



Lisbon School
of Economics
& Management
Universidade de Lisboa

**MASTER OF SCIENCE IN
FINANCE**

**MASTERS FINAL WORK
PROJECT**

**INVESTMENT POLICY STATEMENT FOCUSED ON
SUSTAINABILITY:
OLIVEIRA FAMILY**

JOÃO ANTÓNIO ALVES BOAVENTURA

OCTOBER 2023



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SUPERVISOR SOFIA SANTOS

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Abstract

This Investment Policy Statement serves as a mean to communicate effectively with Family Oliveira, the client, and design an investment strategy to obtain the investment objective.

The family decided to invest over a period of 15 years to finance their 3-year-old son's future education with some specific constraints of only investing in European companies and in Euros. They also demanded no short selling and a maximum loss of 10% in one year.

Since the couple considered that they would need 180.000 EUR in today's money, the final value that the portfolio needs to have, taking into account a 2,2% inflation rate during the next 15 years and a 28% tax rate over gains, is set to be 319.278 EUR.

The investment strategy used in the portfolio was a combination of a Sustainable Responsible Investment (SRI) with an ESG-based investment to comply with the values of the client in being environmentally friendly in their investments.

The Strategic Asset Allocation was made with the usage of the Mean-Variance Theory to minimize the Variance while limiting the Carbon Intensity of the portfolio to 20 tCO₂/Revenues(in Millions). This resulted in a Final Portfolio with 10,65% expected annual return and 3,31% variance.

To evaluate the risk of the investment, the advisor, João Boaventura, used the Monte Carlo VaR simulation and designed a Risk Matrix with future possible risks.

JEL classification:C6; G11

Keywords: Asset Management; Portfolio Theory; IPS; Carbon Intensity; ESG; CFA

Resumo

Este Documento de Política de Investimento serve como um meio eficaz de comunicação com a Família Oliveira, o cliente, e para projetar uma estratégia de investimento para atingir o objetivo de investimento.

A família decidiu investir ao longo de um período de 15 anos para financiar a futura educação do filho de 3 anos, com algumas restrições específicas de investir apenas em empresas europeias e em Euros. Eles também exigiram que não haja vendas a descoberto e uma perda máxima de 10% em um ano.

Uma vez que o casal considerou que precisaria de 180.000 EUR em dinheiro atual, o valor final que a carteira precisa de ter, levando em consideração uma taxa de inflação de 2,2% nos próximos 15 anos e uma taxa de imposto de 28% sobre os ganhos, foi definido em 319.278 EUR.

A estratégia de investimento usada na carteira foi uma combinação de Investimento Responsável Sustentável (SRI) com um investimento baseado em critérios ambientais, sociais e de governança (ESG) para estar alinhado com os valores do cliente de ser um investidor amigo do ambiente.

A Alocação Estratégica de Ativos foi feita com o uso da Teoria de Média-Variância para minimizar a Variância, ao mesmo tempo em que foi limitava a Intensidade de Carbono da carteira a 20 tCO₂/Receitas (em Milhões). Isso resultou em uma Carteira Final com um retorno anual esperado de 10,65% e uma variância de 3,31%.

Para avaliar o risco do investimento, o consultor, João Boaventura, usou a simulação de VaR (Valor em Risco) de Monte Carlo e projetou uma Matriz de Risco com possíveis riscos futuros.

Classificação JEL: C6; G11.

Palavras-Chave: Gestão de Activos; Teoria da Carteira; IPS; ESG; Intensidade de Carbono; CFA

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Table of Contents

Abstract	i
Resumo	ii
Acknowledgments	iii
Table of Contents	iv
Abbreviations	vi
List of Figures	vii
List of Tables	viii
1 Executive Summary	1
1.1 Scope and Purpose	1
1.2 Governance	1
1.3 Investment Return and Risk	1
1.4 Risk Management	1
2 Investment Policy Statement	2
2.1 Scope and Purpose	2
2.1.1 Context	2
2.1.2 Investor	2
2.1.3 Structure	2
2.2 Governance	3
2.3 Investment, Return, and Risk Objectives	4
2.3.1 Investment objective	4
2.3.2 Return and Risk	4
2.3.3 Investor's Risk Tolerance	4
2.3.4 Relevant Constraints	5
2.3.5 Other Considerations	6
2.4 Risk Management	6
3 Investment Design	8
3.1 Investment Philosophy	8
3.2 Strategic Asset Allocation	11
3.2.1 Europe Market Outlook & ESG Analysis	11
3.2.2 ESG Investment Outlook	12
3.2.3 Asset Distribution	13

3.3	Security Selection	14
3.4	Portfolio Composition	17
3.4.1	Modern Portfolio Theory (MPT)	17
3.4.2	Data & Approach	17
3.4.3	Methodology	18
3.4.4	Portfolio Composition	20
3.5	Expected Performance	24
3.6	Risk Analysis	26
3.6.1	Historical VaR & Monte Carlo VaR	26
3.6.2	Risk Matrix	28
	Appendices	30
	Appendice 1. Client's Profile	30
	Appendice 2. Profiling Questionnaire	31
	Appendice 3. Portfolio Composition	33
	Appendice 4. Securities Description	34
	References	35
	Disclosures and Disclaimer	38

Abbreviations

\bar{R} – Average Annual Return

R_f – Risk Free Rate

\bar{R}_{MV} – Minimum Variance Portfolio Average Return

\bar{R}_p – Final Portfolio Average Return

\bar{R}_v – Risky Final Portfolio Average Return

σ_p^2 – Final Portfolio Annual Variance

SR_v – Risky Final Portfolio Srape Ratio

v_i – Carbon Intensity

AI – Artificial Intelligence

CFA – Chartered Financial Analyst

EF – Efficient Frontier

ESG – Environmental, Social and Governance

EUR - Euro

IPS – Investment Policy Statement

MPT – Modern Portfolio Theory

MV – Minimum Variance

MVT – Mean-Variance Theory

REIT – Real Estate Investment Trust

SR – Sharpe Ratio

VaR – Value at Risk

RL – Return level

MSCI - Morgan Stanley Capital International

ECB – European Central Bank

CO2 – Carbon dioxide

List of Figures

Figure 1. Reuters Calculation of the ESG Grade Score	9
Figure 2: Scope 1, 2 & 3 Emissions description	10
Figure 3: ECB Interest Rates & Eurozone Inflation Evolution	11
Figure 4: ESG Net Flows	13
Figure 5: Decline in Standard Deviation with Increasing Diversification	15
Figure 6: Volatility & Return Portfolios	22
Figure 7: Benchmark vs Risky Final Portfolio Weekly	24
Figure 8: Benchmark vs Risky Final Portfolio vs Final Portfolio Past Performance	25
Figure 9: Distribution of Annual Returns	27
Figure 10: Risk Matrix	29

List of Tables

Table 1: Selected Stocks	16
Table 2: Carbon Intensity by Company	21
Table 3: Carbon Intensity Comparison	23
Table 4: Final Portfolio Overview	24
Table 5: Historical Simulation vs Monte Carlo Simulation	26
Table 6: Potential risks that can impact the portfolio.	28

1 Executive Summary

1.1 Scope and Purpose

The financial advisor uses this Investment Policy Statement (IPS) as a mean of communicating effectively with family Oliveira. Within this role, João Boaventura is responsible for keeping the IPS updated in terms of taxes and legal aspects, as well as updating the portfolio in accordance with the client's needs. For this, the advisor is committed to deliver impartial guidance, transparently disclosing any conflict of interests while adhering to the regulations of the CFA (Chartered Financial Analyst).

1.2 Governance

In order to attain the return goal of the client with the restrictions given by the client, the financial advisor is responsible for creating an IPS and rebalancing the investment so it can comply with the client's objective. The family is responsible for overseeing the monthly report and comment on it.

1.3 Investment Return and Risk

This IPS is designed to obtain an average annual return of 10,65% over the next 15 years with the restriction of only using stocks and a risk-free asset.

The Final Portfolio was created with the goal of having the exact expected return objective while minimizing the variance. The Mean-Variance Theory by Markowitz was used to obtain the most optimal asset distribution resulting in a portfolio with 3.31% variance.

1.4 Risk Management

The financial advisor will report monthly, the risk and return of the portfolio, and will rebalance the portfolio in order to get the objective return with the minimum variance possible.

2 Investment Policy Statement

2.1 Scope and Purpose

2.1.1 Context

The financial advisor, João Boaventura, uses this Investment Policy Statement (IPS) as a way of building a long-term investment plan for his client, Mr. and Ms. Oliveira, that have been saving money over the years and is their intention to invest 70.000 EUR of the money that they saved to pay for their 3-year-old son's education when he turns 18.

2.1.2 Investor

This IPS governs the personal savings of the family constituted by Mr. Manuel Oliveira, Ms. Maria Oliveira, and their 3-year-old son, João Oliveira. This Portuguese couple has been together for 10 years and married for 5 years and both work in the health industry. Manuel Oliveira, 35, is a physiotherapist and has been working in the same clinic for the past 9 years. Maria Oliveira, 34, works as a medical doctor in a well-known hospital, she has been working there for the past 2 years but she has a long-term contract that provides a certain stability.

2.1.3 Structure

João Boaventura, as the financial advisor of the family, is responsible for monitoring and updating the Investment Policy Statement in order to comply not only with the objectives of the couple but also to be aligned with the inputs of the legal and tax advisers of the couple. For this matter, the advisor is tasked with the responsibility of communicating all the revisions made in the portfolio during the period of investment. Manuel and Maria Oliveira shall be responsible for approving the Investment Policy Statement and all future revisions to it.

As an advisor, João Boaventura functions as a fiduciary and recognizes that all advices and decisions provided should primarily serve the best interests of his clients.

He further confirms his commitment to upholding the principles outlined in the CFA Institute Asset Manager Code of Professional Conduct.

The portfolio will be managed exclusively by João Boaventura and all the trustees of the family shall be designated to him and so, he shall have exclusive authority to invest in name of the couple.

The advisor is responsible for monitoring the investment risks and performance of the investment and so, he will provide a monthly report for Mr. and Ms. Oliveira so that the couple stays updated during the investment.

