



Lisbon School
of Economics
& Management
Universidade de Lisboa

MASTER OF SCIENCE IN FINANCE

MASTERS FINAL WORK PROJECT

INVESTMENT POLICY STATEMENT:

ADAM MILLER

ZOFIA TERESA ZAGÓRSKA

JUNE 2026



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PROFESSOR JOÃO MARIA JORGE

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Abstract

This Investment Policy Statement is developed for Mr. Adam Miller, a 25-year-old Polish professional tennis player seeking to allocate PLN 4,000,000 of accumulated savings over a 10-year horizon. The client's objective is to finance planned entrepreneurial activity and preserve capital for lifestyle support after retirement from professional sport. This requires a pre-tax terminal portfolio value of PLN 8,180,355, equivalent to a gross nominal return requirement of 7.42% per year.

The client's risk profile is classified as adventurous, reflecting a high need and ability to take risk, supported by moderate-to-high behavioral loss tolerance. The main constraints include no planned withdrawals during the accumulation phase, tax awareness, preference for transparent UCITS ETF instruments, no leverage or short selling, ethical exclusions, and limits on single-security concentration.

The investment policy follows a long-term, predominantly passive, and globally diversified approach. A mild factor tilt toward value, quality, and low volatility characteristics is incorporated into the ETF selection process to support more balanced equity exposure. The recommended Strategic Asset Allocation consists of 70% equities, 20% fixed income, and 10% gold, combining return-seeking exposure with stabilizing and diversifying components.

Portfolio construction is supported by ETF screening, Mean-Variance optimization, and efficient frontier analysis. Risk analysis was conducted using three different Value-at-Risk methods, Monte Carlo simulation, and a qualitative risk matrix. The optimized portfolio generates an expected annual return of 7.78% and annualized volatility of 10.05%.

Overall, the IPS provides a disciplined framework for pursuing the client's terminal wealth objective through structured portfolio allocation, transparent implementation, and regular monitoring.

JEL classification: C6; G11

Keywords: Asset Management; Portfolio Theory; IPS; Individual Investor; Risk Profiling; ETF; Mean-Variance Optimization; Strategic Asset Allocation; Risk Management

Resumo

Esta Declaração de Política de Investimento é desenvolvida para o Sr. Adam Miller, um jogador profissional polaco de ténis de 25 anos que pretende alocar PLN 4.000.000 de poupanças acumuladas ao longo de um horizonte de 10 anos. O objetivo do cliente é financiar atividade empreendedora planeada e preservar capital para apoio ao estilo de vida após a retirada do desporto profissional. Isto requer um valor terminal da carteira antes de impostos de PLN 8.180.355, equivalente a um requisito de rendibilidade nominal bruta de 7,42% por ano.

O perfil de risco do cliente é classificado como aventureiro, refletindo uma elevada necessidade e capacidade de assumir risco, apoiadas por uma tolerância comportamental a perdas moderada a elevada. As principais restrições incluem a ausência de levantamentos planeados durante a fase de acumulação, sensibilidade fiscal, preferência por instrumentos UCITS ETF transparentes, ausência de alavancagem ou venda a descoberto, exclusões éticas e limites à concentração num único título.

A política de investimento segue uma abordagem de longo prazo, predominantemente passiva e globalmente diversificada. Uma ligeira inclinação fatorial para características de valor, qualidade e baixa volatilidade é incorporada no processo de seleção de ETFs, de modo a apoiar uma exposição acionista mais equilibrada. A Alocação Estratégica de Ativos recomendada consiste em 70% ações, 20% rendimento fixo e 10% ouro, combinando exposição orientada para a rendibilidade com componentes estabilizadoras e diversificadoras.

A construção da carteira é apoiada pela filtragem de ETFs, otimização média-variância e análise da fronteira eficiente. A análise de risco foi conduzida utilizando três métodos diferentes de Value-at-Risk, simulação de Monte Carlo e uma matriz qualitativa de risco. A carteira otimizada gera uma rendibilidade anual esperada de 7,78% e uma volatilidade anualizada de 10,05%.

No geral, a IPS fornece um enquadramento disciplinado para perseguir o objetivo de riqueza terminal do cliente através de uma alocação estruturada da carteira, implementação transparente e monitorização regular.

Classificação JEL: C6; G11

Palavras-chave: Gestão de Ativos; Teoria da Carteira; IPS; Investidor Individual; Perfil de Risco; ETF; Otimização Média-Variância; Alocação Estratégica de Ativos; Gestão de Risco

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The Advisory Process & IPS Proposal

This document presents the final Investment Policy Statement prepared for Mr. Adam Miller, a 25-year-old Polish professional tennis player. The mandate was to design a personalized long-term investment strategy for PLN 4,000,000 of accumulated savings, with the purpose of supporting the client's transition from professional sport to post-career entrepreneurship while preserving financial flexibility during the early post-career period.

The advisory challenge is shaped by the specific nature of the client's profession. Professional sport can generate substantial income, but that income is uncertain, performance-dependent, and limited by the duration of an athletic career. For this reason, the investment strategy must do more than seek attractive returns. It must create a disciplined framework for transforming current wealth into capital that can support future objectives.

The advisory process followed a structured five-phase approach.

a. Discovery

The first stage consisted of gathering information about the client's financial position, career expectations, objectives, constraints, and attitude toward risk. This phase identified two main goals: funding the establishment of a tennis academy and sportswear brand and maintaining an additional financial reserve to support the client's desired lifestyle. The discovery stage also confirmed that the portfolio has a 10-year horizon and no expected withdrawals during the accumulation phase.

b. Analysis

The second stage converted the client's goals into measurable investment requirements. The target amount of PLN 5,770,000 was treated as a real terminal objective and adjusted for inflation and Polish capital gains taxation. This resulted in a required pre-tax terminal value of PLN 8,180,355 by 2036, equivalent to a required gross nominal return of 7.42% per year.

The risk profiling process indicated a high need for risk, high ability to take risk, and moderate-to-high behavioral loss tolerance. The client's overall profile is therefore classified as adventurous, although the strategy still required clear limits, diversification, and review discipline.

c. Strategy Formulation

The third stage focused on translating the required return and risk profile into an appropriate investment strategy. A purely defensive allocation would not provide sufficient expected return, while an undiversified equity portfolio would expose the client to excessive drawdown risk. The proposed solution is therefore a goals-based multi-asset strategy built around long-term Strategic Asset Allocation, broad diversification, and passive implementation. The strategy targets a required annual return of 7.42%, while maintaining risk exposures within defined policy ranges.

d. Implementation and Documentation

The IPS serves as the formal record of the agreed investment policy. It defines the client's objectives, constraints, governance rules, investment philosophy, Strategic Asset Allocation, security selection process, portfolio construction methodology, risk controls, and monitoring procedures.

