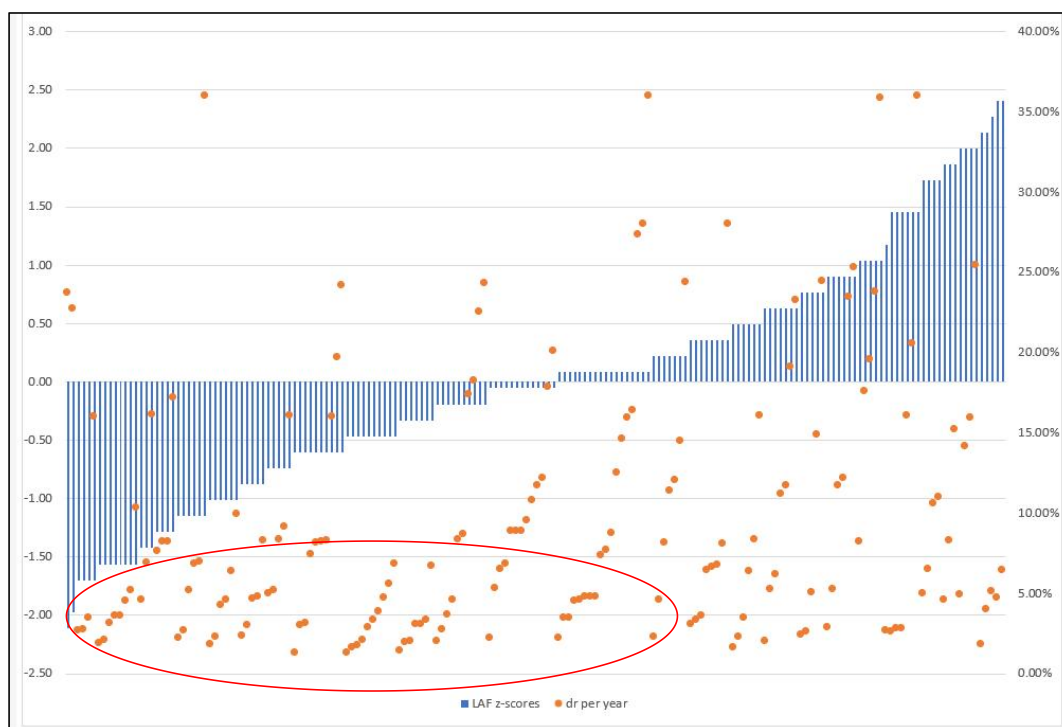


Source: elaborated by the author

Figure 11: LAF z-scores and GINI Index ghg dominion

H3d – Loss aversion for green investments and discount factor should correlate. Such as a high loss aversion will lead to making more conservative and prudential investment choices which normally correspond to a high discount rate then investments with short term benefits.

The multiple classification model calculations, as showed on table 14, there is a non-significant positive correlation of loss aversion (LAF) and discount rate (dr). However, while mapping data as for figure 12 clustering of discount rate can be noted around LAF data (z score) between zero and -2 which with a threshold of 0.06, the average discount rate can be calculated as 0.0295, which is aligned with the naïve investors (figure 5) result of 0.026, supporting the fact that moving toward a green investment create a better off situation for people being neutral averse or having low aversion. Although in the category falls also the people who already invest in green investments as for footnote 285.



Source: elaborated by the author

Figure 12: Loss Aversion Factors (LAF)-discount rate (dr) correlations

H3d analysis does not show a direct correlation of loss discount and LAF data, but a cluster of data of dr can be visually identified for loss averse respondents. dr data are not as low as the calculated discount rate for sophisticated investors (on average equal to 0.017) already investing in green investments, but close to a naïve investor (on average 0.026). Then this hypothesis is accepted because supporting respondents' identification for a green default application to nudge their choice toward a green investment projected to the future with a low discount rate and low loss aversion.