João Boaventura will adhere to the CFA Institute Asset Manager Code of Professional Conduct in order to provide an ethical financial advisory.

2.2 Governance

João Boaventura is primarily focused on following the client's interests as outlined in this Investment Policy Statement by creating a clear framework of roles and duties that allows the family to monitor all the portfolio management activities.

As an independent financial advisor, João Boaventura is in charge of making all the recommendations in the formulation of this IPS and shall make all the necessary changes to meet the investment objective. A monthly report to evaluate performance will serve as a method to evaluate the performance of their investment and monitor if it is under the wishes of the clients.

Both Manuel and Maria Oliveira delegate exclusive authority to the financial advisor to choose other entities or advisor to help him construct and monitor the portfolio. Prior to the hiring of these entities or external advisors, João Boaventura shall communicate his intention to do so.

On a semi-annual basis, João Boaventura is responsible for conducting a comprehensive analysis of the asset allocation of the investment, resulting in a potential revision of the portfolio with the authorization of Mr. and Ms. Oliveira. This potential revision of weights will be in accordance with the expected return objective, risk performance of the portfolio, and all the constraints put by the couple seen in sections 2.3.4. and 2.3.5..

A benchmark will be continuously used as a comparison for the portfolio risk and return assessment and the financial advisor is responsible for supervising and reporting this comparison.

2.3 Investment, Return, and Risk Objectives

2.3.1 Investment objective

This investment program, presented in this IPS, intends to maximize the wealth of family Oliveira in order to generate enough money so that when their 3-year-old son turns 18, be able to freely choose where he wants to keep studying in college. This means that this investment has a term of 15 years and since the family considers that their son might choose another country where education is more expensive, they have as their return goal 180.000 EUR in today's money.

2.3.2 Return and Risk

Considering the family's objective of accumulating 180,000 EUR, factoring in a 2.2% inflation rate over the next 15 years, the required amount by the couple would be approximately 249,480 EUR. However, it's important to note that this amount accounts for returns after taxes. To achieve this return, considering a 28% tax rate in Portugal, the final portfolio value needs to reach 319,278 EUR. Therefore, to attain the return objective within the 15-year timeframe while accounting for taxes on gains, the portfolio should generate a return of at least 10.65%. This return target is crucial in ensuring that the family's financial goals are met while also addressing tax obligations.

The portfolio manager, to obtain these returns, will make all the necessary distributions in terms of assets and risk-free asset, so that the final return can be achieved with the lowest possible risk.

2.3.3 Investor's Risk Tolerance

For the Risk Tolerance analysis of the client, the advisor used an "Investor questionnaire" provided by Vanguard that contemplates a set of 10 questions in order to understand what is the position of the family in terms of investment time horizon, risk tolerance, investment goal, and investing experience. Depending on the final

score of the questionnaire, the investment recommendation is one of the following: Income Investment Mix, Balanced Investment Mix, or Growth Investment Mix.

From the first three questions, it could be retained that the family wants a long-term investment. From questions 4., 5., 6., 8., and 9., we can retain that the couple prefers certainty in returns and stability over the possibility of obtaining more results. From the remaining questions is clear that both are inexperienced in the stock market and have a stable resource of income.

Given the risk-averse characteristics of the couple, and as seen in Appendix 2, the couple got a final score of 35 points out of the 10 questions. This means that João Boaventura shall prioritize an Income Investment Mix of around 30% in stocks and 70% in bonds. Of course, the advisor adapted this recommendation to the assets chosen and the investment objective required, obtaining a final distribution of 36.37% in Stocks and 63.63% in the Risk-Free Asset.

2.3.4 Relevant Constraints

The investment advisor will furnish the Oliveira family with a comprehensive monthly report that includes a detailed account of all portfolio transactions, along with an extensive performance analysis of each asset class.

Before addressing the constraints in the investment put by the couple, is it important to notice that in Portugal, as a general rule, capital gains will be subject to tax at a flat rate of 28%.

Coming from a Portuguese family, the first constraint the couple emphasized to the advisor is their preference for having their investments concentrated in Europe. This implies a preference for investing exclusively in European companies and holding European Bonds or Treasury Bonds. Furthermore, they prefer not to be exposed to other currencies and only invest in Euros. This preference arises from their observation of heightened volatility between the Euro and USD in recent months.

In terms of liquidity, given the family's stable income source, they are comfortable with the practice of reinvesting all dividends and interest income generated by their investments. This approach aligns with their long-term investment objectives and financial strategy.

Additionally, the family wants to exclude real estate investments from the portfolio due to their existing holdings in this sector.

Finally, the family leans towards a conservative long-term strategy and aims to allocate no less than 60% of their funds to a robust European treasury bond with the condition of avoiding more than 10% loss in one year in the portfolio.

2.3.5 Other Considerations

Manuel and Maria Oliveira hold a strong belief that the environmental decisions we make today can significantly impact the future. As a result, they are committed to contributing to a carbon-neutral future and making a positive environmental impact.

To align with their environmental goals, the family is decided to exclude companies associated with the tobacco, alcohol, weapons, and fossil fuels industries from their investments. They also wish to adopt an ESG (Environmental, Social, and Governance) philosophy in their investment approach, emphasizing companies that demonstrate strong ESG performance. Additionally, the couple requests that João Boaventura provides regular reports on how the portfolio is influencing the environment in terms of carbon emissions.

As the investment advisor for the Oliveira family, João Boaventura is authorized to vote in all proxies to maximize the values of the family's underlying investments while adhering to the couple's ESG values. Specific instructions from the family will be provided to guide these voting decisions.

Furthermore, the family insists on excluding any investment strategies involving short-selling or leverage from this IPS, emphasizing a more conservative and risk-averse approach.

2.4 Risk Management

João Boaventura, the advisor, is responsible for delivering a monthly report that must provide a comprehensive overview of the performance of each asset within the portfolio. These performance calculations shall adhere to the Global Investment Performance Standards published by the CFA Institute.

The monthly report will also include a detailed analysis of the portfolio's risk performance over the past six months. This risk assessment will involve calculating

the weekly standard deviation of the past six months in comparison to the benchmark, as well as computing the Sharpe Ratio. Additionally, various risk measurements using VaR (Value at Risk) metrics will be included to assess the portfolio's risk exposure.

The financial advisor is also tasked with proposing a rebalancing of the portfolio. This proposal will be presented during the first week of the semester. After receiving approval from Mr. and Ms. Oliveira, João Boaventura will execute the rebalancing within two business days.

3 Investment Design

3.1 Investment Philosophy

Based on the family's profile and their financial investment restrictions, the most appropriate investment philosophy to follow is the Socially Responsible Investment (SRI) strategy. According to Forbes (2023), this strategy aims to achieve positive social and environmental impacts while simultaneously striving for positive returns.

According to Eurosif (2021), there are 7 different approaches within this strategy: Best in Class, Engagement & Voting, ESG Integration, Exclusions, Impact Investing, Norms based screening, and Sustainable themed.

For this investment design, it is applied a set of different approaches within this strategy with the objective of aligning the portfolio and the family's investments with a net-zero future.

The Exclusions approach, which involves the removal of specific investments or classes of investments from the investible universe, such as companies, sectors, or countries, is applied. The family's preference is to exclude any investments related to fossil fuels, tobacco, or the weapons industry, leading to their exclusion from the universe of stocks for this investment.

To complement this strategy, ESG Integration is employed to assess the overall performance of each company in terms of ESG factors. As the family desires companies that actively engage in positive causes and exhibit improvements in ESG matters, the Best in Class approach is used to select stocks with the highest ESG Grade Scores. In this regard, only stocks with an A Grade, as determined by Thomson Reuters, are included in the portfolio.

According to Amon et al. (2021), screening does not significantly reduce financial performance, allowing investors to adjust their portfolio to align with environmental objectives while still achieving their desired returns. The same author suggests that an effective method for constructing an environmentally friendly portfolio is to combine screening with an environmental-scoring-based asset allocation.

To emphasize the benefits of incorporating this set of strategies, S&P Global (2020) provides a brief explanation of the differences between these approaches and how

they can complement one another. The Exclusions approach, as mentioned earlier, primarily employs negative screening when selecting investments, with financial returns taking a backseat to the investor's moral values. On the other hand, ESG integration through the ESG Score provides a different perspective on other risks a company might face concerning Social, Environmental, or Governance factors, helping the investor in mitigating these risks. Furthermore, as reported by the same source, ESG Integration in portfolio management experienced a significant 69% growth over two years, from 2016 to 2018.

Thomson Reuters ESG Scores have been meticulously designed to provide an impartial and straightforward assessment and evaluation of each company's commitment to ESG. The score given to each company is computed through an evaluation of 10 different ESG categories, relying on data provided by the companies themselves (Figure 1).

Pillar	Category	Indicators in Rating	Weights	Pillar Weights
Environmental	Resource Use	19	11%	(11%+12%+11%)
	Emissions	22	12%	
	Innovation	20	11%	
Social	Workforce	29	16%	(16%+4.5%+8%+7%)
	Human Rights	8	4.50%	
	Community	14	8%	
	Product Responsibility	12	7%	
Governance	Management	34	19%	(19%+7%+4.5%)
	Shareholders	12	7%	
	CSR Strategy	8	4.50%	
TOTAL		178	100%	

Figure 1. Reuters Calculation of the ESG Grade Score

Source: Reuters

Regarding an environmental investment philosophy, the screening related to the ESG Score can be redundant since only 34% take environmental aspects into consideration. Therefore, to fully align with the couple's values of having a "green" portfolio, a limitation on the portfolio's carbon emissions is also implemented by the financial advisor.

The Green House Gas Protocol, implemented in 2001, categorizes the type of emissions of each company as 3. The Scope 1 emissions are the emissions that the company makes directly, from owned and controlled sources. The Scope 2 emissions

are those that the company makes indirectly from the generation or purchased energy. Scope 3 emissions are all indirect emissions (except Scope 2) that occur in the value chain of the company.

For the calculation of the portfolio's carbon footprint, the financial advisor takes into account the Scope 1 and Scope 2 emissions, in metric tonnes of CO₂, from each selected company, divided by the Sales (in Millions) of the corresponding year.

