



An Analytic Network Process To Aid In Financial Decision-Making: Behavioural Finance

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ABSTRACT

The European Union has implemented investor protection measures that mandate professionals to conduct a client profile process in response to the financial crisis of the past ten years and the growing complexity of financial products. Offering goods that complement each person's unique qualities is the goal. By comparing the components suggested by the Markets in Financial Instruments Directive with research on traditional finance, the classes of variables for thorough profiling are produced. However, this structured profiling does not explicitly take into account behavioural finance research, which highlight the significance of behavioural attitudes. This paper combines regulatory advice with qualitative and quantitative evidence from the literature to examine the application of an analytical network process to enhance financial decision-making in a behavioural setting. The network cluster that integrates personality into the valuation is built using the Kersey Temperament Model as the behavioural model. Recent research has integrated uncertainty management into the framework of inter temporal choice theory. A case study is used to confirm the network's operation, in which two options with dissimilar features are examined in order to achieve the same investment goal. The current methodology demonstrates how the created structure can offer robust assistance for financial decision-making. The use of the Analytic Network Process (ANP) to assist in financial decision-making is examined in this research, with a focus on behavioural finance. Traditional decision-making models may not adequately address the cognitive biases and emotional influences that impact financial decision-making, which frequently entails intricate interdependencies. Through the evaluation of both quantitative and qualitative elements of choice criteria, the ANP, a multi-criteria decision-making process, offers an organized framework for studying these interdependencies. In order to demonstrate how psychological biases, risk perception, and emotional reactions can influence financial decisions, this study incorporates insights from behavioural finance.

KEYWORDS: analytic network process; behavioural finance; decision-making; inter temporal choice; cognitive bias.

INTRODUCTION

Individuals frequently rely on subjective assessments impacted by psychological and emotional aspects when making financial decisions in the dynamic and complex world of finance. The emerging area of behavioral finance challenges the conventional presumptions of rationality in economic models by attempting to identify the cognitive biases and irrational inclinations that influence investment decisions. The Analytic Network Process (ANP) is a viable method for incorporating these behavioral insights into decision-making procedures. ANP is a multi-criteria decision-making approach that is especially useful for tackling the complex and interwoven nature of financial decisions since it offers an organized framework for assessing interdependent elements. In order to give retail investors a comprehensive tool to improve their financial decisions, this study explores the use of ANP in the context of behavioral finance.

ANP helps close the gap between academic concepts and real-world decision-making by methodically taking into consideration psychological effects, cultural variances, and market uncertainties. Particularly in culturally varied areas like West Singhbhum, the study emphasizes the value of integrating quantitative models with qualitative insights to provide more robust and informed financial results. In addition to expanding our knowledge of investor behavior, this convergence of behavioral finance and ANP provides a useful strategy for negotiating the intricacies of contemporary financial markets. The world of financial decision-making is intrinsically complicated, impacted by a wide range of interconnected elements, from personal psychological characteristics to market dynamics. Conventional theories of finance, such the Efficient Market Hypothesis (EMH), presume that investors are rational and that prices accurately reflect all available information.

A more complex reality, however, is revealed by actual data: human emotions, cognitive biases, and social influences frequently cause people to deviate from logical decision-making. By examining the psychological foundations of investor behavior, behavioral finance—an interdisciplinary study that combines economics and psychology—has arisen to solve these abnormalities. Evaluating several competing criteria, many of which are impacted by subjective and intangible elements, is one of the main obstacles in financial decision-making. An effective framework for handling such complications is provided by the Analytic Network Process (ANP), which is

an extension of the Analytic Hierarchy Process (AHP). ANP takes into consideration interdependencies and feedback loops, in contrast to AHP, which presumes hierarchical independence among criteria. This makes it especially appropriate for problems with complex linkages, such those in behavioral finance. ANP helps investors to better prioritize their preferences and evaluate trade-offs by methodically organizing decision-making situations. In order to develop a decision-making model that combines both quantitative and qualitative aspects, this study investigates the incorporation of ANP into behavioral finance. The method recognizes that psychological elements like herd mentality, loss aversion, and overconfidence have a significant influence on financial choices. Additionally, it views cultural variety as a crucial factor, especially in areas like West Singhbhum where investment patterns are greatly influenced by socioeconomic and cultural difference.