3.5 CHAPTER CONCLUSIONS

Research findings indicate a potential inconsistency between investors' stated preferences during the assessment and their actual choices during the evaluation. Specifically, while respondents initially favour investments based on pure environmental principles (assessment), they do not

necessarily select them as the most financially viable options for their portfolios (evaluation). To address this gap, this research applies an adjusted methodology that ranks preferences and weights them against capital allocation choices. This approach ensures a more synchronized and accurate representation of individual sustainability preferences in investment reporting⁴³⁹. Considering also that financial institutions' legal compliance requirements to preferences evaluation- in terms of which percentage should be invested in a particular environmentally sustainable activity- offer a clear calculation method for determining the sustainable portion of packaged investment funds⁴⁴⁰, but it does not specify how to calculate the minimum percentage of sustainable activities within a private portfolio. Additionally, the preferences for prioritisation of the six environmental objectives of the taxonomy are measured through a task of the questionnaire to be confronted with the assessment of individual preferences. The analysis of reliability and coherence of respondents' answers to the different dimensions of sustainability shows no correlation.

Preference assessment data has also been correlated with loss aversion for green investments and the discount factor applied to future green investment performance. This analysis aims to better understand investor behaviour toward green investments. The goal is to ensure a fair and accurate evaluation of investors' true sustainability preferences, rather than manipulating their choices to steer investments toward pre-existing green options that may be too risky or unsuitable for their individual profiles⁴⁴¹.

Questionnaire answers convalidated the conceptual framework created for the development of bias mitigation actions relevant to financial institutions to supporting investors' best choice of sustainable financial instrument. These research findings also give a better knowledge to policy makers on

⁴³⁹ For questionnaire results analysis for sustainability preferences assessment, evaluation, prioritisation and loss aversion and risk perception see paragraph 3.4.2 of following chapter III. For related policy discussion and recommendation see paragraph 3.5 of the same chapter.

⁴⁴⁰ Matteo Gargantini, 'The New Role of Sustainability Preferences in the Regulation of Investment Services' in Eugenia Macchiavello and Michele Siri (eds) *Sustainable Finance and Financial Education: A snapshot* (eBook, Giappichelli, 2024).

⁴⁴¹ This to abide to recital 8 Commission Delegated Regulation (EU) 1253/2021: 'It is necessary to clarify that financial instruments that are not eligible for individual sustainability preferences can still be recommended by investment firms, but not as meeting individual sustainability preferences. In order to allow for further recommendations to clients or potential clients, where financial instruments do not meet a client's sustainability preferences, the client should have the possibility to adapt information on his or her sustainability preferences. In order to prevent mis-selling and greenwashing, investment firms should keep records of the client's decision along with the client's explanation supporting the adaptation.'

how to address investors to offer the best suitable policy environment to foster green investment choices.

However, as for the limitation of the study paragraph⁴⁴² future research needs to disseminate the questionnaire to a larger sample, through a platform which could include attention checks to increase the overall engagement of respondents to the survey.

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⁴⁴² See paragraph 2.6.3

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CHAPTER 4



Policy and regulation implications discussion.

4 POLICY AND REGULATION IMPLICATIONS DISCUSSION

This research wants to provide understanding on investors preferences and perception of climate risk to help policy-makers in designing and implementing effective and more acceptable climate policies and regulations. In fact, climate neutrality achievement surely depends on the engagement of all actors involved from public to private finance, from corporate to retail. Private investors have already assumed an important role in climate finance by legally being entitled of choosing the adequate financial instrument to their sustainability preferences⁴⁴³. Preferences that through the centrality of decarbonisation created by the green deal, become the leading factor of individuals' support to the low carbon transition in the long term, switching individual conscious action towards the public interest of decarbonisation which may "inhibit individual utility-maximizing behaviour"⁴⁴⁴ for private goals⁴⁴⁵. Then is by climate neutrality commitment promotion that individual behaviour patterns may be aligned not with personal utilitarian preferences but with the relevant public good⁴⁴⁶ of decarbonisation.

Since normally pro-environmental behaviour does not naturally lead to green investments⁴⁴⁷, through sustainability preferences revelation for the political objective of decarbonisation, individuals do not only maximise their own utility, but also incorporate green judgments⁴⁴⁸, to which investors' behaviour can be consistently nudged by the application of an adequate

⁴⁴³ See paragraph 1.6 of chapter I Sustainability preferences and its legal framework for more information of the legal implementation instrument of the suitability assessment.