Implementation is based on passive UCITS ETFs, selected through a structured screening process. The criteria focus on liquidity, cost efficiency, fund size, tracking quality, replication method, and consistency with the intended asset-class exposure. Instruments involving leverage, inverse exposure, short selling, or unnecessary complexity are excluded.

e. Monitoring

The final phase establishes the process for supervising the portfolio after implementation. Allocation weights will be monitored monthly against the approved policy ranges, while portfolio performance will be reviewed quarterly against the required return path and the composite benchmark. A formal IPS review will be conducted annually, with additional reviews triggered by material changes in the client's personal situation, risk capacity, tax position, or market environment.

The core output of the advisory process is a Strategic Asset Allocation of 70% equities, 20% fixed income, and 10% gold. This allocation is designed to provide the return potential required to pursue the client's terminal wealth objective while reducing excessive dependence on equity market performance alone. Equities represent the main engine of long-term growth, fixed income provides stability and diversification, and gold introduces an additional source of

resilience in periods of inflation pressure, geopolitical stress, or when equities and bonds become more positively correlated.

The final portfolio is constructed within the limits defined by the IPS. These include full investment, no short selling, allocation ranges around the strategic weights, and a maximum allocation of 10% to any single security. The optimized portfolio produces an expected annual return of approximately 7.78% and annualized volatility of approximately 10.05%. Since the expected return is above the required gross nominal return of 7.42%, the proposed allocation is consistent with the client's financial objective under the assumptions used in the analysis. At the same time, the risk analysis confirms that the strategy remains exposed to downside risk, which justifies the use of VaR, CVaR, Monte Carlo simulation, and a qualitative risk matrix as complementary monitoring tools.

The proposed IPS is recommended for implementation as it provides a disciplined basis for managing Mr. Miller's capital throughout the 10-year investment horizon. Rather than treating the portfolio as a collection of individual investments, the policy frames each decision in relation to the client's profile. The following sections present the detailed governance framework, risk profiling, investment design, portfolio construction, monitoring process, and risk analysis that support this recommendation.

1 Scope and Purpose

This Investment Policy Statement (IPS) outlines a structured, client-focused framework for managing the investment portfolio of Mr. Adam Miller, a 25-year-old professional tennis player from Poland. It defines the objectives, constraints, and guiding principles that will govern capital allocation decisions over a 10-year investment period. In practical terms, the IPS serves as a strategic reference document: it provides a coherent basis for portfolio design and ongoing decision-making, aligns expectations between the client and the advisor, especially during periods of market stress, and establishes clear standards for monitoring and evaluating performance against appropriate benchmarks. It creates a disciplined framework for future portfolio reviews and rebalancing decisions, ensuring that the strategy can be assessed consistently as the client's circumstances and market conditions evolve.

The IPS is intended to support the client's career transition by managing PLN 4,000,000 from his accumulated savings toward clearly defined post-career goals, including funding planned entrepreneurial ventures and preserving financial flexibility. The primary aim is to support the client's long-term financial objectives while maintaining a level of risk compatible with the client's tolerance and capacity for loss. This balance is particularly important given the characteristics of a professional sports career, where earning potential may be high but often irregular, and where career duration and injury risk create uncertainty around future cash flows.

The proposed strategy is designed to construct a well-diversified, multi-asset portfolio intended to deliver satisfactory returns while ensuring an adequate margin of safety.

This IPS should be understood as the formal outcome of an advisory process conducted with Mr. Miller: it consolidates the insights gathered about the client's financial situation, priorities, and values into a disciplined, personalized investment approach. In line with the ethical expectations set out in the CFA Institute's Code and Standards (effective 2024), the document is grounded in a know-your-client and suitability assessment and embeds a client-first duty to act in the investor's best interest.

2 Governance

The governance section of this IPS defines the operating structure through which the portfolio is managed, including decision authority, responsibilities, review discipline, and reporting standards.

The financial advisor, Ms. Zofia Zagórska, is responsible for developing and maintaining the IPS, translating the client's objectives and constraints into an implementable investment strategy, determining the strategic asset allocation based on the client's profile and capital market expectations, executing portfolio transactions within the agreed limits, and monitoring both performance and adherence to policy.

The client, Mr. Adam Miller, retains final authority over the investment arrangement and therefore approves the IPS prior to implementation, as well as any material revisions to objectives, constraints, or strategy. The client's contribution is to provide accurate and complete information relevant to his priorities and preferences and, when relevant, to notify the advisor of changes that may affect the investment plan.

The IPS is subject to a formal annual review, and it will also be revisited when a significant change in circumstances could reasonably affect objectives, liquidity needs, time horizon, or risk capacity.

When specialized expertise is required, most commonly tax or legal input, external advisors may be consulted to support sound implementation, while portfolio accountability remains with the advisor and decision approval remains with the client.

Quarterly reporting will provide a clear and comparable record of outcomes and positioning, including portfolio valuation, performance versus agreed benchmarks, allocation relative to strategic targets, and concise commentary on material drivers, risks, and any deviations from policy, along with recommended corrective actions.

3 Risk Profiling

The purpose of this chapter is to establish the client's Investment Risk Profile (IRP), which is an essential step in ensuring that the proposed portfolio is suitable for achieving investment goals. This analysis was conducted by the financial advisor on the basis of the CFA Institute's Investment Risk Profiling guide (2020). It consists of separately assessing three main factors:

- (i) need for risk
- (ii) ability to take risk
- (iii) behavioral loss tolerance

The client's need for risk is discussed in Sections 3.1 and 3.2, while the ability to take risk and behavioral loss tolerance are discussed in Section 3.3.

3.1 Investment Objectives

The first factor within an IRP, the investor's need for risk, focuses on identifying the investor's goals and determining the return required to grow current assets so they can finance those future objectives.

Mr. Miller is a 25-year-old professional tennis player currently residing in Warsaw. He reports excellent health and expects to continue his career for the next ten years. Following retirement from competitive sport, he plans to establish a tennis academy for young talents in Warsaw and launch his own sportswear brand. Accordingly, the client's investment objectives reflect a transition from athletic earnings to entrepreneurial activity and long-term financial independence. The client's primary investment objective is to accumulate sufficient capital to fund the establishment of these future business ventures. The secondary investment objective is to set aside additional capital to support the client's desired standard of living following the transition out of professional tennis, particularly during the initial period when cash flows from the new ventures may be uncertain.

The investable capital to be managed under this IPS amounts to PLN 4,000,000. Based on preliminary market analysis and an indicative business plan prepared with professional advisors, Mr. Miller estimates that establishing the tennis academy and sportswear brand will require approximately PLN 4,670,000 in total. In addition, he intends to allocate

PLN 1,100,000 towards post-retirement lifestyle support. Taken together, these objectives imply a target portfolio value of PLN 5,770,000 by 2036, in net real terms.

3.2 Return and risk requirements

To translate the capital requirements set out in Section 3.1 into an explicit return and risk profile, the target of PLN 5,770,000 is treated as a real (today's money) amount to be available at the end of the 10-year horizon, with no planned withdrawals during the accumulation phase, allowing for uninterrupted compounding of returns.