This method of exclusively using emissions corresponding to Scope 1 and Scope 2, as explained by Bloomberg (2022), is due to the fact that Scope 3 emissions estimates are, on one hand, not as widely reported as Scope 1 & 2 emissions. On the other hand, the data reported to Scope 3 emissions may not be as must consistent as the other two, since companies have more flexibility in calculating associated emissions to this category. The figure 2 illustrates the 3 Scopes.

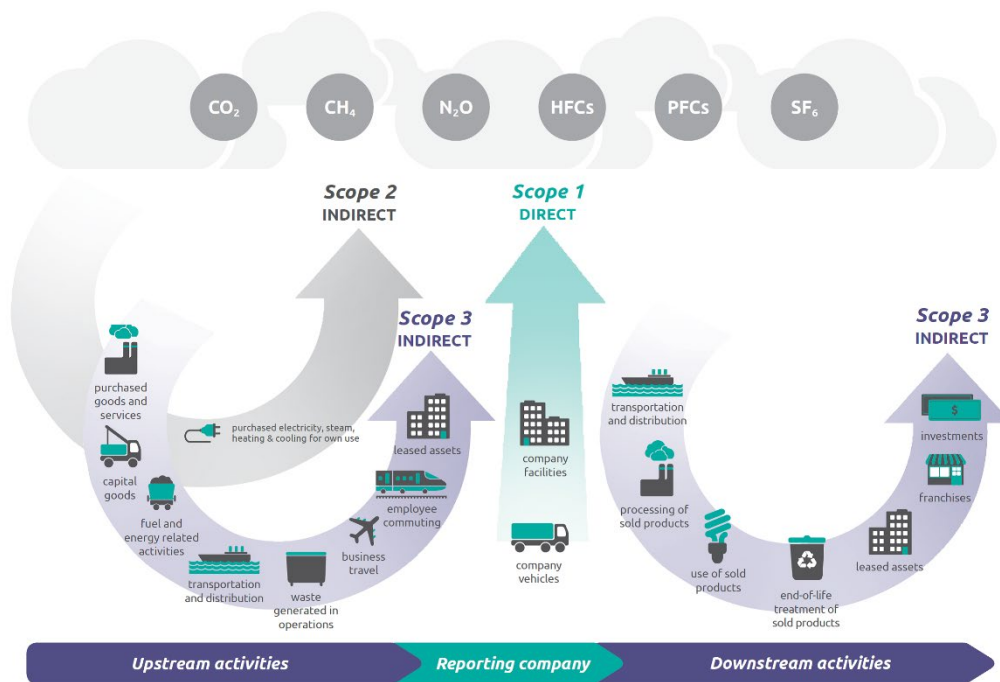


Figure 2: Scope 1, 2 & 3 Emissions description

Source: Reuters

3.2 Strategic Asset Allocation

Strategic asset allocation, as defined by Vanguard (2022), involves establishing specific return and risk objectives and subsequently rebalancing the multi-asset portfolio to maintain alignment with these goals. This strategy is designed for the long term and aims to mitigate the temptation to make tactical adjustments to the portfolio during periods of heightened market volatility. In the context of this Investment Policy Statement, the return objective is set at 10.65%, with a primary focus on minimizing risk.

3.2.1 Europe Market Outlook & ESG Analysis

The last months have been marked by the rises in interest rates by the Federal Reserve (Fed) and by the European Central Bank (ECB) to control the rise in inflation that was seen after the start of 2022. The ECB decided to raise their benchmark deposit rate to 3,75% on the latest update, in July 2023. Even though the inflation in the Eurozone is already declining, Christine Lagard says that these levels of interest rates might rise depending on future economic data.

According to JP Morgan (2023), it is expected that the inflation globally will stay above 3% until the end of the year, caused by the pressure that we are still feeling in terms of demand.

Since this IPS is mostly focused in assets located in the Eurozone, it is important to focus more on the macroeconomic view in terms of the Eurozone.

According to Eurostat (2023), the annual inflation in June 2023 was 5,5%, expected to lower to about 5,2% in August 2023. This is a descendant tendency that has been constant since the second half of 2022 after the energy prices reached their peak.

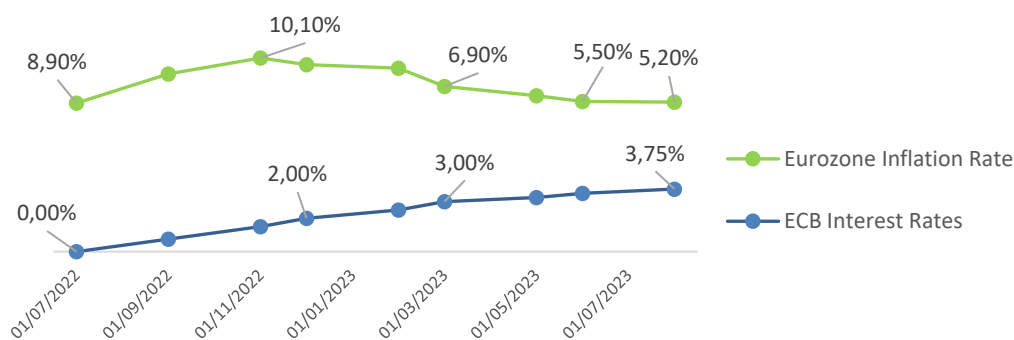


Figure 3: ECB Interest Rates & Eurozone Inflation Evolution

Source: ECB

According to a JP Morgan (2023) report, the forecast of inflation for the next 10 to 15-year time horizon is set to be around 2,20%.

In terms of equities, JP Morgan released a Stock Market Forecast that predicts that the MSCI Eurozone will have a -3% from July 2023 until December 2023. Explaining that, even though the period of more pressure is already behind us, there are signs that consumers are starting to show weakness. ECB is still increasing the interest rates and with that, putting more pressure on consumers and increasing the cost of lending.

3.2.2 ESG Investment Outlook

ESG Investing has had a significant impact on the world of finance, with the philosophy of considering Environmental, Social, and Governance factors gaining tremendous momentum in recent years. This anticipated growth in the coming years emphasizes the importance of integrating ESG principles into investment portfolios. This approach is considered exceptional for risk reduction, as it facilitates the identification of sustainable and well-governed companies. This, in turn, minimizes vulnerability to market shifts, legal issues, and reputational harm. ESG-aware investing aligns with long-term sustainability, providing a more robust risk assessment.

According to Broadridge (2021), asset managers play a crucial role in driving the growth of the ESG industry. They are instrumental in delivering the investment outcomes they promise to their investors while directing capital toward ESG investments.

Projections suggest that the assets allocated to dedicated ESG funds could increase from US\$8 trillion in 2021 to US\$30 trillion by 2030. Despite the desire to achieve a net-zero future, it has proven to be more complex than initially anticipated since the costs associated with transitioning to a greener future have been on the rise in recent months. In response, Europe has implemented a set of regulations aimed at accelerating investments and transitions to sustainability. These measures and regulations are already yielding positive results, as illustrated in figure 4.

ESG Fund Net Flows \$bn

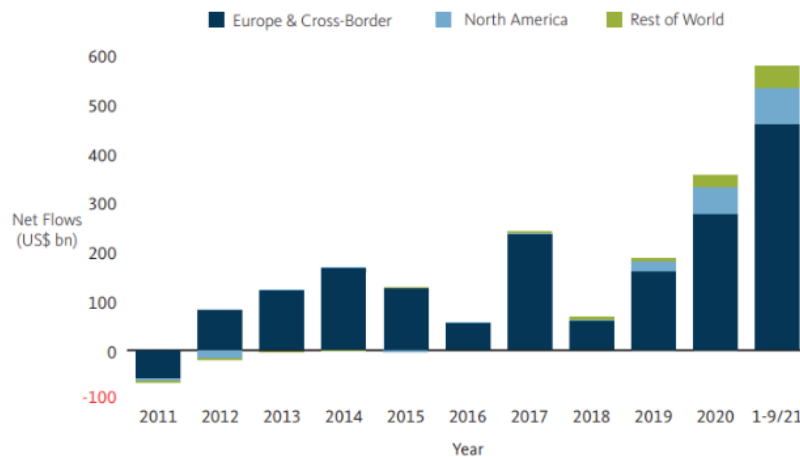


Figure 4: ESG Net Flows

Source: Broadridge Global Market Intelligence 2021 data. Excludes money market funds and fund of funds. Does not include institutional mandates or private funds

Much of this growth can be attributed to the evolution of ESG Investing from an attractive commercial opportunity to a demanded requirement. Fund managers now face due diligence that requires evidence of their adherence to specific ESG criteria. This shift reflects a broader recognition of the importance of sustainability and responsible investing practices, as investors increasingly prioritize ESG considerations when making financial decisions.

3.2.3 Asset Distribution

The asset allocation for this portfolio is based on a research from Fang et al. (2018), which tests the construction of a sustainable portfolio with carbon intensity restrictions. In order to achieve this, the portfolio is developed using Markowitz Mean-Variance portfolio optimization aiming to minimize the overall risk while meeting the target annual return of 10.65%. Additionally, a limitation on Weighted Average Carbon Intensity of 20 metric tonnes of CO₂ per 1 Million euros of sales is integrated into the portfolio's design to ensure that it aligns with environmental responsibility and sustainability goals.

João Boaventura uses this threshold value as an effective mean to harmonize the investment with the family's environmental goals. As explained in section 3.2.2, the risks stemming from regulations and market dynamics in Europe are on the rise. Therefore, constructing a portfolio less exposed to these risks may be positive.

This value is significantly lower than the Weighted Average Carbon Intensity of 58.8 observed in the EUROPE LOW CARBON LEADERS Index in 2021, which serves as the benchmark for this comparison. This highlights the strong commitment of the portfolio manager to align with the investment strategy of Mr. and Ms. Oliveira. Furthermore, this value is intended to allocate the weights of the stocks across the selected companies that are making substantial contributions to a net-zero future, thereby reinforcing the family's dedication to environmentally responsible investing.