⁴⁴⁴ James M. Buchanan, 'Individual Choice in Voting and the Market' (1954) 62(4) *Journal of Political Economy* 334; James M. Buchanan, 'Simple Majority Voting, Game Theory, and Resource Use' (1961) 27 (3) *The Canadian Journal of Economics and Political Science / Revue canadienne d'Economie et de Science politique* 340.

⁴⁴⁵ Albert O. Hirschman, *Felicità privata e felicità pubblica* (3rd edition, trad. di Joseph Sassoon, Il Mulino, Bologna 2013) 171.

⁴⁴⁶ Amartya K. Sen, 'Rational Fools: A Critique of the Behavioural Foundations of Economic Theory' (1977) 6(4) *Philosophy & Public Affairs* (1977) 317.

⁴⁴⁷ Anders Anderson and David T. Robinson, 'Financial Literacy in the Age of Green Investment' (2021) 19(6) *Swedish House of Finance Research* 1 <<https://ssrn.com/abstract=3353534>> accessed 27 October 2024.

⁴⁴⁸ Julian Richard Massenberg, *Social values and sustainability: a retrospective view on the contribution of economics*. (Springer Japan KK, part of Springer Nature 2019).

choice architecture for green investment⁴⁴⁹. The study of the effectiveness of a choice architecture for financial services decarbonisation -to construct a correct and ethical use of choice architecture techniques to enhance individuals' green decision-making- is central to this research⁴⁵⁰. This to select most relevant techniques influencing choices for green investing and apply these critically to the extent that decisions can be affected with a positive outcome. Insights into investors' choices and behaviours towards green investments have been evaluated using survey data collected from a representative sample of UK young adult investors.

The outcome of the first two tasks of the questionnaire, which assessed and evaluated sustainability preferences, through the calculation of absolute preferences and the synthetic value of preferences weighted by capital choices adjusted data, is a ranking of absolute and synthetic values. Findings were that the synthetic ranking may change the sustainability preferences absolute vote because people can choose to invest more (or all) capital in one action which does not correspond to the assessed preference because considered more financially viable. From table 8 the best ranked six environmentally sustainable actions one for each six-taxonomy objective - regardless to which dominion the description belonged to - have been extracted to describe the actions of first two final questionnaire questions⁴⁵¹. The third task of the evaluation of the prioritisation of climate and environmental taxonomy objectives resulted not significant, instead. The correlation analysis by showing very low relationship data among objectives do not suggest a modification on preferences ranking (table 8) to be also weighted by prioritisation. Additionally, this finding is also supported by GINI index calculated across dominions for investments distribution among objectives and sustainability actions for the overall respondents, which showed homogeneity of data then not a strong link within objectives and actions (a part of the connected one e.g. the prevention of pollution by manufacturing organic and biodegradable products to sourcing ingredients alternatives with the pollution objective) is existent. Then questions on prioritisation is suggested not to be added in the final questionnaire as discussed in paragraph 4.3 of this chapter.

⁴⁴⁹ 'to properly engage with the criticism based on the claim of nudging as the manipulation of choice, it is necessary to examine the scientific foundations of the nudge approach to see if this criticism actually sticks to it on its own premises.' Pelle Guldborg Hansen and Andreas Maaløe Jespersen, 'Nudge and the Manipulation of Choice A Framework for the Responsible Use of the Nudge Approach to Behaviour Change in Public Policy' (2013) 4(1) *European Journal of Risk Regulation* 3,9.

⁴⁵⁰ for details on behavioural insights for financial services see paragraph 2.3 of chapter II and 243 for the behaviour conceptual framework lay out.

⁴⁵¹ See the following paragraph 3.5.2 on questionnaire adaptation for MiFID II suitability assessment use.