Based on the National Bank of Poland's Inflation Report (November 2025), which indicates that CPI inflation is expected to ease and move back towards the NBP's target range over the forecast period, this IPS adopts 2.5% per annum as a conservative long-run inflation assumption for Poland. This choice is supported by the fact that the investor's post-career spending is expected to take place primarily in his home country. Accordingly, the nominal net amount required by the end of the investment period is approximately PLN 7,386,088.

The client is assumed to spend more than 183 days in Poland each year and is therefore treated as a Polish tax resident. Capital gains are subject to a flat 19% tax rate. With the initial PLN 4,000,000 taken as the cost basis, the required pre-tax terminal value amounts to PLN 8,180,355. This corresponds to a required gross nominal compound return of 7.42% per annum over ten years.

From a risk perspective, this return requirement points to a growth-oriented portfolio and acceptance of meaningful interim volatility. Given that the objectives are tied to a fixed date, the critical risk is not short-term fluctuation in isolation but drawdown risk (a large peak-to-trough decline), especially in the later phase of the investment horizon, when there is less time to recover losses. A material late-horizon drawdown could reduce the probability of fully funding both the business ventures and the post-retirement lifestyle reserve.

3.3 Risk Tolerance

An investor's ability to take risk can be divided into three key elements:

- (i) goal time horizon
- (ii) need for liquidity
- (iii) risk capacity

The client's investment horizon is defined as 10 years, which is classified as long-term and signals greater capacity to withstand and recover from losses resulting from market volatility. An absence of expected distributions during the capital accumulation phase is another factor suggesting a high ability to take financial risk.

The client has already established a relatively strong financial position for his age. One of the defining characteristics of his profession, however, is the variability of earnings, as they consist largely of tournament prizes. These earnings may be very high, but irregular, while expenses related to coaching, travelling, and medical support are also significant. In addition to the PLN 4,000,000 assigned to the investment portfolio, Mr. Miller owns two debt-free rental properties. His visibility as an athlete has also resulted in several recurring marketing contracts, which provide an additional source of income less directly tied to sporting performance. These additional income streams and non-portfolio assets provide a degree of stability despite the variability of his sporting income. As he has no dependents and no material financial obligations beyond normal living and career-related expenses, an unexpected loss resulting from an emergency or a market decline should therefore not compromise his desired standard of living. The client's financial situation described above indicates high risk capacity.

In summary, under the CFA Investment Risk Profiling guide, a time horizon of at least 10 years, the absence of expected liquidity needs exceeding 5% of the portfolio value, and the availability of sufficient outside income and assets to maintain the desired standard of living in the event of an emergency classify the client as one with high ability to take risk. Ability-related factors are recognized to be most likely to change throughout the investment timeline and will therefore be revisited if the client's circumstances change significantly and as the goal nears completion.

To assess the final IRP factor, behavioural loss tolerance, Mr. Miller answered a detailed questionnaire, prepared by the advisor for the purpose of this IPS. This questionnaire recognizes six elements of behavioural loss tolerance mentioned in the CFA guidelines: risk tolerance, risk preference, risk composure, risk perception, financial knowledge, and investing experience.

The questionnaire is largely based on the Prospect Theory (Kahneman & Tversky, 1979), which describes decision-making process under conditions of risk. In their paper, the authors highlight that individuals evaluate gains and losses relative to a reference point, exhibit greater sensitivity to negative than to positive changes, and that their preferences strongly depend on

the formulation of problems, leading to decision patterns that deviate from rational choice models. To extend this idea, in *The Survey of Behavioral Finance* (Barberis & Thaler, 2003), the authors examine these deviations observed in financial markets and discuss their implications for individual trading behavior. The conclusions drawn from these papers informed both the construction of the questionnaire and the interview conducted with the client. The questionnaire, together with the client's responses, is included in the Appendix Table A2. Overall, careful analysis of the results points to a moderate-to-high behavioural loss tolerance profile. The average section scores for risk tolerance, risk preference, risk composure, and risk perception are 4, 4, 4, and 3, respectively, on a 1-5 scale. The supporting sections, financial knowledge and investment experience, are interpreted qualitatively, and are considered when interpreting the overall profile.

Mr. Miller is generally comfortable accepting interim volatility, shows a strong preference for return-seeking strategies, and is likely to remain composed during periods of market stress, adhering to a previously agreed plan. He is open to making portfolio adjustments, but only after careful consideration.

A slightly lower score in the risk perception section, which captures how the investor judges the level of risk associated with the broader economic environment, reflects the fact that the client's career and financial situation at a given point in time influence the way he perceives risk, and that he perceives risk more strongly as the target date approaches.

The client answered four out of five financial literacy questions correctly. The questions were drawn from the Lusardi and Mitchell financial literacy framework, as applied in the U.S. National Financial Capability Study and reported by Lusardi (2011). This result suggests that the client has a basic understanding of core financial concepts relevant to investment decision making, including interest rates, inflation, risk diversification, bond prices, and mortgage-related calculations. The section addressing prior investment activity indicates some familiarity with simple financial market products and an ability to remain invested during periods of volatility.

Taken together, this assessment supports the conclusion that the client's overall risk profile may be classified as adventurous (Royal London Risk Profiler terminology), as summarized in Table 1 below. Accordingly, the recommended portfolio may assume substantial exposure to higher-risk, higher-return assets, while still requiring clear governance, structured review procedures, and protection against emotionally driven reactions to temporary market stress.

Risk should be assumed in a disciplined manner and remain aligned with the client's long-term objectives.

Table 1: Risk Profiling Summary

Need for risk	Ability to take risk	Behavioural loss tolerance	Risk profile
High	High	Moderate-to-High	Adventurous

3.4 Constraints

The portfolio is subject to several constraints that define the practical limits of the investment strategy. The primary constraint is the time horizon, which is set at 10 years. This horizon is considered long-term and therefore allows the portfolio to assume meaningful exposure to return-seeking assets.

No withdrawals are anticipated during the accumulation phase, as the client maintains a separate liquidity reserve for short-term personal and professional needs. As a result, the portfolio is not currently expected to face material liquidity requirements.

A further constraint relates to the tax environment. For the purposes of this IPS, the client is assumed to remain a Polish tax resident throughout the investment period. Capital gains and dividends are currently subject to a flat 19% tax rate. Portfolio decisions should therefore be evaluated with regard to their after-tax outcomes. This favours an implementation approach that is selective about instruments that generate frequent taxable distributions and avoids unnecessary trading activity that could trigger avoidable tax liabilities.

From a legal and regulatory perspective, the portfolio will comply with all applicable laws and market regulations. No additional client-specific legal constraints are identified at this stage.

Mr. Miller has not expressed any particular ESG-related preferences. Therefore, the portfolio is not subject to a positive-screening approach, a best-in-class selection framework, or dedicated thematic allocations based on environmental, social, or governance considerations. However, a limited form of negative screening is applied, reflecting the client's ethical values. The portfolio should therefore exclude direct exposure to issuers whose principal business activities relate to tobacco, gambling, and weapons manufacturing.