Without imposing any restrictions on the allocation between risky assets and risk-free assets, the final step involves distributing capital between these categories to meet the targeted return objective. This approach allows for flexibility in achieving the desired balance between risk and return, ensuring that the portfolio aligns with the family's investment goals while optimizing the potential for meeting the specified return target.

3.3 Security Selection

In this section of the IPS, the portfolio manager primarily uses the Refinitiv Eikon App from Thomson Reuters, applying filters to screen stocks that conform to the constraints specified in section 2.3.4 of this IPS.

The initial step in the security selection process involves applying a set of rules within the Refinitiv Eikon screening to meet the family's restrictions and reduce the available stock universe. Given the family's preference for equities traded in Euros and companies headquartered in Europe, the first two filters implemented by the financial advisor are "Country of Headquarters: Europe" and "Currency: EUR."

After putting these two restrictions, João Boaventura employs the SRI strategy referenced in section 3.1 of this IPS. He uses one first industry variable (GICS Industry Name) to pull out all the equities related to "Oil, Gas & Consumable Fuels", "Gas Utilities", "Tobacco" and "Metals & Mining". Following this negative screening process, all stocks included in the portfolio must possess an ESG Grade Score from Thomson Reuters of A, A-, or A+ to align with the values of Mr. and Ms. Oliveira.

According to the risk profile of the investors and also with the large time horizon of the investment, Large and Mega-Cap stocks provide a much more steady and secure

investment and so, consequently, the minimum market cap of each company of the portfolio is 10 billion euros.

The final step in this initial process of narrowing down the universe of stocks involves eliminating those stocks that exhibit a negative Sharpe Ratio (SR). The SR used for this analysis is provided by Refinitiv Eikon (Monthly Sharpe Ratio – 5 Year) and is calculated using monthly Price Close change values, with a minimum requirement of 40 monthly Price Close change values within the 5-year trading period.

Following this stage of security selection, the number of available stocks for consideration is reduced to 109.

According to Gerard A. Moerman (2008), given the harmonization of the European Union, it is now more efficient to prioritize industry diversification over country diversification. This shift is attributed to the increasing correlation among financial markets in Europe, making industry-based diversification a more favorable strategy.

In alignment with this approach, João Boaventura chooses to select, if possible, at least two stocks from each sector represented in the universe of screened stocks up to the specified date. Out of the 109 stocks in the universe, they were categorized into nine distinct sectors, excluding REITs (Real Estate Investment Trust), since the couple mentioned that they have already investments in real estate of their own.

According to Bloomfield et al. (1977), the diversification that the portfolio obtains from having a number of equities higher than 20 becomes more and more insignificant as it can be seen in the figure 5. Hence, the portfolio manager's objective is to maintain a minimum of 15 and a maximum of 20 stocks within the portfolio. This range is selected to strike a balance between diversification and practical manageability.

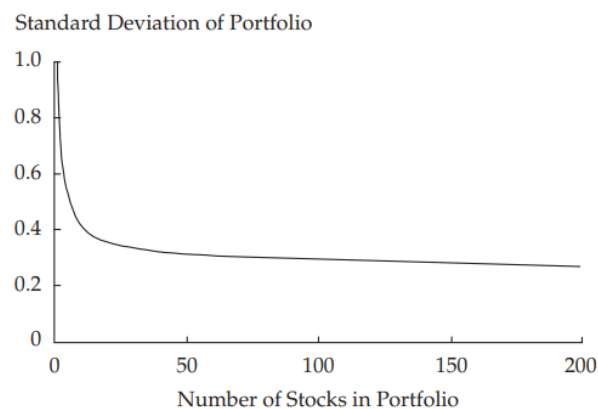


Figure 5: Decline in Standard Deviation with Increasing Diversification

Source: Statman (2004)

In this initial stock selection phase, João Boaventura takes the Sharpe Ratio of each stock into account, striving to choose at least the two companies with the highest Sharpe Ratio in each sector. In the process, there is some screening to ensure that there is adequate data available for each stock's Close Price over the last 5 years in Euros.

Following the screening process outlined above, the portfolio manager has successfully chosen 18 investments from 9 different sectors, namely Communication Services, Consumer Discretionary, Consumer Staples, Financials, Health Care, Industrials, Information Technology, Materials, and Utilities. It's important to note that all of the companies selected by João Boaventura in this section have their headquarters in a European country and their investments are made in Euros. However, this does not eliminate the currency risk entirely, as these companies may still have operations or expenses in other currencies. Consequently, the portfolio's financial advisor is responsible for monitoring and managing these currency-related risks.

<i>Sector</i>	<i>Company Common Name</i>	<i>Country of Headquarters</i>
Communication Services	Cellnex Telecom SA	Spain
Communication Services	Publicis Groupe SA	France
Consumer Discretionary	LVMH Moet Hennessy Louis Vuitton SE	France
Consumer Discretionary	Industria de Diseno Textil SA	Spain
Consumer Staples	L'Oreal SA	France
Consumer Staples	Jeronimo Martins SGPS SA	Portugal
Financials	3i Group PLC	United Kingdom
Financials	Banco Bilbao Vizcaya Argentaria SA	Spain
Health Care	Sartorius AG	Germany
Health Care	Novo Nordisk A/S	Denmark
Industrials	Ferrovial SE	Netherlands
Industrials	Schneider Electric SE	France
Information Technology	ASML Holding NV	Netherlands
Information Technology	Infineon Technologies AG	Germany
Materials	CRH PLC	Ireland; Republic of
Utilities	Iberdrola SA	Spain
Utilities	EDP Renewables SA	Spain
Utilities	Enel SpA	Italy

Table 1: Selected Stocks

Source: Author

3.4 Portfolio Composition

3.4.1 Modern Portfolio Theory (MPT)

For the final computation of the weights of each portfolio, this IPS follows an optimization strategy developed by Markowitz (1952) that states that the investor should consider Return a desirable thing while considering Variance an undesirable thing.

According to Beyhaghi et al. (2013), the Modern Portfolio Theory (MPT) provides a solution that specifies which is the combination of available assets that maximizes the expected return given the correspondent risk associated with the combination, or, on the other side, minimizes the variance of the portfolio.

According to the same source, the Modern Portfolio Theory (MPT) is based on a set of assumptions. However, the key assumption relevant to this IPS is that the investor is risk-averse. Consequently, if the expected returns of two portfolios are the same, the risk-averse investor will always prefer the portfolio with the lowest risk.

According to Sharpe (1964), in the equilibrium, when investors choose their portfolio based on risk and return and the opinion on each asset's expected return, risk and correlations are the same, there is a linear relationship between the expected return and its sensitivity to the return on the market portfolio.

3.4.2 Data & Approach

After the process of security selection, to calculate the standard deviation and expected return of each stock chosen, it is necessary to obtain all the closing prices for each stock of the last 5 years. The data used for this purpose is the Daily Adjusted Price between 22/08/2018 and 21/08/2023, and it was downloaded from the YahooFinance! (2023) platform.

The approach of incorporating carbon intensity as a constraint leads to the computation of the final portfolio's carbon footprint. To achieve this, it is necessary to acquire the Scope 1 and Scope 2 emissions data from each company's Sustainable Report. The data used for this purpose was the most recent data available. Some companies had as their last report the 2021 Sustainable Report, and for the

computation of the carbon intensity (v_i), it was used the revenues from the corresponding year.

The Formula used to compute the carbon emissions from each company is the following:

$$v_i = \frac{\text{Company' Scope 1 + 2 GHG Emissions (tCO2)}}{\text{Company's Revenue (Million €)}}$$

3.4.3 Methodology

After obtaining all the data, the first step is to calculate the Average Annual Return (\bar{R}) of the last 5 years for each stock as well as the Standard Deviation (σ) and Variance (σ^2) to construct the Variance Covariance Matrix.

The Hyperbola of the graph, given by the equation below, is to trace the Efficient Frontier. The Efficient Frontier is the combination of portfolios between the Minimum Variance (MV) Portfolio and the portfolio with the highest return.

$$\sigma_p^2 = \frac{A\bar{R}_p^2 - 2B\bar{R}_p + C}{AC - B^2}$$

where

$$A = 1'V^{-1}1$$

$$B = 1'V^{-1}\bar{R}$$

$$C = \bar{R}'V^{-1}\bar{R}$$

V = Variance Covariance Matrix of the Assets

The Minimum Variance (MV) Portfolio provides the portfolio of the Hyperbola Equation where the variance is minimized and all the points in the Hyperbola below it are not efficient because there is another portfolio with the same risk but a higher expected return. To compute the MV portfolio, the Excel Solver Add-in was used with the restriction of having all positive stock weights while minimizing the variance.

After having the assets allocation of each asset, to compute the return of the MV Portfolio (\bar{R}_{MV}) and the volatility (σ_{MV}^2) the following formulas were used:

$$\bar{R}_{MV} = X'_{MV}\bar{R}$$

$$\sigma_{MV}^2 = X'_{MV}VX_{MV}$$

After this first step, to trace the Tangent Line, also called the Capital Allocation Line (CAL), which is the line created in the graph that gives all the possible combinations between the risk-free asset and risky assets, it was used the same technique as for MV portfolio but now to maximize the SR. This will give the portfolio that lies tangent to the Efficient Frontier (EF) given only no short selling restrictions.

Before advancing to the optimal portfolio with restriction in terms of carbon intensity, Roy's safety-first criteria was applied. According to Roy (1952), the optimal portfolio is the one that minimizes the probability of the annual return of the portfolio falling below the limit loss that the portfolio should have (R_L). According to the Family's questionnaire, the threshold level (R_L) was at -10%, so the Roy portfolio is given by:

$$\min \Pr (R_p < R_L)$$

$$R_L = -10\%$$

Note that, all the portfolios located to the right/below the Safety-First Criteria line in the graph don't obey to the Roy criteria.

As mentioned in section 3.1 of this IPS, the financial advisor and the family agreed to put a limit of 20 in the Weighted Average of the Portfolio's Carbon Intensity (v_p), given by the following expression:

$$\sum_n^i \left(\frac{\text{Current Value of Investment}}{\text{Portfolio Value}} * \frac{\text{Company' Scope 1 + 2 GHG Emissions (tCO2)}}{\text{Company's Revenue (Million €)}} \right)$$

Given this positive screening method, and since the investors are both risk-averse, to find the portfolio that satisfies the carbon footprint requirements it was used Excel

Solver Add-in to find the combination of assets with the lowest Volatility (σ_p^2) and a carbon footprint lower than 20 tCO₂/Revenues(M€).