Regarding climate risk perception analysis, findings indicate that respondents show a strong present bias, which steers up the discount factor at the high level of 0.089, jeopardising the possibility of reaching climate neutrality by considering future investments riskier because of climate impact. However, further analysis of the sample identified that a 62% of respondents have the low dr of 0.4264 (Figure 6), which can be confronted with loss aversion by the clustering of discount rate around LAF data (z score) between zero and -2 with a threshold of 0.07, resulting on an average discount rate of 0.037 (figure 11). If the clustering is applied with a threshold of 0.06, respondents with dr data 0.0295 become close to a naïve investor, which can reach climate neutrality with a constant rate per year of 0.026. While 17% of neutral adverse respondents show a very low discount rate per annum of 0.011 which aligns with sophisticated investors, who reach carbon neutrality with a rate of 0.017. Loss neutrality is assumed as the reference point of the sample (or the status quo) because the curve here flexes from gains to losses. In a decision-making scenario involving a status quo, the agent selects the alternative that offers the highest utility after accounting for the cost of switching.⁴⁵² In this case, while the difference in the dr may be perceived as less favourable due to the potential loss associated with moving away from the status quo, subscribing a green investment will bring more profitability in the future, because protecting investors from possible losses due to climate change. Then, for loss neutral respondents reaching carbon neutral investment by being nudged out of their status quo towards a green investment will be convenient when at a very small cost. The choice architecture framework created for this questionnaire captures both status quo bias and other important behavioural factors effects to apply a green default.

4.1 GREEN DEFAULT

A green default is a kind of nudge that can be constructed through a choice architecture that clearly and transparently⁴⁵³ identify green choice options to be compared with the traditional policy instruments such as taxes and regulatory standards in feasibility and implementation. Since nudges are inherently context-dependent, the suitability and appropriateness of a green nudge must be assessed on a case-by-case

⁴⁵² Begum Guney and Michael Richter, 'Costly switching from a status quo' (2018) 156 *Journal of Economic Behavior & Organization* 55.

⁴⁵³ Pelle Guldborg Hansen and Andreas Maaløe Jespersen, 'Nudge and the Manipulation of Choice A Framework for the Responsible Use of the Nudge Approach to Behaviour Change in Public Policy' (2013) 4(1) *European Journal of Risk Regulation* 3.

basis to evaluate costs of switching from the status quo⁴⁵⁴ to reach a better positive outcome without excluding any option, which will be easy and cheap to avoid⁴⁵⁵. However, if switching options contribute to behavioural bias phenomena, it is essential to weight the superior benefits of the choice against the welfare implications of paternalistic policies⁴⁵⁶. Policies that assume institutions possibility and legitimacy to influence behaviour while still respecting individuals' freedom of choice. Legitimacy that in the case of a green default is supported by the green deal legally binding objective of climate neutrality, then making acceptable that governments and legislators can influence actions of those who are harming others by, such as an example, polluting or reducing community wellness by investing in short term actions disregarding climate change future impacts.

Nudge can be informative -called budge- when regulations grounded in behavioural economics are aimed at nudging the private sector away from actions that harm society. Behavioural economic factors, such as present bias, status quo reference, framing, loss aversion options transparency and disclosures etc. can help to make informed decisions to both regulate against harm and steer regulation against possible limitations⁴⁵⁷.

Otherwise, a default nudge, which only requires minimal changes in the choice architecture to become green or to be redesigned to be green⁴⁵⁸, is a possible solution to nudge investors toward green investments. This by including customisation to the behavioural economic factors of an informative nudge, to implement the all characteristic synthetically summarised by Lemken⁴⁵⁹ to also including ethical implications in nudging.

⁴⁵⁴ Fredrik Carlsson, Christina Gravert, Olof Johansson Stenman, and Verena Kurz, 'Nudging as an Environmental Policy Instrument' (2019) Working Paper Series 4 <<https://ssrn.com/abstract=3711946>> accessed 23 October 2024.

⁴⁵⁵ Richard H. Thaler and Cass R. Sunstein, 'Libertarian paternalism' (One Hundred Fifteenth Annual Meeting of the American Economic Association, Washington, DC, 2003) <<https://www.jstor.org/stable/3132220>> accessed 10 December 2024; Richard Thaler, 'The power of nudges, for good and bad' *The New York Times* (31 October 2015); Richard H. Thaler and Cass R. Sunstein, *Nudge: Improving decisions about health, wealth, and happiness* (The Penguin Group 2009).