Given the client's relatively limited practical investment experience, the portfolio should be implemented through instruments that are transparent in structure, straightforward to value, and easy to monitor over time. Complex, highly opaque alternative vehicles, and instruments whose risk profile depends on embedded leverage or non-linear payoff features should be avoided. This restriction is justified by the client's need for a portfolio whose sources of risk and return remain clearly understandable. As part of the portfolio's implementation constraints, short selling is not allowed.

Diversification should also constitute a central implementation principle. No single security should represent more than 10% of total portfolio value at the time of purchase. The strategy should avoid excessive concentration in any single sector or geography.

Additional concentration constraints arise from the client's broader economic profile. Since he already owns two rental properties and intends to commit future capital to ventures linked to sport and consumer branding, the financial portfolio should not become overly exposed to real estate or to sectors closely related to his existing and expected future sources of income. In this context, the role of the portfolio is not only to generate returns, but also to diversify exposures that are already present elsewhere in the client's personal balance sheet.

Finally, any material breach of these constraints, whether caused by market developments or by changes in the client's personal circumstances, should trigger a formal review by the advisor. Where the breach is significant and cannot be justified by market conditions, tax considerations, or transaction-cost concerns, the portfolio should be rebalanced within a reasonable period so that the allocation remains consistent with the IPS and the client's long-term goals.

4 Investment Design

4.1 Investment Philosophy

According to Damodaran (2026), an investment philosophy may be understood as a coherent set of beliefs about how investors behave, how markets function, and how they can sometimes depart from efficiency. In Damodaran's framework, such a philosophy begins with a view of investor behaviour, develops into a broader view of how markets work or fail, and is then translated into concrete investment strategies consistent with those beliefs. Its importance lies in the fact that, without a clear philosophy, investors are more likely to shift from one strategy to another in response to short-term performance, incur unnecessary transaction costs and taxes, and adopt approaches that are not well matched to their objectives, risk tolerance, or personal circumstances. An investment philosophy therefore provides a stable foundation for portfolio design and helps ensure consistency between the investor's beliefs, constraints, and chosen strategy.

This IPS is built around a long-term, strategically allocated, and predominantly passive investment strategy. The starting point is the view that capital markets are broadly efficient, such that persistent outperformance through tactical market timing or discretionary security selection is difficult to achieve consistently, especially after fees and transaction costs. This perspective is supported by theoretical and empirical research conducted by Fama (1970), which presents extensive evidence in support of the efficient market model.

In line with Markowitz (1952), the portfolio is designed using a top-down approach, with strategic asset allocation treated as the primary driver of long-run outcomes and diversification treated as the central mechanism for reducing uncompensated risk at the level of the total portfolio rather than individual securities. The aim is to hold securities whose returns are not too strongly positively related.

The investment philosophy is implemented exclusively through exchange-traded funds, with UCITS-compliant structures preferred when applicable. This choice is justified by several structural characteristics of ETFs that are well aligned with the client's profile and preferences. ETFs can provide broad diversification through a single listed vehicle, intraday tradability, transparency of holdings, often lower total expense ratios, and, in many cases, tax efficiency. Inverse or leveraged ETFs typically have unusual investment objectives or more complex strategies and are designed to deliver geared exposure over a specific period of time. Such

products are therefore unsuitable for a long-term investor with a preference for simple and transparent products and will not be used in the portfolio. UCITS compliance offers additional risk protection through stringent regulatory requirements relating to fund management, diversification, the oversight of service providers, and the protection of fund assets.

A mild tilt toward value, quality, and low volatility characteristics was integrated into the portfolio construction process. This approach is based on the logic of factor-based investing, which shows that exposure to a small number of systematic return drivers can help explain differences in expected stock returns beyond the market factor alone, and derives from the Fama and French (2015) five-factor asset pricing model. Value, quality, and low volatility factors are recognized for empirical evidence of positive risk-adjusted excess returns associated with them (e.g., Basu, 1977; Novy-Marx, 2013; Ang et al., 2006). Historically, individual factors have exhibited relatively low correlations with one another, and navigate different phases of market cycles, which implies that a combination of them may help build a more resilient portfolio, depending on the risk tolerance and market outlook. The tilt toward these factors is implemented through a systematic ETF screening and selection process.

4.2 Macroeconomic Outlook

This section provides a macroeconomic background against which the later Strategic Asset Allocation will be formulated. Its purpose is to establish a setting in which portfolio choices must be made. It summarises the prevailing growth, inflation and policy environment, highlights the main cross-regional differences, and identifies the main risks that should be considered.

The global environment in early 2026 is characterised by a combination of resilience and heightened vulnerability.

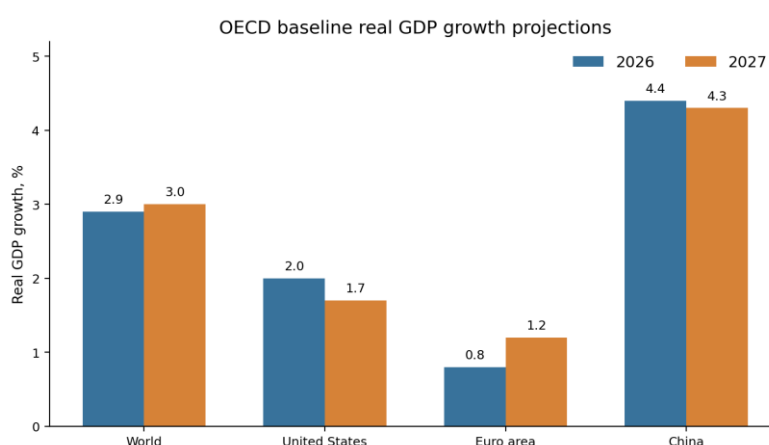
According to the OECD's March 2026 Interim Economic Outlook, the ongoing conflict in the Middle East has brought considerable human and economic costs to the countries most directly affected, while also creating a significant test for the resilience of the global economy. Reduced shipments through the Strait of Hormuz and the closure or impairment of energy infrastructure have contributed to a sharp rise in energy prices and disruptions in the global supply of energy. Heightened financial market volatility, especially in several Asian economies, has contributed to tighter financial conditions. Nevertheless, the overall state of the financial environment remains relatively favourable in both advanced and emerging-market economies.

Before the conflict intensified, global growth had remained resilient, supported by robust investment and production linked to the artificial intelligence sector. So far, the United States has been the main driver of AI-related capital expenditure, although other major economies are also likely to benefit from these developments and may begin to expand their own AI investment at a faster pace. Sectors that have adopted AI technologies most extensively seem to benefit from stronger labour productivity growth. Overall, business conditions seem to remain strong given recent adverse market conditions. The OECD and IMF 2026 outlook reports both describe a world economy in which growth continues, but at a moderate pace and under heightened uncertainty.

As reported by the OECD, global GDP growth is forecast to moderate to 2.9% in 2026, followed by a modest increase to 3% in 2027. Regional divergence remains an important feature of the outlook. According to the OECD, U.S. growth is expected to slow from 2.0% in 2026 to 1.7% in 2027, while the euro area is projected to grow by only 0.8% before recovering modestly to 1.2% in 2027. These projections are summarized in Figure 1 below.