The CAL correspondent to the portfolio that minimizes volatility and has a limit of 20v_i is the above:

$$\bar{R}_v = R_f + SR_v \sigma_v^2$$

The final step is to calculate the distribution between the Risk-Free asset and the Risky Portfolio. The distribution is calculated to give us the necessary expected return to obtain the final investment goal of the investors (10.65%), and so we have to find the portfolio in the Capital Allocation Line incorporating the carbon intensity limit that corresponds to this return. For this, the procedure is the following:

$$\sigma_p^2 = \frac{\bar{R}_p - R_f}{SR_v}$$

The percentage in Risky Assets will be $\frac{\sigma_p^2}{\sigma_v^2}$, while the percentage in the Risk-Free asset will be $1 - \frac{\sigma_p^2}{\sigma_v^2}$.

3.4.4 Portfolio Composition

The final portfolio composition is the one that fulfills all of the client's investment constraints while also ensuring an annual return equal to the investors' desired target.

To construct and chart the line that restricts carbon intensity to 20, it is imperative to possess comprehensive data on the carbon emissions of each company. The table below (table 2) presents the carbon intensity for each company. Consequently, the final portfolio composition is devised with careful consideration of this constraint while striving to minimize variance.

<i>Company Common Name</i>	<i>v_i</i>
Cellnex Telecom SA	15.87
LVMH Moet Hennessy Louis Vuitton SE	4.16
L'Oreal SA	2.39
Muenchener Rueckversicherungs Gesellschaft in Muenchen AG	1.25
Novo Nordisk A/S	0.000087
Ferrovial SE	54.80
ASML Holding NV	1.80
EDP Renewables	1.49
Publicis Groupe SA	3.99
Iberdrola SA	208.91
Industria de Diseno Textil SA	2.25
Jeronimo Martins SGPS SA	0.05
Banco Bilbao Vizcaya Argentaria, S.A.	4.03
Sartorius Aktiengesellschaft	11.18
Schneider Electric SE	6.71
Infineon Technologies AG	57.68
CRH PLC	1026.80
Enel SpA	388.99

Table 2: Carbon Intensity by Company

Source: Author

Taking into account all the constraints, including the prohibition of short-selling and carbon emission limits, the Risky Final Portfolio, which minimizes annual variance, is projected to have an annual Expected Return of 24.45% and an annual Expected Variance of 9.09%. This portfolio does not respect the Roy Safety First Criteria but since the capital is distributed between the Risky Assets portfolio and the Risk-Free Asset (36,37% in Risky Assets and 63.63% in the Risk-Free Asset) to obtain the desired expected return, this Final Portfolio (incorporating the Risk-Free Rate) lies on the left of the Roy Line and so, it complies with the limit 10% loss.

Incorporating the 15-year German Government Bond (Risk-Free Asset), the Final Portfolio is expected to yield an Annual Expected Return of 10.65% with a Variance of

3.31%. The 15-year German Government Bond, as of the date, carried a yield of 2.755%, and this data was sourced from Investing.com.

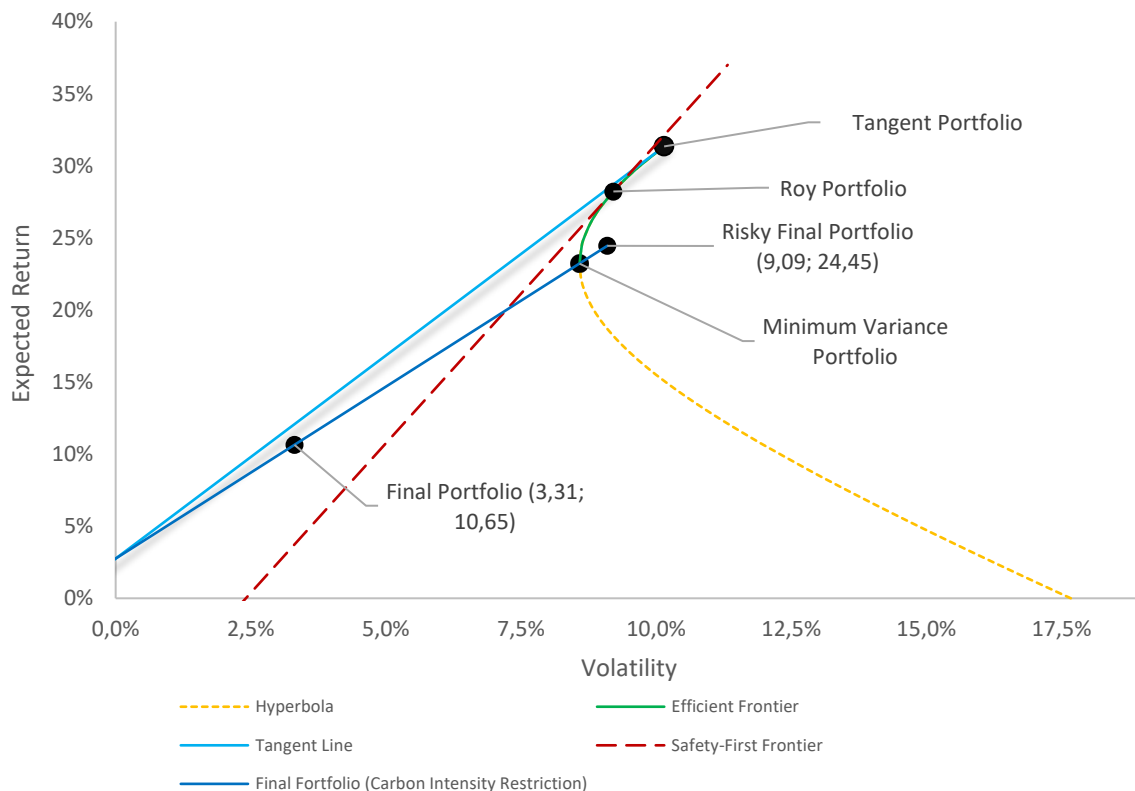


Figure 6: Volatility & Return Portfolios

Source: Author

Note: All the portfolios present in figure 6 do not allow short-selling.

For the purpose of comparison, the Tangent Portfolio, which maximizes the Sharpe Ratio, and the Minimum Variance Portfolio, which minimizes Variance, are employed to illustrate the impact of carbon intensity restrictions. It is noteworthy that both the Tangent Portfolio and the Minimum Variance Portfolio included investments in CRH PLC and Enel Spa. However, as these two companies are among the primary contributors to the increase in carbon footprint, the Final Portfolio does not incorporate these assets. Consequently, the carbon intensity has been reduced from $74.56v_i$ in the Tangent Portfolio and $103.29v_i$ in the Minimum Variance Portfolio to $20v_p$ in the Risky Final Portfolio that adheres to carbon emissions constraints.

Table 3 provides an overview of the asset distribution for each portfolio, both with and without carbon emissions constraints. This illustrates how the inclusion or exclusion of certain assets impacts the overall carbon footprint of the portfolio.

<i>Company Common Name</i>	<i>Risky Final Portfolio</i>	<i>MVP</i>	<i>Tangent Portfolio</i>	<i>Roy</i>
Cellnex Telecom SA	6.15%	5.18%	3.03%	3.85%
LVMH Moet Hennessy Louis Vuitton SE	6.21%	4.88%	7.41%	6.44%
L'Oreal SA	10.94%	8.92%	6.91%	7.68%
Muenchener Rueckversicherungs Gesellschaft in Muenchen AG	7.80%	6.11%	6.59%	6.41%
Novo Nordisk A/S	9.12%	7.55%	23.20%	17.19%
Ferrovial SE	7.30%	7.01%	3.88%	5.08%
ASML Holding NV	3.45%	2.55%	7.01%	5.30%
EDP Renewables	6.64%	5.22%	4.20%	4.59%
Publicis Groupe SA	5.05%	3.95%	2.51%	3.06%
Iberdrola SA	5.92%	11.50%	7.95%	9.31%
Industria de Diseno Textil SA	6.50%	5.16%	0.59%	2.34%
Jeronimo Martins SGPS SA	11.64%	9.60%	7.65%	8.40%
Banco Bilbao Vizcaya Argentaria, S.A.	3.03%	2.15%	1.53%	1.77%
Sartorius Aktiengesellschaft	2.73%	2.22%	3.59%	3.06%
Schneider Electric SE	6.38%	5.02%	6.18%	5.74%
Infineon Technologies AG	1.14%	1.17%	0.09%	0.50%
CRH PLC	0.00%	4.15%	3.71%	3.88%
Enel SpA	0.00%	7.64%	3.98%	5.39%
<i>Carbon Intensity</i>	20.00	103.29	74.56	85.59

Table 3: Carbon Intensity Comparison

Source: Author

3.5 Expected Performance

The Final Portfolio was constructed to achieve the clients' specified investment return objective while minimizing the risk and variance. This portfolio adheres to all the constraints outlined by the Oliveira family (Table 4).

	<i>Final Portfolio</i>
Expected Annual Return	10.65%
Expected Annual Variance	3.31%
Sharpe Ratio	2,38
% Risky Assets	36.37%
% Risk-Free Asset	63.63%

Table 4: Final Portfolio Overview

Source: Author

Finally, comparing the Risky Final Portfolio to the Benchmark chosen by João Boaventura, we can see that in figure 7 the weekly returns of both are very similar.

The benchmark used was the Euronext Climate Europe, that is also fully invested in Euros with their assets in countries from Europe. The equity selection for this index is also based on climate score.