⁴⁵⁶ Begum Guney and Michael Richter, 'Costly switching from a status quo' (2018) 156 *Journal of Economic Behavior & Organization* 55. This research analyses nudge and default concepts from the behavioural economics point of view, further research can be done on the topic from the paternalistic/philosophical approach to add further dept to the ethics factors of implementation summarised in paragraph 2.4.5 on default application.

⁴⁵⁷ Adam Oliver, 'From Nudging to Budgeting: Using Behavioural Economics to Inform Public Sector Policy' (2013) 42(4) *Journal of Social Policy* 685.

⁴⁵⁸ Fredrik Carlsson, Christina Gravert, Olof Johansson Stenman, and Verena Kurz, 'Nudging as an Environmental Policy Instrument' (2019) Working Paper Series 4 <<https://ssrn.com/abstract=3711946>> accessed 23 October 2024.

⁴⁵⁹ The six categories: i) choice architecture structure of default and active choice, ii) framing effects and costs, iii) psychological effects mechanisms: effort, cognitive bias, as loss aversion and implied endorsement – e.g. policy recommendations- iv) visibility of decision when a clear opt out possibility and

Customisation can be implemented by incorporating elements of self-reflection, which could be further strengthened within a nudge-plus framework⁴⁶⁰ or designing an effortless but market-oriented welfare-enhancing smart default⁴⁶¹.

Nudge plus combines a traditional nudge—such as a default option—with an active mechanism like a pledge. This approach encourages self-reflection on future choices, similar to how sophisticated investors challenge their decisions by considering their future selves. Unlike boosting, which aims to enhance individuals' ability to use heuristics more effectively, nudge plus provides individuals with greater ownership of their behaviour change process, fostering investor autonomy. While this added element distinguishes nudge plus from traditional nudges, its effectiveness remains unproven⁴⁶². Customising financial services nudges to promote self-reflection could involve integrating educational activities into the presentation of investment products. Additionally, since experience tends to reduce deviations from standard financial behaviour⁴⁶³, a targeted approach could be applied—offering pledges specifically to investors with higher financial literacy⁴⁶⁴. However, it is important to note that the impact of a default option diminishes as investors gain more knowledge and experience⁴⁶⁵.

This research evaluates the possibility to implement smart defaults, relying on consumer-specific data, some of which financial advisors and portfolio managers already possess⁴⁶⁶ (e.g., age, gender, investment history, employment etc.), together with the financial risk profile⁴⁶⁷ factors, to which other information may be specifically included to create the default⁴⁶⁸. To tailor the default then climate risk perception (LAF) and evaluation (dr) data can be added to facilitate the choice of a better outcome through the

alternative is shown , v) customisation and vi) disclosure. For more description on the implementation of these six categories in this research see paragraph 2.4.5 of chapter II.

⁴⁶⁰ Sanchayan Banerjee and Peter John, 'Nudge plus: incorporating reflection into behavioral public policy' (2021) 8(1) Behavioural Public Policy 69.

⁴⁶¹ N. Craig Smith, Daniel G. Goldstein and Eric J. Johnson, 'Choice Without Awareness: Ethical and Policy Implications of Defaults' (2013) 32 (2) Journal of Public Policy and Marketing 159.

⁴⁶² Sanchayan Banerjee and Peter John, 'Nudge plus: incorporating reflection into behavioral public policy' (2021) 8(1) Behavioural Public Policy 69.

⁴⁶³ Stefano Della Vigna, 'Psychology and economics: evidence from the field' (2009) 47 (2) J Econ Lit 315.

⁴⁶⁴ See paragraph for education pledges in information paragraph 2.3.1 chapter II

⁴⁶⁵ Åsa Löfgren, Peter Martinsson, Magnus Hennlock and Thomas Sterner, 'Are experienced people affected by a pre-set default option—Results from a field experiment' (2012) 63 (1) Journal of Environmental Economics and Management Elsevier 66.