The IMF suggests a slightly stronger profile for the United States, forecasting growth of 2.3% in 2026 and 2.1% in 2027, but it also sees the euro area as one of the more exposed regions, where higher energy prices continue to drag on manufacturing, while the real appreciation of euro relative to currencies of countries exporting similar products adds further competitiveness pressure. Taken together, these assessments suggest a macroeconomic environment in which the United States remains relatively resilient and the euro area remains weak.

Figure 1: GDP Growth Projections



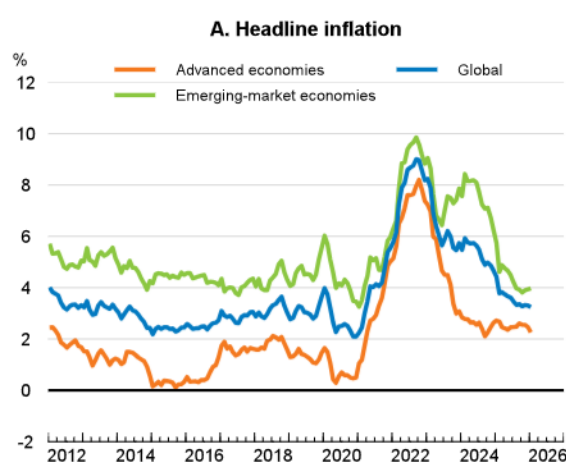
Based on: OECD (2026), OECD Economic Outlook, Interim Report, March 2026.

Inflation in several major economies is above target, and labor markets remain comparatively tight. While job vacancy indicators have declined in some advanced economies, suggesting a gradual cooling in labor demand, unemployment rates continue to be low by historical standards.

Before the conflict, headline inflation (total raw inflation rate within an economy, representing the percentage change in the cost of a comprehensive basket of goods and services, including volatile food and energy prices) remained fairly steady in both advanced and emerging-market economies. Inflation dynamics, however, evolved differently across countries. In a few major economies, including the United States, the United Kingdom, Brazil, and Mexico, it remained above the central bank targets. In China, inflation has begun to pick up following several quarters of price declines. By contrast, inflation in the euro area returned to target and remained broadly stable.

These inflation developments are illustrated in Figure 2, which shows the evolution of headline inflation across advanced economies, emerging-market economies, and the global economy.

Figure 2: Headline Inflation Developments



Source: OECD (2026), *OECD Economic Outlook, Interim Report, March 2026*.

According to the International Monetary Fund, global headline inflation is forecast to increase to 4.4% in 2026, before easing to 3.7% in 2027.

Monetary policy developments are becoming more diverse across countries. The OECD stresses that policy rates are diverging. In some economies rates remain at or near restrictive

settings, while in others policy is closer to neutral or has even been tightened further in response to renewed inflation pressure.

In the United States rates remain at restrictive levels and, given the projected increase in headline inflation, are expected to stay unchanged through the end of 2027. In the euro area, with stable inflation, rates remain close to neutral levels. A modest increase is projected in the second quarter of 2026 to maintain well-anchored inflation expectations despite elevated energy prices.

4.3 Strategic Asset Allocation

This IPS adopts a multi-asset strategy, combining different asset classes within a single portfolio. By allocating across instruments that differ in their risk-return profiles and underlying characteristics, a strategic multi-asset portfolio aims to benefit from diversification and from the flexibility to be tailored to specific investment needs.

Strategic Asset Allocation is the core portfolio-construction decision, as it translates the investor's objectives, risk tolerance, and constraints into a stable policy mix of assets. It refers to the long-term distribution of portfolio weights across the main investment categories. In the context of risks and market imbalances investors face today, the importance of SAA becomes even more pronounced. Maintaining a long-run perspective, rather than responding to short-term market fluctuations, is particularly important.

To reflect the client's more adventurous, growth-oriented risk profile, the equity allocation was set at 70%. The remaining 30% serves as a defensive and diversifying sleeve.

In place of a 70/30 split between equity and fixed income, a 70/20/10 allocation was adopted, with 10% assigned to alternatives at the expense of fixed income. BlackRock's investment strategist, Uwe Helmes, described alternatives as "the new generation diversifiers", suggesting that they are particularly relevant in the post-pandemic environment of structurally higher inflation and interest rates, together with long-term trends such as population ageing. In this context, alternatives are viewed as offering both performance advantages and flexibility in responding to changing market conditions. In the illustrative portfolio comparison presented by Helmes (2024), replacing part of the fixed income allocation with liquid alternatives resulted in improved risk-adjusted return.

Based on this logic, the proposed portfolio consists of the following asset classes:

1. Fixed Income (20%)

This sleeve is the portfolio's main stabilising and income-generating component. It remains meaningful because forward-looking assumptions for bonds continue to show potential. Amundi's 2026 Capital Market Assumptions point to higher expected returns from bonds, while Vanguard (2026) argues that high real yields make high-quality bonds attractive again. Fixed income can also provide diversification in the event that expected AI-driven productivity gains fail to materialise in the coming years.

- Euro Government

Euro Government bonds form the defensive core of fixed income. Their main role is to provide high-quality duration exposure and support portfolio stability in an environment of weak euro-area growth. However, this role should remain balanced, as inflation is still projected to remain above target, which limits the attractiveness of taking too much nominal-duration exposure.

- Euro Corporate

Euro investment-grade corporate bonds complement sovereign exposure by providing additional carry. They remain a useful part of the fixed-income sleeve, although the weak euro-area growth outlook and tight credit spreads argue for a balanced rather than dominant role for credit risk.

- Euro Inflation-Linked

Euro Inflation-linked bonds are included as a dedicated hedge against renewed and potentially more persistent inflationary pressures. Their function is to preserve real purchasing power and diversify nominal bond exposure.

- U.S. Corporate

U.S. corporate bonds broaden the credit sleeve beyond Europe and provide exposure to a market supported by a stronger macroeconomic environment.

- Aggregate

The aggregate sleeve provides broad fixed-income exposure. Its main purpose is to improve diversification, reducing reliance on any single duration or spread bet.

2. Equity (70%)

Equities remain the portfolio's primary source of long-term returns. This is consistent with a growth-oriented investor profile and with current long-term market assumptions, which continue to assign positive return potential to equities.

- Europe

European equities provide core developed-market exposure and reduce reliance on the U.S. market. Their role remains important from a diversification perspective, but the weaker euro-area growth outlook argues against making Europe the dominant equity sleeve.

- U.S.

U.S. equities remain the strongest structural growth component of the portfolio, reflecting both the relative strength of the U.S. economy and the market's central role in global innovation, particularly through AI-related investment and earnings growth. At the same time, Schwab's 2026 long term capital market expectations point to elevated valuations and high market concentration as constraints on future returns, suggesting the sleeve should not become excessively dominant.