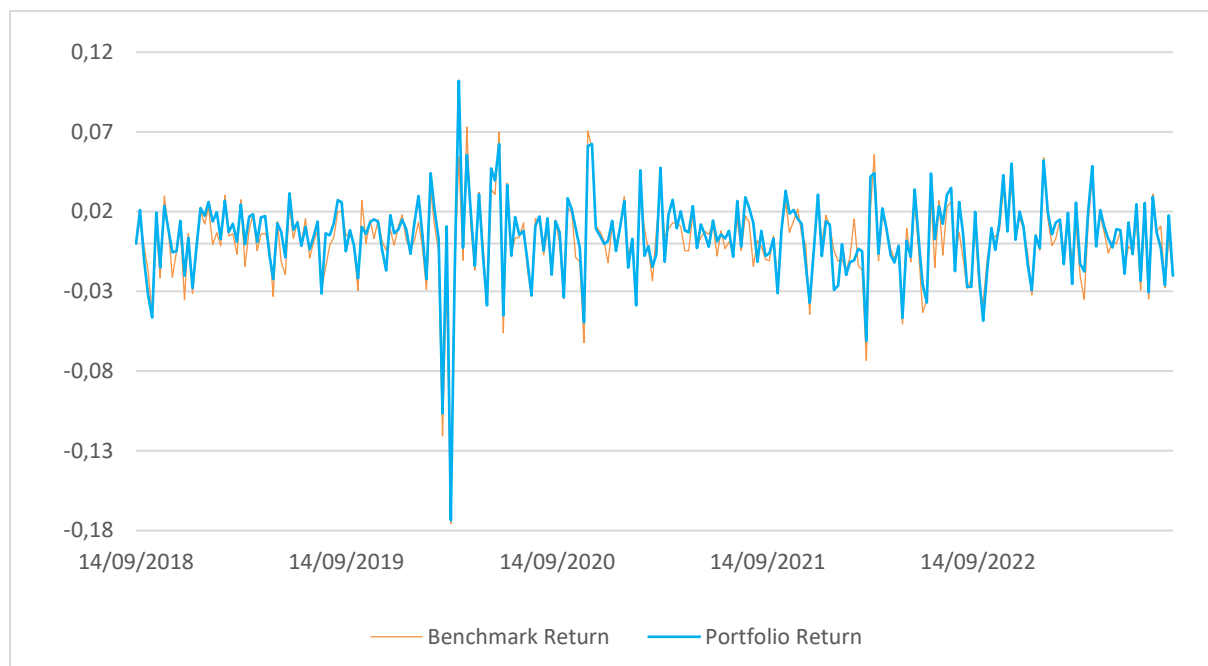


Figure 7: Benchmark vs Risky Final Portfolio Weekly Returns

Source: Author

In addition, when we analyze the historical return data, it's evident that if we had invested 1€ in the benchmark five years ago, we would have 1.22€ today. In contrast, if we had invested the same amount in the Risky Final Portfolio over the same period, we would now have 2.73€. Considering the inclusion of the Risk-Free asset, if we had invested 1€ in the Final Portfolio five years ago, we would now possess 1.72€.

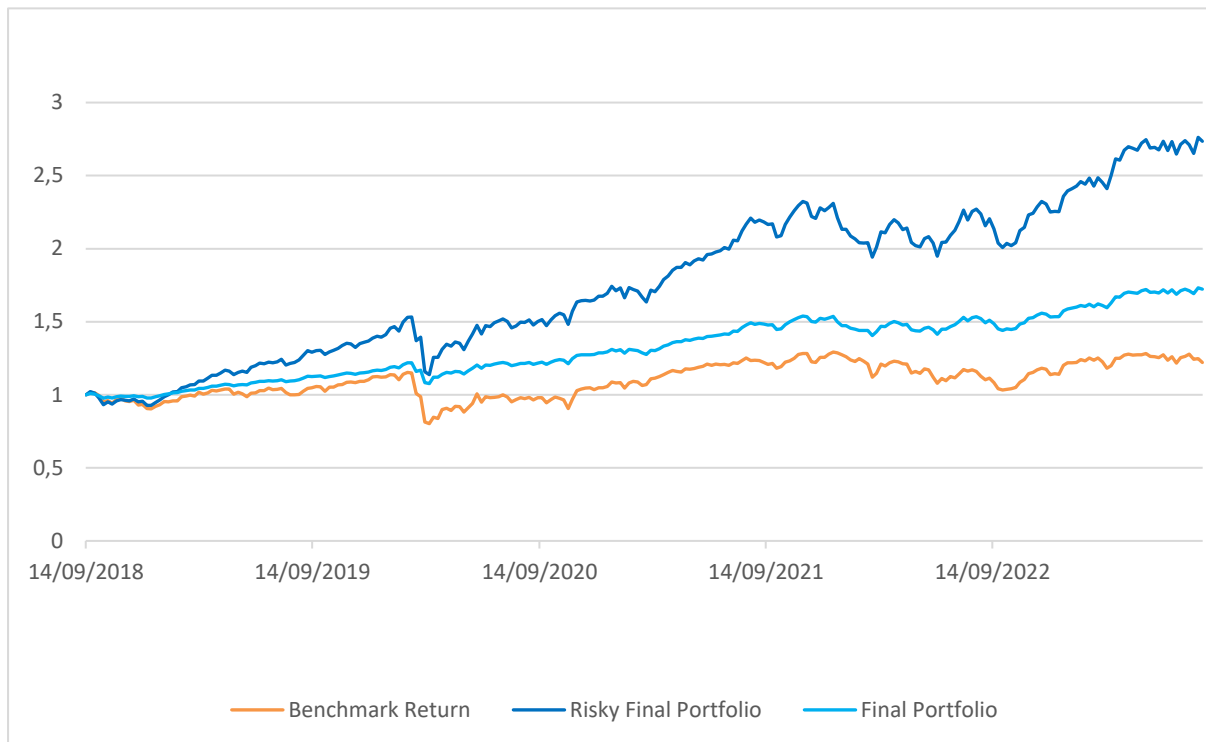


Figure 8: Benchmark vs Risky Final Portfolio vs Final Portfolio Past Weekly Returns

Source: Author

3.6 Risk Analysis

For the last chapter of this IPS, the financial advisor conducted a risk analysis so that both the clients and the portfolio manager could monitor the risk performance of the portfolio and reduce potential risks in the future. In this section, Historical VaR and Monte Carlo VaR were used.

3.6.1 Historical VaR & Monte Carlo VaR

The Historical simulation involves the use of past information based on the return in order to model potential outcomes. The Monte Carlo simulation relies on a simulator to generate a possible future outcome. For the purpose of this study, the annual returns and standard deviation of the Final Portfolio of the last 5 years were used.

	Historical Simulation	Monte Carlo Simulation
Mean	10.30%	10.31%
Stdev	5.96%	5.96%
Min	2.24%	-15.48%
Max	18.40%	37.31%
Percentile 5	3.34%	0.51%
Percentile 25	7.74%	6.28%
Percentile 75	12.45%	14.33%
Percentile 95	17.21%	20.12%

Table 5: Historical Simulation vs Monte Carlo Simulation

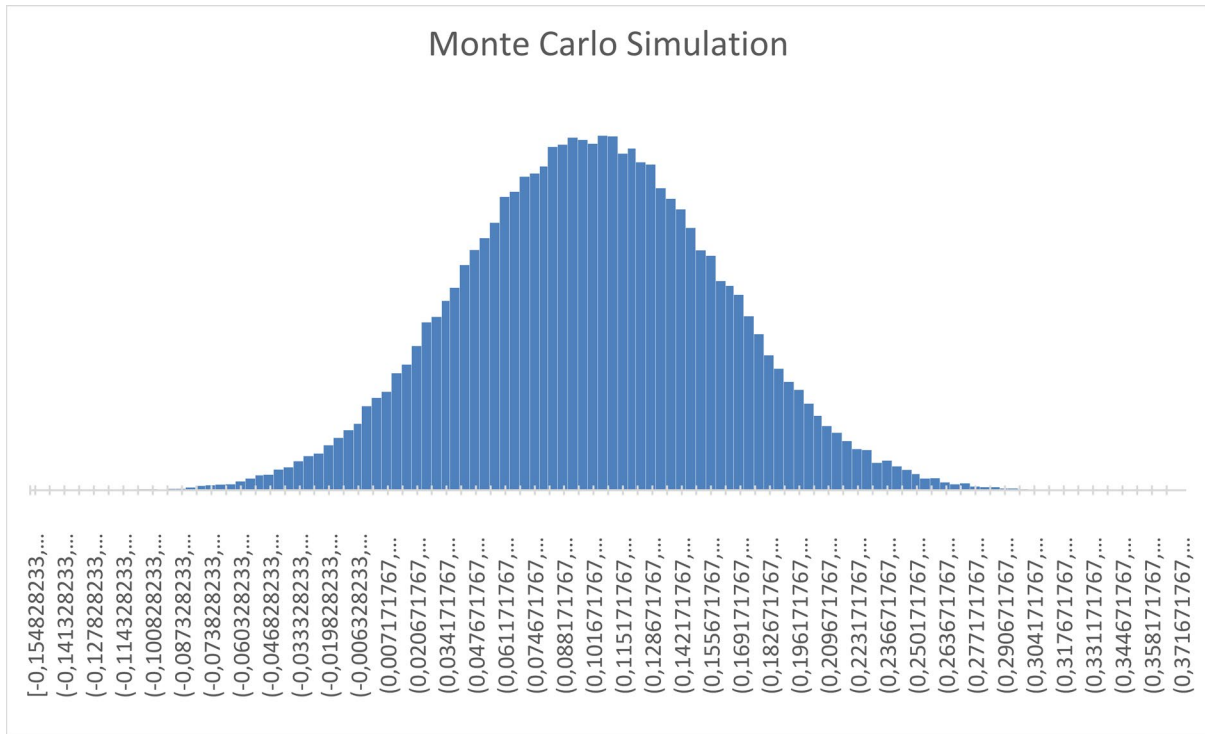
Source: Author

From table 5, we can observe that, through the 100,000 iterations in the Monte Carlo simulation, the return varies between -15.48% and 37.31% annually, with a mean return of 10.31% annually. A brief comparison of both simulations shows the same values in mean and standard deviation, confirming the efficiency of the Monte Carlo Simulation.