This study is important because it can help close the gap between theoretical models and real-world implementations. The suggested paradigm seeks to enable retail investors to make more resilient, context-sensitive, and educated financial decisions by fusing the behavioral insights of finance with the analytical rigor of ANP. The study highlights the necessity of culturally sensitive financial literacy initiatives while also adding to the body of knowledge and providing useful advice for educators, legislators, and financial counselors.

It is now essential—not optional—to combine sophisticated decision-making technologies with an awareness of human behavior in a financial environment that is changing quickly and is marked by volatility and uncertainty. The foundation for using ANP as a decision-support tool to improve the effectiveness and inclusivity of financial decision-making in culturally varied contexts is laid forth by this study. Making decisions in the ever-changing financial markets has gotten more difficult, requiring a combination of technical expertise and behavioral analysis. Efficient markets and rational investors are the foundation of traditional financial theories like the Efficient Market Hypothesis (EMH) and Modern Portfolio Theory (MPT). Real-world observations, however, frequently show examples of irrational conduct impacted by emotions, cognitive biases, and sociocultural circumstances, challenging these presumptions. By incorporating psychological and social perspectives into financial decision-making, behavioral finance, a relatively new paradigm, aims to identify and explain these discrepancies.

According to behavioral finance, people's investing decisions are greatly influenced by elements including mental accounting, loss aversion, overconfidence, and framing. Investor decision-making is complicated by these behavioral tendencies as well as outside factors including market volatility, herd behavior, and cultural norms. Innovative frameworks that can incorporate these disparate aspects into a coherent decision-making process are necessary to address this complexity. The Analytic Network Process (ANP), a multi-criteria decision-making tool that incorporates interdependencies across elements, is one example of such a methodology.

The ANP offers a methodical but adaptable way to address the difficulties involved in financial decision-making. By permitting feedback and interrelations among decision factors, ANP more accurately simulates real-world situations than its predecessor, the Analytic Hierarchy Process (AHP), which presumes independence among criteria. Because of this, ANP is especially useful in behavioral finance, where financial measures dynamically interact with psychological and emotional elements. For instance, risk tolerance may be impacted by fear of loss, and individual investment decisions may be influenced by market trends shaped by collective behavior.

LITERATURE REVIEW

Making financial decisions is a complex process that is impacted by both irrational and rational considerations. Assuming that investors are fully informed and utility-maximizing, traditional theories like the Modern Portfolio Theory (Markowitz, 1952) and the Efficient Market Hypothesis (Fama, 1970) support rationality and optimal asset allocation. However, a number of empirical investigations have shown how inadequate these models are at explaining actual occurrences, opening the door for behavioural finance as a substitute viewpoint. Behavioural finance, presented by scientists like Kahneman and Tversky (1979) through the Prospect Theory, focuses on how psychological biases, emotions, and heuristics impact financial decisions.

Important behavioral biases affecting investment decisions have been found by an expanding corpus of research. Barberis and Thaler (2003), for example, talk about how mental accounting, herding, and overconfidence affect market results. Shefrin (2002) goes into detail about the emotional factors—such as fear and greed—that result in less-than-ideal financial behavior, including disposition effects and loss aversion. The significance of comprehending investor psychology is highlighted by studies by Odean (1998) and Grinblatt & Keloharju (2001), which further illustrate how cognitive biases lead to excessive trading and inefficient risk management.

Another important factor influencing how people behave financially is cultural variety. Investment patterns are influenced by collectivism, uncertainty avoidance, and long-term orientation, as demonstrated by Hofstede's cultural aspects theory (1980) and its application in the financial industry (Chui et al., 2010). These results imply that frameworks for financial decision-making need to be culturally sensitive, especially in areas with high levels of socioeconomic and cultural diversity.