- Asia Pacific

Asia Pacific equities broaden the portfolio's growth exposure and improve geographic diversification. Relative to Europe, the region benefits from stronger growth dynamics, but it is also more exposed to trade disruption, energy shocks, and tighter financial conditions.

3. Alternatives (10%)

Alternatives are included primarily to strengthen the portfolio's resilience. Their inclusion is justified by the need to broaden the portfolio beyond conventional asset classes, especially in periods when geopolitical risks and adverse market conditions may cause equity and bond markets to become more correlated.

- Gold

Within this portfolio, the alternatives sleeve is implemented exclusively through gold. Amundi's 2026 Capital Market Assumptions identify gold as a key strategic allocation tool, supporting both diversification and return. Historically, it has served as a strategic stabiliser, especially during equity-market drawdowns, as its correlation with equities has often remained low or even turned negative.

Alongside the policy weights, each asset class was assigned a minimum and maximum allocation. These boundaries are intended to allow the portfolio-optimization process to identify the most efficient allocation in terms of risk and return, without compromising the previously established strategic exposure, and to serve as a reference point for subsequent rebalancing. These weights were determined on the basis of the macroeconomic analysis described above and in line with the client's risk profile.

A summary of the Strategic Asset Allocation is presented in the table below:

Table 2: Strategic Asset Allocation

Asset Class	Min	Central	Max
Fixed Income	18	20	24
Euro Government	3	5	8
Euro Corporate	2.5	4	6
Euro Inflation Linked	2.5	4	6
U.S. Corporate	2	3	5
Aggregate	2.5	4	6
Equity	63	70	74
Europe	15	20	27
U.S.	30	35	40
Asia Pacific	10	15	18
Alternatives	8	10	12

4.4 Management Structure

The management structure defines the operating framework through which the Strategic Asset Allocation is translated into an investable portfolio. Its role is to connect the long-term asset-class policy exposure established in Section 4.3 with the security selection and portfolio construction process that follow. While the Strategic Asset Allocation establishes the policy weights assigned to each asset class, the management structure specifies how these allocations will be implemented and controlled throughout the investment horizon.

The portfolio will be managed through a predominantly passive implementation framework, supported by a clearly defined policy benchmark. This means that the portfolio is not designed to generate excess return through short-term market timing or discretionary security selection. Instead, the objective is to implement the agreed strategic asset allocation efficiently and to

evaluate the resulting portfolio against clearly defined reference points. This approach is consistent with the investment philosophy described in Section 4.1, which emphasizes long-term allocation discipline, diversification, cost control, and transparent implementation.

The advisor is responsible for selecting appropriate instruments within each asset-class sleeve, ensuring that the selected ETFs remain consistent with the intended exposures, and replacing instruments if their characteristics deteriorate. New instruments should be introduced only if they are consistent with the investment philosophy, satisfy the security selection criteria described in Section 4.5, and do not increase complexity beyond what is suitable for the client.

At the ETF level, each instrument will be evaluated against its own stated benchmark index. This allows the advisor to assess whether the selected fund is performing in line with the exposure it is intended to replicate, with particular attention to tracking error, fees, and liquidity. At the total portfolio level, the composite benchmark will be constructed as the weighted average of the selected ETFs' benchmark indices, using the final target allocation weights. This approach ensures that the benchmark reflects the actual structure of the portfolio.

4.5 Security Selection

The security selection process was conducted using Bloomberg Terminal and followed a two-stage structure. The first stage consisted of a qualitative screening of the investment universe while the second stage involved a quantitative comparison of the shortlisted instruments. This approach ensured that the final selection was based on a consistent set of structural, regulatory, practical and performance-related criteria.

In the first stage, the investment universe was narrowed by applying a set of core eligibility requirements. The investment universe was limited to passive ETFs, in line with the investment philosophy described in Section 4.1, which favours low-cost, transparent, and rules-based implementation. Given the European context of the portfolio, only UCITS-compliant funds were retained to ensure that the shortlisted instruments meet a common regulatory standard.

Only euro-denominated ETFs were considered. While this criterion did not remove the foreign exchange exposure embedded in non-euro underlying assets, it improved consistency in portfolio implementation and reporting.

Where multiple share classes of the same product were available, only the primary share class was retained. This prevented duplication of instruments with the same underlying exposure and ensured that each fund was included in the analysis through its most representative structure.

Inverse and leveraged products were excluded from the investment universe. Such instruments are generally designed for short-term tactical positioning and are not well suited to a strategic portfolio intended to reflect stable long-term exposures.

A minimum fund history was also required. Only ETFs with an inception date of at least ten years were retained, so that the later stages of the analysis could rely on a sufficiently long and representative data sample.

Preference was given to funds using a full or optimized replication method. Products relying on blended or derivative-based replication were excluded to ensure transparency and reduce counterparty risk.

Applying these filters created an investment universe of securities that satisfied a common set of structural, regulatory and practical requirements. This universe could then be evaluated using more detailed quantitative criteria in the second stage of the screening process. In this stage, securities were evaluated separately within each asset class outlined in Section 4.3. This approach allowed the selection process to account for the specific characteristics of each asset class and ensured that each portfolio sleeve was represented in line with its intended exposure and the overall portfolio strategy. The final selection was determined by an overall comparative assessment of the shortlisted instruments across the criteria presented in the table below.

Table 3: Quantitative Screening Criteria

Criterion	Application and rationale
Assets Under Management	All securities were required to have a minimum of €250 million in Fund Total Assets. Larger funds usually offer better liquidity, lower expense ratios and improved operational efficiency due to scale advantages, allowing for more stable operations and tighter portfolio tracking relative to the benchmark. This also reduces the risk of fund closure.
Total Expense Ratio	Only ETFs with a Total Expense Ratio lower than 0.4 were considered. Lower fees can improve the overall returns on investment, and the advantages of a low expense ratio are magnified over time, which is an important consideration given the long investment horizon.
Average Daily Trading Volume	Average Daily Trading Volume refers to the number of shares or contracts traded in a security per day. Higher values reflect ease of execution and often tighter spreads.

Tracking Error	Tracking Error is the standard deviation of the difference between a portfolio's returns and its benchmark's returns. Lower Tracking Error indicates that the ETF follows the benchmark more closely, which is relevant in a passive strategy intended to replicate a given index.
Sharpe Ratio	Sharpe Ratio measures the amount of excess return generated per unit of total risk. It is calculated as the return of an asset above the risk-free rate, divided by the standard deviation of its returns. A higher Sharpe Ratio indicates more efficient risk-adjusted performance.
Investment Grade	Preference was given to investment grade bonds.
Maturity	Bonds with very short and very long maturities were excluded as less suitable given the investor's time horizon and overall strategy. Very short maturity products were considered insufficiently representative of a core bond allocation, whereas very long maturity products were excluded due to increased interest-rate sensitivity.
Strategy	Equity ETFs with a pure growth strategy were excluded by applying a filter for either value or blend strategy.
Market capitalization	Only mid- and large-cap equity ETFs were included.
Price-to-Book ratio	Preference was given to equities with a lower P/B ratio.