⁴⁶⁶ N. Craig Smith, Daniel G. Goldstein and Eric J. Johnson, 'Choice Without Awareness: Ethical and Policy Implications of Defaults' (2013) 32 (2) Journal of Public Policy and Marketing 159.

⁴⁶⁷ See the suitability assessment for more information on paragraph 1.6.5 chapter I.

⁴⁶⁸ N. Craig Smith, 'Marketing Strategies for the Ethics Era' (1995) 36 Sloan Management Review 85.

use of a welfare-maximizing choice architecture to help investors in making a better (or less harmful) decision in an environment in which the financial advisor and portfolio manager are more familiar with. Then, financial advisors and portfolio managers have the knowledge to maximize investors' welfare and also the incentive to serve consumers' best interest⁴⁶⁹, two important characteristics to make a smart default, smarter by avoid misassignments of a simple one-size-fits-all traditional default⁴⁷⁰ because differences among investors will be accounted based on market knowledge to support the client for the best suitable choice. Smarter defaults by integrating consumer-specific data provided by the investor into the decision-making process, can also include information collected using choice architecture techniques customised as for the ethical implications model for a decarbonisation outcome.

4.2 QUESTIONNAIRE INTEGRATION TO MiFID II SUITABILITY ASSESSMENT

Despite the current legal framework in place for sustainability preferences assessment, legal proposals of disclosure reform are spurring to enlarge obligations to enable retail investors understanding and choice, by clearly labelling investment categories defined by minimum requirements and thresholds.⁴⁷¹ Currently consumer testing activities led to request language review and structure clarification of disclosures for retail investors understanding⁴⁷² to be also applied to define precise categories to serve investors' preferences. Then, sustainability preferences definitions by adjusting to the new categories will make the suitability assessment more predictable⁴⁷³ of which reporting data on client information should be on a standardised form and content upon the request of the retail client⁴⁷⁴. Data specifically collected by the firm for the suitability assessment, are the financial data collected by the holders who are the financial institutions,

⁴⁶⁹ See paragraph 1.2 and 1.7 of chapter I for general duty of financial institutions to act in the best interest of the client.

⁴⁷⁰ N. Craig Smith, Daniel G. Goldstein and Eric J. Johnson, 'Choice Without Awareness: Ethical and Policy Implications of Defaults' (2013) 32 (2) *Journal of Public Policy and Marketing* 159,177.

⁴⁷¹ David Ramos Muñoz, Marco Lamandini and Michele Siri, 'The Current Implementation of the Sustainability-related Financial Disclosures Regulation (SFDR)' (European Parliament, Luxembourg, 2024).

⁴⁷² ESAs Joint Committee, 'Final Report on draft RTS on the review of PAI and financial product disclosures in the SFDR Delegated Regulation' (JC 2023) 55

⁴⁷³ David Ramos Muñoz, Marco Lamandini and Michele Siri, 'The Current Implementation of the Sustainability-related Financial Disclosures Regulation (SFDR)' (European Parliament, Luxembourg, 2024).

⁴⁷⁴ As the Retail Investment Strategy amended art.25(1) MiFID II.

including investment firms, which are also the users having access to customer data⁴⁷⁵.

All the above will enable the authorities to play a key role in ensuring that relevant information reaches investors by identifying the type of information that is most easily recognizable also in digital form, making a nudge even more viable because through the use of technology. Furthermore, nudges will reduce costs (per individual) and improve investment scalability⁴⁷⁶.

Then a choice architecture instrument to be integrated in the MiFID II suitability assessment, as a guideline for financial institutions on how better evaluate and implement sustainability preferences and consequentially, offer suitable financial products in compliance with current European regulations and proposals is prepared by this research. Providing clients with an adequate financial instrument, means addressing sustainability through the adoption of a product-oriented model. However, this approach dissociates from the adoption of a client-oriented protection model which is currently pursued by the legislator to better protect investors⁴⁷⁷. To bridge this gap, a nudge application is suggested, because by clearly recognising and implement investors' values and interests in sustainability will increase protection. Preferences are the human capacity for reflective self-evaluation to rank desires,⁴⁷⁸ then revealed and fulfilled sustainability preferences will reflect and implement carbon neutrality as the desired investor's objective. This will allow individuals to become the drivers of green transformation in society and a vital participating force in the carbon market.