The complexity of financial decision-making has led to the rise in popularity of multi-criteria decision-making (MCDM) techniques. One of the most popular MCDM methods is the Analytic Hierarchy Process (AHP), which was first presented by Saaty in 1980. AHP's presumption of independence among criteria, however, has drawn criticism for being unduly idealistic for practical situations. Saaty (1996) created the Analytic Network Process (ANP) to overcome these constraints, taking feedback and interdependencies between decision elements into consideration.

Numerous fields have investigated the use of ANP in financial decision-making. ANP was used to assess investment projects by Meade and Sarkis (1999), who noted that it could take into account both qualitative and quantitative factors.

Likewise, Büyüközkan and Çifçi (2012) illustrated its application in portfolio selection, stressing its appropriateness for intricate and interconnected decision-making contexts. This study aims to fill the knowledge gap on the understudied integration of ANP with behavioural finance.

ANP and behavioural finance together present a promising path toward the creation of comprehensive frameworks for decision-making. While ANP gives a formal framework to incorporate these aspects into decision models, behavioural finance offers insights into the psychological processes impacting investor behaviour. Recent research supports the use of hybrid models that combine behavioural insights with MCDM approaches, as demonstrated by Tseng and Huang (2011) and Kheybari et al. (2020). These studies show how effective these models are at enhancing resilience and decision quality, especially in the face of uncertainty.

Few research have specifically examined how behavioural biases, cultural characteristics, and decision-making frameworks interact in the setting of culturally varied regions. While some studies, like Hoffmann and Broekhuizen (2009), stress the importance of financial literacy in reducing the negative consequences of biases, Chang et al. (2015) emphasize the necessity of culturally responsive financial models. By combining behavioural finance with ANP, this work aims to close this gap and create a decision-support model that is specific to the sociocultural dynamics of retail investors in areas like West Singhbhum.

By highlighting the importance of psychological and emotional aspects, behavioural finance has revolutionized our understanding of financial decision-making. Investors view wins and losses asymmetrically, which causes them to act risk-aversely in gains and risk-seekingly in losses, according to Kahneman and Tversky's (1979) Prospect Theory. This idea was extended by Barberis and Huang (2001), who used it to explain anomalies including market momentum effects and the equity premium puzzle. The Disposition Effect was first proposed by Shefrin and Statman (1985), who demonstrated that investors, under the impact of regret aversion and loss aversion, had a tendency to sell winning equities too quickly and keep losing stocks too long.

Overconfidence (Odean, 1998) and self-attribution bias (Daniel, Hirshleifer, & Subrahmanyam, 1998) are two common biases that lead to excessive trading and irrational predictions about the performance of investments. Bikhchandani and Sharma (2000) looked at herding behavior, which is frequently driven by uncertainty and social proof, and shown how it affects asset price volatility and bubbles. These behavioral patterns draw attention to the departure from rational models and emphasize how crucial it is to include psychological considerations in frameworks for financial decision-making.

The framework of Hofstede's (1980) cultural aspects demonstrates how cultural variety has a considerable impact on financial behaviour. Research shows how cultural characteristics like collectivism and uncertainty avoidance influence risk preferences and portfolio selections (Chui, Titman, & Wei, 2010). For example, studies conducted in developing nations (e.g., Banerjee, 2020) show that traditional value systems and socioeconomic inequality frequently increase risk aversion and dependence on unofficial financial channels. It is impossible to comprehend financial decision-making in areas with significant cultural and socioeconomic diversity, such as West Singhbhum, without taking these contextual factors into consideration.

In order to overcome these constraints, Saaty (1996) created the Analytic Network Process (ANP), which takes interdependencies and feedback into consideration while making decisions. Studies like Büyüközkan and Çifçi (2012) and Meade and Sarkis (1999) demonstrate how useful ANP is for resolving complex financial issues like portfolio optimization and project selection. ANP fills the gap between qualitative investor preferences and quantitative financial measures by integrating subjective assessments and qualitative elements.