Following the security selection process, a final set of 14 ETFs was selected for inclusion in the portfolio construction stage. A detailed list of ETFs can be found in Appendix Table A3.

4.6 Portfolio Construction

Portfolio construction in this IPS is grounded in Modern Portfolio Theory (MPT), first introduced by Markowitz (1952). The starting point of this approach is the idea that an investment should not be assessed only on the basis of its individual expected return, but also according to its contribution to the risk and return of the overall portfolio. Markowitz's portfolio selection model formalized this idea by showing that diversification depends not only on the number of assets held, but also on the covariance structure between their returns. As a result, combining assets that are not perfectly positively correlated can reduce total portfolio risk without proportionally reducing expected return.

The practical implementation of MPT is expressed through the mean-variance framework. In this approach, each portfolio is assessed using two main parameters: expected return and risk. Expected return is calculated as the weighted average of the expected returns of individual assets:

$$E(R_p) = \sum_i^n w_i E(R_i)$$

where w_i is the weight of asset i , and $E(R_i)$ is its expected return.

Portfolio risk is measured by variance and is calculated using the variance-covariance matrix:

$$\sigma_p^2 = w' \Sigma w$$

where w is the vector of portfolio weights and Σ is the variance-covariance matrix of asset returns.

The portfolio construction process began with the collection of historical price data from the Bloomberg Terminal. Monthly prices were retrieved for the 14 ETFs retained after the security selection stage. The sample covered the period from March 2016 to February 2026, providing ten years of monthly observations. The price data were then transformed into monthly logarithmic returns according to the following formula:

$$r_t = \ln\left(\frac{P_t}{P_{t-1}}\right)$$

The optimization was performed using Excel Solver. The decision variables were the ETF weights, while the objective was to maximize the portfolio's Sharpe Ratio, defined as the excess return earned per unit of total risk:

$$SR = \frac{E(R_p) - R_f}{\sigma_p}$$

where R_f is the risk-free rate and σ_p is the annualized standard deviation of portfolio returns.

A 10-year German Federal Bond was used as the risk-free rate proxy, as it aligns with the portfolio's euro-denominated structure and long-term investment horizon.

The optimization was conducted subject to several constraints derived from the IPS and the strategic allocation framework. The portfolio had to be fully invested, short selling was not allowed, and no individual security could exceed 10% of total portfolio value. In addition, the final weights had to remain within the predefined asset-class allocation ranges.

To evaluate the optimized allocation in the broader risk-return context, an efficient frontier was constructed. This was done by solving a series of constrained optimization problems in which expected return was maximized for selected levels of annualized standard deviation.

Figure 3: Efficient Frontier and Capital Market Line

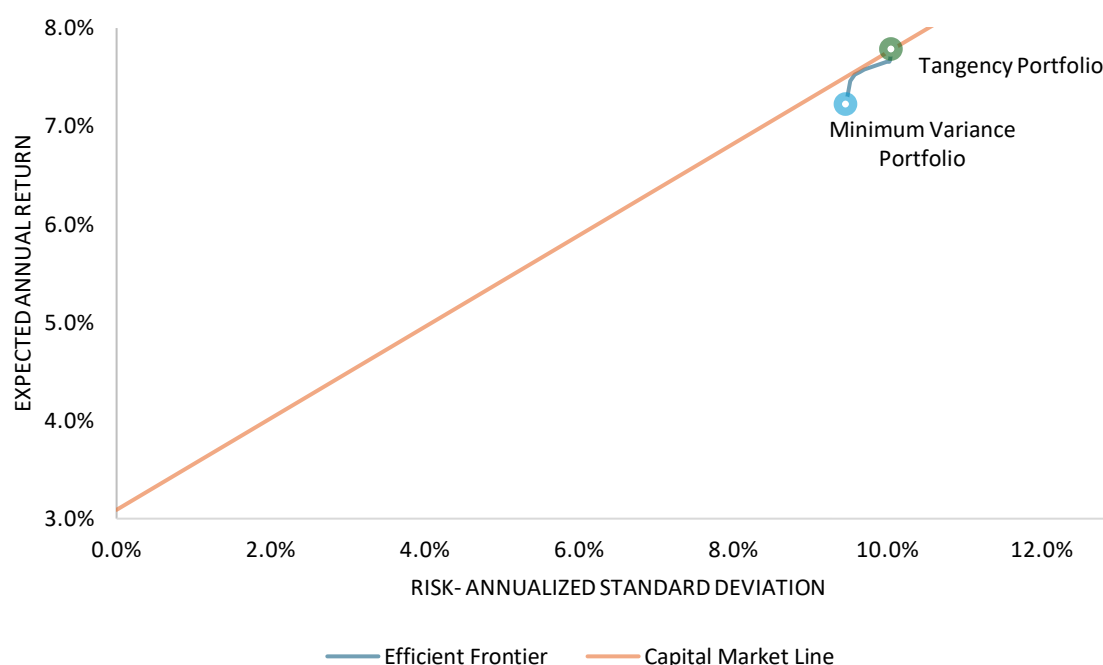


Figure 3 presents the feasible risk-return combinations generated through the constrained optimization process. The Efficient Frontier identifies allocations that maximize expected return for a given level of risk, while the Capital Market Line shows combinations of the risk-free asset and the tangency portfolio.

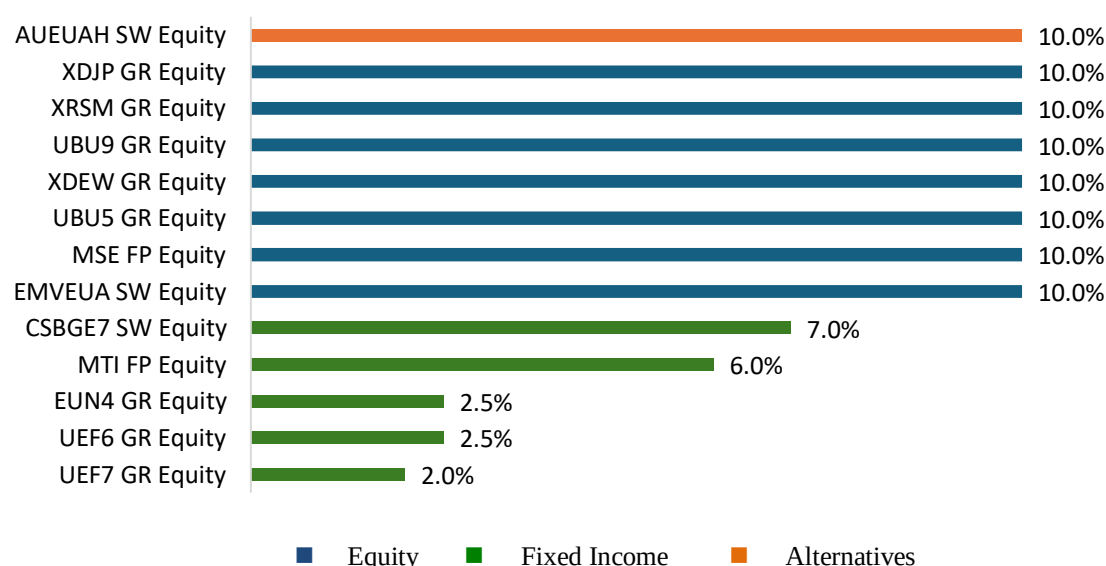
To justify the final portfolio selection, Table 4 compares the Minimum Variance Portfolio with the Tangency Portfolio. The Minimum Variance Portfolio offers the lowest level of risk under the imposed constraints, with an annualized standard deviation of 9.46%. However, its expected annual return of 7.22% remains below the client's required gross nominal return of 7.42% per annum. The Tangency Portfolio generates a higher expected annual return of 7.78%, while increasing annualized volatility only moderately to 10.05%. On this basis, the Tangency Portfolio is selected as the final portfolio, as it offers the highest risk-adjusted return among the feasible alternatives.