Furthermore, by making public participation instrumental⁴⁷⁹ to decarbonisation, a stronger patronage of the political objective of climate neutrality will be reached and democratic legitimacy of the objective

⁴⁷⁵ Commission Proposal for a Regulation of The European Parliament and of The Council on a framework for Financial Data Access and amending Regulations (EU) No 1093/2010, (EU) No 1094/2010, (EU) No 1095/2010 and (EU) 2022/2554.COM (2023) 360 final. Art 3 (6) j, 2(2) d.

⁴⁷⁶ Kim Ly, Nina Mazar, Min Zhao and Dilip Soman, 'A Practitioner's Guide to Nudging' (2013) Rotman School of Management Working Paper No. 2609347 <<https://ssrn.com/abstract=2609347>> accessed 10 December 2024.

⁴⁷⁷ Maria Elena Salerno, 'Adding Sustainability Risks and Factors to the MiFID II Suitability and Product Governance Requirements' (2022) 8 Italian Law Journal 803.

⁴⁷⁸ Harry G. Frankfurt, 'Freedom of the Will and the Concept of a Person' (1971) 68 (1) The Journal of Philosophy 5; Albert O. Hirschman, *Felicità privata e felicità pubblica* (3rd edition, trad. di Joseph Sassoon, Il Mulino, Bologna 2013) 171.

⁴⁷⁹ Francesca Colli, 'A Transition for the Citizens? Ensuring Public Participation in the European Green Deal' (2021) European Policy Briefs 68 (4) <<https://www.egmontinstitute.be/app/uploads/2021/04/EPB68.pdf?type=pdf>> accessed 2 February 2023.

improved. Certainly, policy decision makers are sensitive to the climate neutrality issues then essentially coordinating policy and institutional actions, which unfortunately will not be sufficient to protect and prepare countries to climate challenges. Broadening social support from citizens to both reducing emissions and strengthening the economic system is required to succeed in the implementation of the important transformational process of the economy launched by the green deal and the Paris agreement.

4.3 THE QUESTIONNAIRE AS EMPIRICAL SOLUTION

The questionnaire created for this thesis/project/contribution – and convalidated through the process of testing, finalising, disseminating and proofing against research hypothesis - can then be seamlessly integrated into the suitability assessment to facilitate the choice for sustainable financial products. The analysis of questionnaire responses aims to uncover preferences and perception biases in evaluating sustainability preferences. This knowledge supported the development of bias mitigation strategies for financial institutions, ensuring investors can make the best choices regarding sustainable financial instruments. Ultimately, the validated questionnaire aims to empower investors to make informed decisions that have positive impacts on climate, environment, and society through their investment choices.

The questionnaire tested the conceptual framework for investors' green values evaluation, and the related behaviour bias mitigation actions identified in chapter II highlighting the following implementation results:

1. That sustainability evaluation influences sustainability assessment as the sustainability synthetic value including the two data scored differently that the absolute assessment and the evaluation. Respondents selected an objective and then invested in another one which was, probably, considered more profitable. Then it is suggested to also include the question about portfolio allocation to have real investor's preference revealed.
2. The environmental objectives prioritisation calculated as correlation within themselves is always negative and values goes from weak to moderate. Also, correlations within the objectives and the economic actions belonging to the three domains are run, with the same results (a part of being consistently positive between the action and the represented related objective). Then the above choices elaborated with tasks 1 and 2 are considered not influenced by prioritisation,

having the synthetic data representing more significantly investors preferences. Furthermore, the above tasks are based on descriptions of the economic actions extracted from the taxonomy representing each objective implementation on three different domains. Then formulating questions using a simpler language to explain in practice how an objective can be transformed in an economic action is considered more successful than showing the objectives itself it.