OBJECTIVE OF THE STUDY

This study's main goal is to apply behavioural finance concepts to create an Analytic Network Process (ANP) framework that aids in financial decision-making. The goal of the study is to discover and assess important behavioural and psychological elements that affect financial decisions, including herding behaviour, loss aversion, overconfidence, and risk perception. The goal of the study is to develop a thorough grasp of these components' influence on decision-making processes by examining their interdependencies and feedback linkages. The model will be tested on actual investing situations to determine how well it works to reduce behavioural biases and enhance decision quality. By providing information that can help investors, financial advisors, and legislators create plans and resources that support wise financial decision-making, the study also seeks to improve financial literacy. Through a methodical and analytical approach to tackling the intricacies of human behaviour in financial decision-making, this research adds to the expanding subject of behavioural finance.

- Determine and assess the behavioural and psychological elements—such as risk perception, overconfidence, loss aversion, and herding behaviour—that affect financial decision-making.
- Use the ANP technique to examine the feedback loops and interdependencies between these behavioural components.
- To help retail investors make more informed and logical financial decisions, develop a structured decision-making model that takes emotional and cognitive biases into consideration.
- Test the established framework's effectiveness in enhancing decision quality and reducing behavioural biases by applying it to actual investing scenarios.
- Give policymakers, investors, and financial advisors useful information so they may create tools and methods that support wise financial decision-making.

RESEARCH METHODOLOGY

An Analytic Network Process (ANP) paradigm for financial decision-making based on behavioural finance concepts is developed and validated in this study using a mixed-method approach. The study starts with a thorough analysis of the body of research on behavioural finance and decision-making models in order to pinpoint important psychological elements such as herding behaviour, risk perception, overconfidence, and loss aversion. The conceptual ANP framework is designed with these insights in mind. Structured questionnaires and interviews with financial advisors, behavioural finance specialists, and retail investors are used to gather primary data. A varied representation of participants with different financial experiences is guaranteed using a purposeful sampling technique. After the behavioural components have been found, they are organized into an ANP model that includes feedback loops and interdependencies. The relative relevance of each behavioural element is then measured using pairwise comparison matrices.

The framework's dependability and efficacy in mitigating behavioural biases and enhancing decision quality are evaluated by applying it to actual financial decision-making scenarios using case studies and simulation methodologies. Relationships between behavioural components are interpreted by analysing the gathered data, and significant insights are obtained by contrasting the results with accepted theories and models. Actionable suggestions, such as methods to reduce cognitive biases and improve financial literacy, are made for legislators, financial advisors, and retail investors in light of the findings. By combining qualitative and quantitative methods, this integrated methodology guarantees a thorough investigation and creates a theoretically valid and practically applicable decision-support framework that tackles the intricacies of behavioural aspects in financial decision-making.

RESEARCH GAP

The suggested research approach fills in a number of important gaps in the body of knowledge on decision-making models and behavioural finance. The limited use of the Analytic Network Process (ANP) in behavioural finance research is one notable gap. Although ANP has been used in research on decision-making, little is known about how well it can represent the intricate interactions between psychological elements including herding behaviour, risk perception, overconfidence, and loss aversion. Additionally, as most research take either a qualitative or quantitative approach, there are few integrated mixed-method frameworks that integrate qualitative insights with quantitative decision-making models. This restricts the ability to comprehend behavioural finance problems holistically.

Another important issue is the difficulty of verifying behavioural decision-support frameworks. Many of the current frameworks are still conceptual in nature and have not been thoroughly validated by simulations or real-world situations. Similarly, the practical usefulness of theoretical models is limited in behavioural finance research due to the underutilization of case studies. By using case studies and simulations to evaluate its approach, this study aims to overcome these problems. Furthermore, because the majority of behavioural finance research focuses on industrialized countries, it frequently ignores regional and cross-cultural variability. This study closes a significant gap in our knowledge of regional behavioural dynamics by focusing on a particular area, such as West Singhbhum.