According to the Monte Carlo Simulation, with a total of 100,000 iterations, the percentile 5 shows that there is a 5% chance of our portfolio having a return of 0.51% or less in one year. The percentile 25 shows that there is a 25% confidence of getting a return of 6.28% or less in one year, while the percentile 75 tells us that there is a 75% confidence of getting less than a 14.33% yearly return or a 25% confidence of

getting more. Finally, percentile 95 shows that there is a 5% confidence of getting more than 20.12% in the next year.

Figure 9: Distribution of Annual Returns



Source: Author

From figure 9 we have the distribution of annual returns, 50357 observations are situated with more than the objective annual return, of 10.65%.

3.6.2 Risk Matrix

A risk matrix is essentially a toolkit that illustrates potential risks that might impact the investment plan outlined in this IPS. It combines the probability of the risk occurring with the impact it could have on the portfolio.

Table 6 below summarizes the risks that might occur in the medium term, as highlighted by BlackRock (2023) and Moody's Analytics (2023).

<i>Risks</i>	<i>Implications</i>	<i>Impact</i>
Tracking the low carbon-transition (1)	Massive reallocation of capital as energy systems are rewired. Developed markets find easier to decarbonize the sector. Inflationary pressure in energy prices.	Can impact companies with ESG focus.
Future of finance (2)	Banks gradually losing their dominance amid new regulations, technologies and competitors. Money market funds have been quicker to offer higher interest rates than banks.	Higher risk for financial institutions.
Digital disruption and AI (3)	AI-driven productivity gains could boost profit margin. Companies can lower expenses by automating processes. Semiconductors are key components for AI tools.	Good for companies in developed markets.
Fragmenting World (4)	Ukrain war and U.S.-China relations have ushered in a new era of global fragmentation. Global tensions can result on lower growth and higher inflation. Surge for investments in clean energy, technology, and defense.	Europe's economy is suffering from these conflicts.
Aging populations (5)	Many developed markets face a falling working-age population. Aging could also prove inflationary pressure. Opportunities in healthcare, real estate, leisure, and companies.	Can impact more developed countries.
Supply Chain (6)	Delays and shortages in products. Shortages can lead to a rise in costs. This can impact the clean energy transition.	Rise in inflation.

Table 6: Potential risks that can impact the portfolio.

Source: BlackRock & Moody's

Considering the risks identified in table 6, a risk matrix assessment, represented in figure 10, was designed to evaluate the probability of each event happening, ranging from Low (-) to High (+), and the impact it would have, ranging from Low to High too.

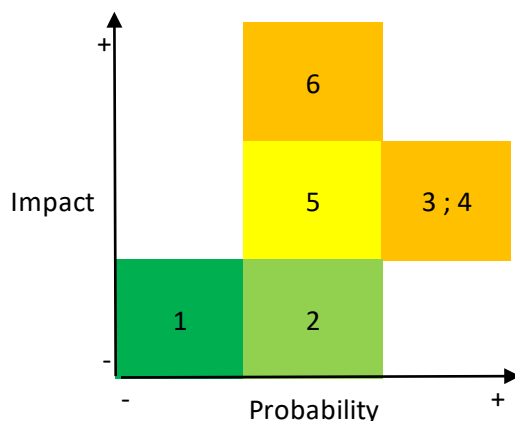


Figure 10: Risk Matrix

Source: BlackRock & Moody's

Tracking the low carbon-transition (1), has a low risk of impacting the portfolio. The Future of finance (2) risk has a medium probability of happening but has a low impact on the portfolio. Digital disruption and AI (3) and Fragmenting World (4) are seen as risks that have a high probability of happening but a medium impact on the investor's portfolio. The risk number 5, Aging Populations, has a medium probability and medium impact. Finally, the sixth risk, Supply Chain (6), represents a risk with high impact on the portfolio's securities, with a medium probability.

Finally, as a portfolio manager, mitigating these risks involves implementing a comprehensive risk management strategy. In each monthly report, the risk performance of each of the six risk categories will be assessed and during the semi-annual asset allocation review, modifications will be implemented accordingly based on the risk assessment. This strategy will be regularly communicated to the clients for transparency and informed decision-making.

Appendices

Appendice 1. Client's Profile

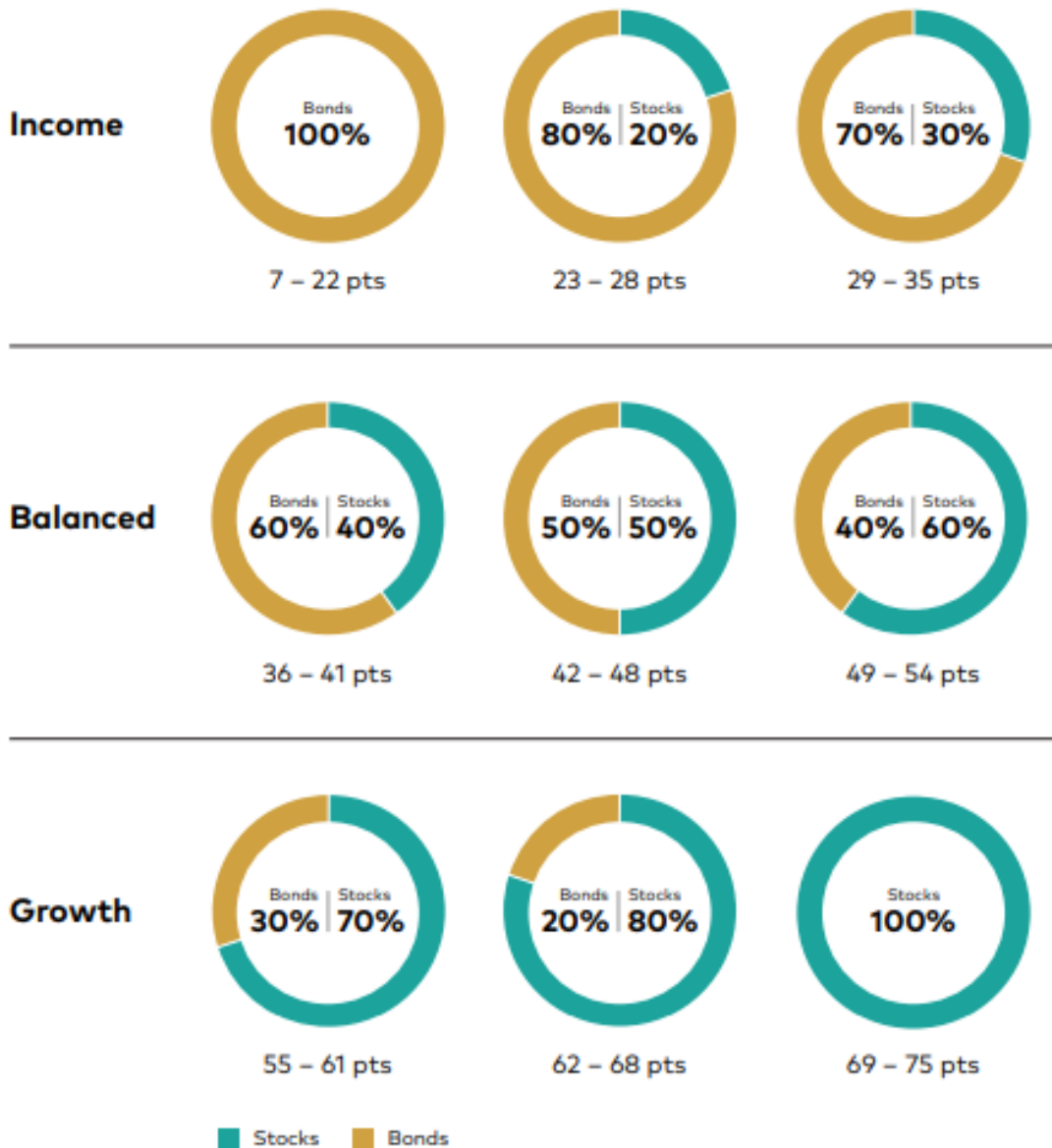
Family	Manuel Oliveira - Husband Maria Oliveira - Wife João Oliveira - Son
Age	Manuel Oliveira - 35 Maria Oliveira - 34 João Oliveira - 3
Occupation/Annual Income	Manuel Oliveira - Physiotherapist / 40 000€ Maria Oliveira - Medical Doctor / 48 000€
Education	Manuel Oliveira - Master's in Physiotherapy Maria Oliveira - Master's medicine with specialization in family medicine
Additional Information	First time investing in shares. Small knowledge about financial markets.
Constraints	No short-selling Only stocks investment No tobacco, weapons, alcohol or fossil fuels industry companies High ESG rating Restriction on carbon emission Investing only in Euros Investing only in European Companies Only Large or Mega Cap Companies Maximum annual loss of 10% Not investing in Real Estate
Risk Profile	Conservative
Amount to Invest	70000
Investment Objective	180000€ (249480.12€ assuming 2,2% inflation rate)
Investment Horizon	15 years
Expected Return Objective	10,65%

Appendice 2. Profiling Questionnaire

<i>Question</i>	<i>Response</i>	<i>Points</i>
1. I plan to begin taking money from my investments in ...	F. More than 15 years	17
2. As I withdraw money from these investments, I plan to spend it over a period of ...	A. 2 years or less	0
3. When making a long-term investment, I plan to keep my money invested for ...	E. More than 8 years	7
4. From September 2008 through November 2008, stocks lost over 31%. If I owned a stock investment that lost about 31% in three months, I would ...	A. Sell all of the remaining investment	1
5. Generally, I prefer an investment with little or no ups or downs in value, and I am willing to accept the lower returns these investments may generate.	E. I strongly agree	0
6. When the market goes down, I tend to sell some of my riskier investments and put money in safer investments.	D. I agree	2
7. Based only on a brief conversation with a friend, coworker, or relative, I would invest in a mutual fund.	E. I strongly agree	1
8. From September 2008 through October 2008, bonds lost nearly 4%. If I owned a bond investment that lost almost 4% in two months, I would ...	A. Sell all of the remaining investment	1
9. The chart below shows the highest one-year loss and the highest one-year gain on three hypothetical investments of \$10,000.* Given the potential gain or loss in any one year, I would invest my money in ...	A. Investment A (gain \$593; loss \$164)	1
10. My current and future income sources (such as salary, Social Security, pension) are ...	D. Stable	4
11. When it comes to investing in stock or bond mutual funds (or individual stocks or bonds), I would describe myself as ...	A. Very inexperienced	1
Total		35