3. The calculation and use of LAF values is considered significant because most of respondent answers fell on the neither agree nor disagree quintile, which suggests the possibility to influence these respondents with a green default⁴⁸⁰.
4. The above information is supported by the discount factors calculation which shows a present bias in the short term, and theoretical values for a sophisticated investors investing in green investments aligned with neutral loss averse profiles. However, the calculation of a discount factor to be added to the MiFID II questionnaire is not suggested as it will be influenced by the presentation of financial instruments in which to invest done by the financial advisors. Furthermore, the scattered data resulted from the answers suggested that a good level of financial literacy is needed to have values economically significant. This is also why average data have been analysed in paragraph 3.4.2.4.
5. The overall bias mitigation techniques implementation as explained in paragraph 2.4 and following subparagraph, are the guidelines to be implemented to have a questionnaire that can support a smarter⁴⁸¹ default to be implemented.

Extracted from table 8 are below selected (table 19) the best action descriptions to represent the environmental objectives of the taxonomy across the three domains to be applied in task 1 and 2.

Table 19: Best environmental actions

the reduction of greenhouse gas emissions (GHG) by restoring wetlands and forestlands and creating new carbon sinks.	Mitigation
the reduction of its own climate vulnerability by operating and maintaining infrastructure that permanently stores CO2.	Adaptation

⁴⁸⁰ See paragraph 3.5.1 above for more detailed information on default possible implementation.

⁴⁸¹ This on a scale to be considered as traditional nudge, smart nudge and smarter nudge. See paragraph 3.5 and related subparagraphs for more information.

the sustainable use and protection of water by operating an urban drainage system that removes hazardous chemicals.	Water
the transition to a zero-waste economy by manufacturing product packaging from recycled, non-chemical raw materials.	circular economy
the prevention of pollution by adopting integrated and end-of-pipe technologies that reduce CO ₂ emissions.	Pollution prevention
the protection of biodiversity by actively contributing to nature conservation by avoiding indirect harm such as chemical pollution littering.	Biodiversity

Source: Elaborated by the author

Task 3 of sustainability objective prioritisation should be excluded and task 4 of loss aversion question should include the 8 sentences (table 20) of the adapted Li et al. scale to be scored in a Likert scale. While discount rate calculation can be avoided, as explained above, making the final questionnaire of only three tasks.

Table 20: LAF descriptions

When making a green investment decision, I think much more about what might be lost than what might be gained.
The fact that my green investment lost performance matters more than if it earned the same performance.
I feel nervous when I have to make a green investment decision that may lead to loss.
The pain from losing on a green investment matter much more to me than the pleasure from gaining on it.
Avoiding failure of green investments is less important to me than seeking success of green investments.
The experience of a major loss on a green investment stays in my mind longer than a major gain.
A potential green investment failure scares me more than a potential success encourages me.
The disappointment that comes with losses on green investments cannot be offset by the pleasure that comes from gains.

Source: Elaborated by the author

The integration of the above questionnaire into the suitability assessment, along with accurately capturing investors' sustainability preferences, will also serve as a choice architecture tool to mitigate investors' biases against green investments. Although, a questionnaire could potentially perpetuate the "another questionnaire" problem, through the conceptual framework analysis of respondent behavioural bias and mitigations regarding financial behaviour, includes information overload and financial literacy examination. Whilst framing includes language and information amount, financial literacy is considered by the fact that only less literate investors will accept a green default⁴⁸². As for the calculation of the discount factor for a new sample, further research is suggested to test data through the application of the game theory. This to calculate a suboptimal equilibrium describing the interrelation investor-advisor, which will refine the discount value by adding information on investors investment choices.

By accurately capturing investor preferences, investors are empowered to support decarbonization in line with their own goals, promoting better investment decisions and greater public engagement in climate action. Furthermore, through this choice architecture model, policymakers and regulators can guide neutral or undecided investors toward personalized green investment solutions by offering tailored, behaviour-based choices, ultimately aligning investment decisions with both sustainability preferences and decarbonization targets as described in paragraph 4.1 of green default. Additionally, by aligning financial products with clearly defined investor values, compliance with European regulations is enhanced, and investor protection is strengthened, shifting the suitability assessment from a product-centred instrument toward a client-centred protection model.

⁴⁸² See paragraph 2.3.1