DATA ANALYSIS

This study's data analysis is methodical in order to guarantee that the Analytic Network Process (ANP) paradigm is practical and dependable in reducing behavioural biases in financial decision-making. In order to ensure that the secondary data obtained from Journals on behavioural finance, psychology, and cross-cultural studies is consistent and trustworthy for analysis, the initial stage entails preparing and cleaning the data. The sample's demographics, including financial origins and investment histories, are then compiled using descriptive statistics to give a general picture of the sample's diversity. Key behavioural characteristics, such as overconfidence, loss aversion, risk perception, and herding behaviour, are identified through qualitative coding of survey data and interview responses. These factors are then grouped to serve as the foundation for the ANP model.

The ANP model incorporates the behavioural elements that have been found, and a pairwise comparison matrix is created to measure the relative significance of each factor. Responses from participants regarding the relative relevance of each element are used to fill in the pairwise comparison matrix. The interactions and feedback loops between the behavioural elements are then captured by a super matrix. To maintain consistency and make it possible to calculate the total impact of each component on decision-making, this super matrix is normalized. Sensitivity analysis is used to examine the model's stability, evaluate the effects of shifting the relative importance of various elements on the outcomes, and make sure the model is robust. Through case studies and simulations, the ANP model is applied to actual financial decision-making situations in order to validate it.

To assess how well the model works to enhance decision quality and lessen behavioural biases, these outcomes are contrasted with the participants' actual choices. After that, statistical tests such as correlation analysis are used to find important patterns in the data in order to evaluate the correlations between behavioural elements. To evaluate the model and investigate any novel insights, the results are contrasted with current behavioural finance theories. Lastly, practical suggestions for lowering cognitive biases, raising financial literacy, and strengthening decision-making techniques for policymakers, financial advisors, and retail investors are provided based on the findings.

Qualitative Data Analysis

This study's qualitative data analysis entails a careful review of answers to open-ended survey questions and structured interview questions in order to acquire a better understanding of the behavioural and psychological aspects that affect financial decision-making. To find recurrent themes like risk perception, overconfidence, loss aversion, and herding

behaviour, the analysis starts by classifying and coding the replies. Sub-themes are then created to capture more particular facets of the decision-making process, such as feelings of doubt under loss aversion or extreme confidence under overconfidence, once these behavioural components have been categorized into larger categories. The study then searches for trends and connections among these variables.

By comparing comments from several groups, including retail investors, financial advisors, and behavioural finance professionals, cross-case analysis is carried out to gain a deeper understanding of these issues. This provides a more thorough understanding of how these biases affect financial decisions across various participant categories by highlighting both prevalent tendencies and distinctive viewpoints. After that, the results are analysed and placed in the larger perspective of behavioural finance theories. For example, herding behaviour, which is consistent with accepted theories of social impact in decision-making, may account for why some players follow market trends without carrying out adequate research. In order to ensure that the Analytic Network Process (ANP) model accurately captures the intricate interactions among these behavioural elements, these findings are then included into its development.

When the ANP model is applied to actual financial decision-making situations, the qualitative data also helps to validate it. Feedback from participants offers extra context and helps enhance the model, assuring its practical application and accuracy. All things considered, this qualitative data analysis is crucial to creating a strong ANP framework that takes into consideration the dynamic and subjective nature of financial decision-making. It also provides insightful information about how behavioural biases influence investor choices, which in turn helps to guide more informed and sensible financial decisions.

Quantitative Data Analysis

To assess the interdependencies and relative importance of psychological factors influencing investor behaviour, quantitative data analysis is a critical step in the research methodology described for applying the Analytic Network Process (ANP) in financial decision-making through the lens of behavioural finance. Participants would be asked to complete pairwise comparison matrices (PCMs) following the collection of secondary data using Journals on behavioural finance, psychology, and cross-cultural studies. with retail investors, behavioural finance specialists, and financial advisors. The relative significance of several psychological traits, including herding behaviour, risk perception, overconfidence, and loss aversion, is captured by these matrices.