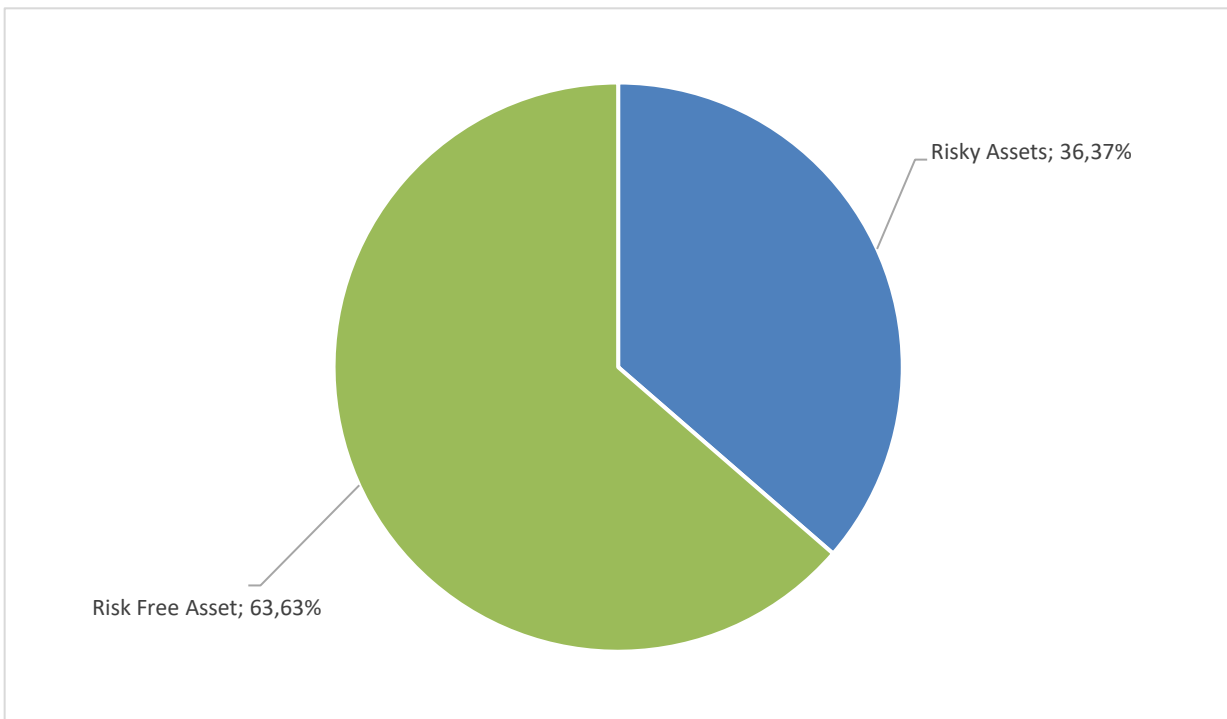
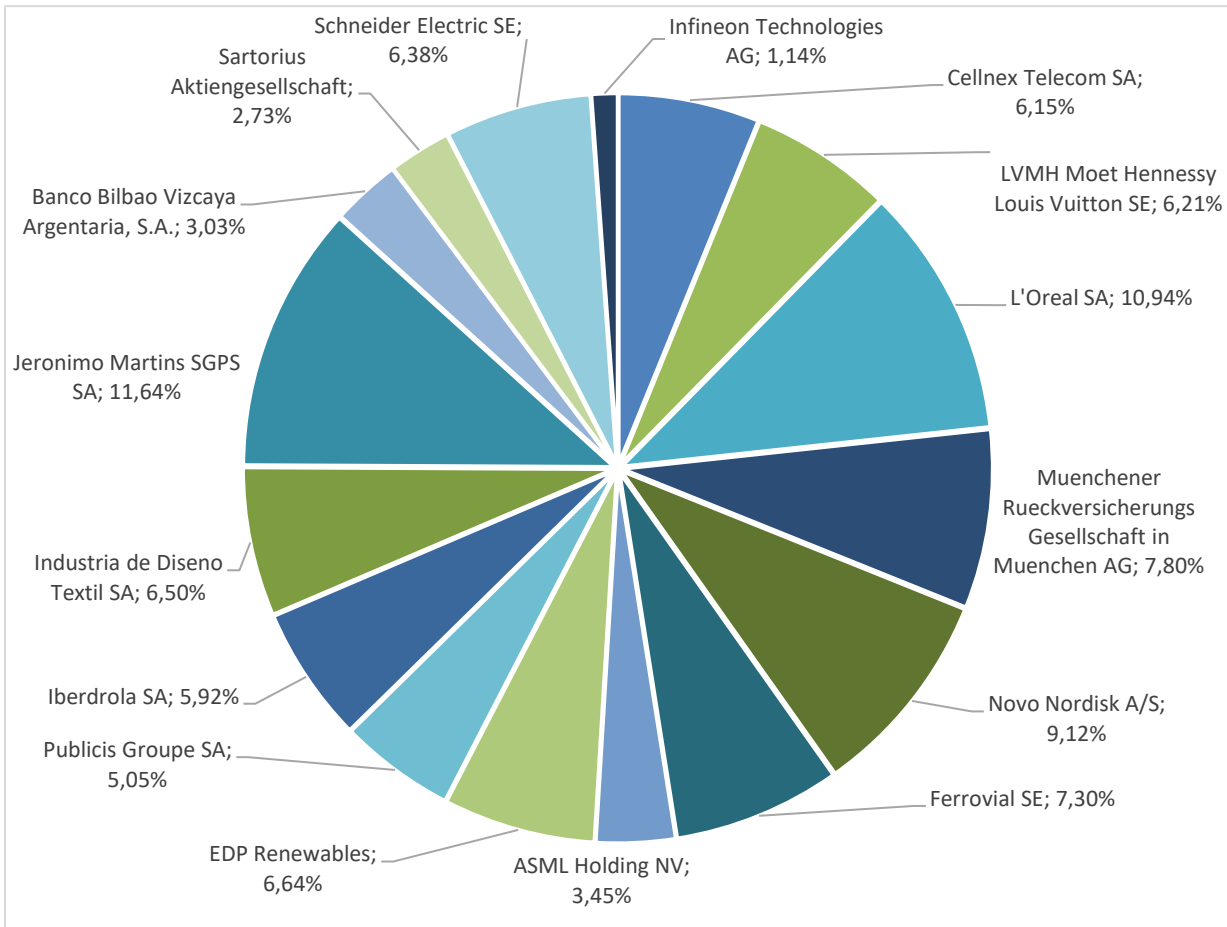
Find your suggested investment mix

A suggested investment mix is just an example of a mix that someone with your risk tolerance and investment time horizon may consider. If you do not feel that the suggested mix is right for you, you may decide to use a more conservative or a more aggressive asset mix. A more conservative mix would have a higher percentage of bonds than your suggested mix. A more aggressive mix would have a higher percentage of stocks than your suggested mix.



Source: Vanguard Investment Questionnaire

Appendice 3. Portfolio Composition



Appendice 4. Securities Description

<i>Company</i>	<i>Description</i>
Cellnex Telecom SA	Cellnex Telecom, S.A. operates infrastructure for wireless telecommunication in Europe. It operates through three segments: Telecom Infrastructure Services, Broadcasting Networks, and Network Services and Others.
LVMH Moët Hennessy Louis Vuitton SE	LVMH Moët Hennessy - Louis Vuitton, Société Européenne operates as a luxury goods company worldwide.
L'Oreal SA	L'Oréal S.A., through its subsidiaries, manufactures and sells cosmetic products for women and men worldwide. The company operates through four divisions: Consumer Products, L'Oréal Luxe, Professional Products, and Active Cosmetics.
Muenchener Rueckversicherungs Gesellschaft in Muenchen AG	Münchener Rückversicherungs-Gesellschaft Aktiengesellschaft in München engages in the insurance and reinsurance businesses worldwide.
Novo Nordisk A/S	Novo Nordisk A/S, a healthcare company, engages in the research, development, manufacture, and marketing of pharmaceutical products worldwide. It operates in two segments, Diabetes and Obesity care, and Rare Disease.
Ferrovial SE	Ferrovial SE, together with its subsidiaries, develops transport infrastructure, mobility solutions, civil works, and buildings projects in Spain and internationally.
ASML Holding NV	ASML Holding N.V. develops, produces, markets, sells, and services advanced semiconductor equipment systems consisting of lithography, metrology, and inspection systems for memory and logic chipmakers.
EDP Renewables	DP Renováveis, S.A., a renewable energy company, plans, constructs, operates, and maintains electric power generation plants.
Publicis Groupe SA	Publicis Groupe S.A. provides marketing, communications, and digital business transformation services worldwide.
Iberdrola SA	Iberdrola, S.A. engages in the generation, transmission, distribution, and supply of electricity worldwide.
Industria de Diseno Textil SA	Industria de Diseño Textil, S.A. engages in the retail and online distribution of clothing, footwear, accessories, and household textile products through various retail concepts.
Jeronimo Martins SGPS SA	Jerónimo Martins, SGPS, S.A. operates in the food distribution and specialized retail sectors in Portugal, Poland, and Colombia.
Banco Bilbao Vizcaya Argentaria, S.A.	Banco Bilbao Vizcaya Argentaria, S.A., together with its subsidiaries, provides retail banking, wholesale banking, and asset management services.
Sartorius Aktiengesellschaft	Sartorius Aktiengesellschaft provides bioprocess solutions and lab products and services worldwide.
Schneider Electric SE	Schneider Electric S.E. engages in the energy management and industrial automation business worldwide.
Infineon Technologies AG	Infineon Technologies AG designs, develops, manufactures, and markets semiconductors and related system solutions worldwide.
CRH PLC	CRH plc, through its subsidiaries, manufactures and distributes building materials in Ireland and internationally.
Enel SpA	Enel SpA operates as an integrated electricity and gas operator worldwide.

Source: YahooFinance!

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