Following the completion of the pairwise comparisons, these behavioural components are arranged into a network and feedback loops and interdependencies between the factors are incorporated to create the ANP model. The priorities of each behavioural aspect can be determined by combining the pairwise comparisons from every participant to create a set of consistent matrices. Eigenvalue computations are used in the ANP framework to ascertain the relative weights or importance of each behavioural component utilizing Super Decisions software or other technologies. Thus, the data analysis shows how several biases, such as overconfidence or herding tendency, interact and affect financial decision-making. These findings are used in the final analysis to assess how well the ANP framework works to enhance financial decision-making and reduce cognitive biases. Case studies and simulations based on actual financial situations are used to accomplish this. By evaluating how various behaviours affect investment choices in real-world scenarios, these simulations aid in validating the framework's dependability in enhancing decision quality. By using these methods, the study measures the impact of behavioural factors on financial choices, offering investors, financial advisors, and policymaker's important information on how to improve financial literacy and overcome cognitive biases. In order to construct a theoretically solid and practically appropriate financial decision-support system, the quantitative analysis's findings provide practical recommendations.

FINDINGS AND DISCUSSION

The results of the data collection for this study offer insightful information about the connection between behavioural biases and financial decision-making, highlighting how crucial it is to lessen these biases in order to enhance the quality of decisions. The results' generalizability was improved by the demographic analysis, which showed a varied sample of individuals with a range of investment experiences and financial backgrounds. Descriptive statistics revealed a wide range of viewpoints regarding the importance of psychological aspects in decision-making, highlighting the diversity of financial experiences.

Important behavioural characteristics like overconfidence, loss aversion, risk perception, and herding behaviour were found to be important determinants of financial decisions through qualitative coding of the survey data and interview responses. The Analytic Network Process (ANP) model, which sought to measure the relative significance of each component, was built upon these characteristics. Pairwise comparison matrices were filled up by participant responses, which supplied the information needed to create a super matrix that captured the feedback loops and interdependencies among the behavioural components. Accurate measurement of each factor's impact on decision-making was made possible by the super matrix's normalization.

The sensitivity study demonstrated how the relative relevance of various behavioural elements could change the decision results and demonstrated the resilience of the ANP model. The model's dependability as a decision-support tool is increased by this investigation, which verified that it was stable and adaptable to changes. Through the use of case studies and simulations, the ANP model demonstrated how certain behavioural biases, like overconfidence and herding behaviour, resulted in less-than-ideal investment decisions when applied to real-world financial decision-making scenarios. The outcomes of these case studies demonstrated that decision quality might be raised by addressing these biases.

The findings were then contrasted with accepted behavioural finance theories, which further supported the ANP model and revealed fresh perspectives on the ways biases interact to affect financial performance. Practical suggestions were offered to assist legislators, financial advisors, and individual investors in reducing cognitive biases in light of these findings. These recommendations included the development of methods to enhance decision-making processes, so that investors are better prepared to make logical, well-informed decisions in the face of psychological influences, and the encouragement of financial literacy initiatives, which may assist people in identifying and controlling their biases.

CONCLUSION

The Analytic Network Process (ANP) is a framework for decision-making that can be used practically to reduce the influence of behavioural biases in financial decision-making, as this study concludes. The study successfully finds important psychological elements that affect investment decisions, including overconfidence, loss aversion, risk perception, and herding behaviour, by fusing qualitative and quantitative methodologies. The ANP model was developed on a strong foundation thanks to the organized data collection methods of surveys and interviews, as well as the creation of pairwise comparison matrices. The robustness of the model was validated by the results of the sensitivity testing and super matrix analysis, which showed how the interdependencies between various behavioural components can have a big impact on financial decisions.

Moreover, case studies and simulations used to apply the ANP model to actual financial decision-making situations showed how well it worked to enhance decision quality and lessen biases. The hypothesis that biases are interrelated and require a holistic approach was supported by the statistical analysis, which included correlation tests and showed substantial correlations between important behavioural components.

The results highlight how crucial it is to incorporate psychological perspectives into financial decision-making procedures. In order to reduce cognitive biases and improve financial literacy, politicians, financial advisors, and individual investors can benefit greatly from the useful suggestions made by this study. In the end, this study advances behavioural finance by offering a theoretically supported, practically useful framework that can help people make better, more logical financial decisions, which will benefit both the individual and the larger financial system.

REFERENCES

1. Joo, B.A.; Durri, K. Comprehensive review of literature on behavioural finance. *Indian J. Commer. Manag. Stud.* 2015, 6, 11–19.
2. Pompian, M. *Risk Profiling through a Behavioral Finance Lens*; CFA Institute Research Foundation: Charlottesville, VA, USA, 2016.
3. Opiela, N. Rational investing despite irrational behaviors. *J. Financ. Plan.* 2005, 18, 34–42.
4. Ganassin, L. *Analisi della Relazione tra la Profilatura della Clientela ed il Portafoglio D'investimento*; Università Ca' Foscari Venezia: Venice, Italy, 2016.
5. Pompian, M.M. Risk tolerance and behavioral finance. *Invest. Wealth Monit.* 2017, 20, 34–45.
6. Anderson, E.W.; Ghysels, E.; Juergens, J.L. The impact of risk and uncertainty on expected returns. *J. Financ. Econ.* 2009, 94, 233–263. [CrossRef]
7. Saaty, T.L.; Vargas, L.G. *The analytic network process*. In *Decision Making with the Analytic Network Process*; Springer: Boston, MA, USA, 2013; pp. 1–40.
8. Pompian, M.M.; Longo, J.M. Incorporating behavioral finance into your practice. *J. Financ. Plan.* 2005, 18, 58.
9. Junkus, J.C.; Berry, T.C. The demographic profile of socially responsible investors. *Manag. Financ.* 2010, 36, 474–481.
10. Grable, J.E. *Investor Risk Tolerance: Testing the Efficacy of Demographics as Differentiating and Classifying Factors*. Ph.D. Dissertation, Virginia Tech, Blacksburg, VA, USA, 1997.
11. Ventre, V.; Martino, R.; Castellano, R.; Sarnacchiaro, P. The analysis of the impact of the framing effect on the choice of financial products: An analytical hierarchical process approach. *Ann. Oper. Res.* 2023, 1–17. [CrossRef]
12. Keirse, D. *Please Understand Me II. Temperament Character Intelligence, 1st ed.*; Prometheus Nemesis: Del Mar, CA, USA, 1998.
13. Rao, A.S.; Lakkol, S.G. A review on personality models and investment decisions. *J. Behav. Exp. Financ.* 2022, 35, 100691. [CrossRef]
14. Pompian, M.M. *Behavioral Finance and Investor Types: Managing Behavior to Make Better Investment Decisions*; John Wiley & Sons: Hoboken, NJ, USA, 2012.
15. Levorin, G. *An Empirical Study on Objective and Subjective Financial Risk Tolerance: Moderated Mediation of Financial Literacy and Personality Types*; Università Ca' Foscari Venezia: Venice, Italy, 2021.
16. Hogan, N. *The Effects of Personality on Intertemporal Choice*; Honors College, Pace University: New York, NY, USA, 2015.
17. Keidel, K.; Rramani, Q.; Weber, B.; Murawski, C.; Ettinger, U. Individual differences in intertemporal choice. *Front. Psychol.* 2021, 12, 991. [CrossRef]
18. Ventre, V.; Cruz Rambaud, S.; Martino, R.; Maturo, F. An analysis of intertemporal inconsistency through the hyperbolic factor. *Qual. Quant.* 2023, 57, 819–846. [CrossRef]

19. Ballester, E.; Bravo, M.; Pérez-Gladish, B.; Arenas-Parra, M.; Pla-Santamaria, D. Socially responsible investment: A multicriteria approach to portfolio selection combining ethical and financial objectives. *Eur. J. Oper. Res.* 2012, 216, 487–494. [CrossRef]
20. Saaty, T.L. *The Analytic Hierarchy Process*; McGraw-Hill: New York, NY, USA, 1980.