Table 4: Comparison of Minimum Variance and Tangency Portfolios

Portfolio	Expected Annual Return	Annualized Standard Deviation	Sharpe Ratio
Minimum Variance Portfolio	7.22%	9.46%	0.44
Tangency Portfolio	7.78%	10.05%	0.47

The final ETF-level allocation is presented in the figure below. The full names of these ETFs and their respective benchmarks are presented in Appendix Table A4.

Figure 4: Final Portfolio Composition



4.7 Monitoring

A central concern after implementation is to keep the portfolio aligned with the Investment Policy Statement. This requires continuous monitoring of the main elements established in previous sections. The proposed portfolio must remain consistent with the client's objectives, risk profile, required return target, Strategic Asset Allocation, benchmark framework, and investment constraints. For this reason, the monitoring process is organized across several levels, as summarized in the table below.

Table 5: Monitoring Policy

Type	Frequency	Purpose
Allocation monitoring	Monthly	Check whether asset-class weights remain within allowed ranges
Performance monitoring	Quarterly	Compare performance against benchmark and required return
IPS review	Annually	Confirm whether objectives, constraints, and strategy remain consistent and feasible
Additional review	When needed	Triggered by major life or market changes and unexpected events

Asset-class allocations will be reviewed on a monthly basis against the minimum and maximum ranges established in the Strategic Asset Allocation. If an asset class moves outside its assigned range, the portfolio should be rebalanced.

Portfolio's performance will be reviewed quarterly. Absolute performance will be measured in relation to the client's required gross nominal return of 7.42% per annum, as defined in the return objective. Cumulative return since inception and annualized return metrics will be monitored to assess whether the portfolio remains on track to meet the required terminal value.

Relative performance will be evaluated against the composite benchmark described in Section 4.4. This will include excess return versus the composite benchmark and tracking error. These benchmark-relative measures are useful because they help distinguish between market-driven performance and implementation quality.

The review will also include selected risk-adjusted performance measures, including the Sharpe Ratio, Sortino Ratio, and Treynor Ratio. The Sharpe Ratio is the primary measure, as it is consistent with the optimization process used in Section 4.6 and evaluates excess return per unit of total volatility. The Sortino Ratio complements this by focusing specifically on downside volatility, which is relevant for assessing whether negative deviations are becoming inconsistent with the client's risk profile and investment horizon. The Treynor Ratio measures excess return per unit of systematic risk, where systematic risk is measured by beta.

A formal IPS review will be conducted annually. This review will be more general and will take all elements of the IPS into consideration. Its main purpose is to confirm that the adopted strategy remains suitable for the client. The financial advisor will assess whether the client's

objectives remain attainable given the portfolio's performance and whether the assumed constraints remain reasonable.

4.8 Risk Analysis

After defining the portfolio structure and monitoring framework, it is necessary to assess the main risks embedded in the proposed allocation. The most prominent risk in investing is market risk, as it refers to the potential economic loss resulting from a decline in the market value of the portfolio. Value at Risk (VaR) is a standard measure for quantifying this type of risk. It is defined as the maximum potential loss in value of a portfolio with a given probability over a certain horizon.

To provide a comprehensive analysis of risk exposure, three VaR methodologies were applied: the parametric method, the historical simulation method, and the Monte Carlo simulation method. These different approaches are included to provide a more robust assessment of downside risk, as each method relies on different assumptions: the parametric method offers a simple variance-based estimate, usually assuming normally distributed returns, the historical method captures losses based on observed market movements, and the Monte Carlo method allows for simulated return scenarios and a wider range of potential outcomes. As a complementary measure, Conditional VaR was calculated for all three methods. CVaR is an extension of VaR and represents the average loss conditional on exceeding the VaR cutoff.

4.8.1 Historical VaR

Historical VaR was used as the first approach to estimate the portfolio's downside risk using past return observations. It is a non-parametric method, meaning that it does not require an assumed probability distribution of returns. Instead, it estimates the potential loss at a selected confidence level directly from the observed historical distribution of portfolio returns.

The calculation was based on the monthly price data used in the portfolio construction process. The final optimized weights were applied to the historical monthly returns of the selected ETFs in order to obtain a single time series of portfolio-level returns. The VaR estimate was then derived directly from the lower tail of this historical portfolio return distribution. For each selected confidence level, the corresponding tail percentile was identified. The results for VaR and CVaR at the 99%, 95%, and 90% confidence levels are summarized in the table below.

Table 6: 1-month Historical and Conditional VaR

Confidence level	Historical VaR (%)	Historical VaR (PLN)	Conditional VaR (%)	Conditional VaR (PLN)
99%	6.50%	259,898.03	9.13%	365,167.64
95%	4.11%	164,541.69	6.64%	265,794.49
90%	2.25%	89,801.51	4.96%	198,429.93

These results help quantify the scale of monthly losses that the portfolio could experience under historically observed adverse market conditions. At the 95% confidence level, the one-month Historical VaR equals 4.11%, corresponding to a potential loss of approximately PLN 164,542. This means that losses above this threshold would have occurred only in the worst 5% of observed scenarios. At the 99% confidence level, Historical VaR rises to 6.5%, or PLN 259,898, capturing a more extreme downside scenario. Conditional VaR values show that losses beyond the VaR threshold may be materially larger than the threshold itself. Although such severe tail outcomes are unlikely, their potential impact should be considered when assessing whether the portfolio's downside risk remains consistent with the client's risk profile and investment horizon.

4.8.2 Parametric VaR

The parametric (variance-covariance) method estimates VaR by assuming that portfolio returns follow a specified probability distribution, most commonly the normal distribution. Instead of using historical return observations or generating simulated return paths, the parametric method estimates VaR directly from the distribution's statistical parameters, namely the expected return and standard deviation.

The optimized portfolio was estimated to generate an annual expected return of 7.78%, with an annualized standard deviation of 10.05%. To ensure consistency with the one-month VaR horizon previously assumed, these annual values were converted into monthly equivalents, resulting in an expected monthly return of 0.63% and a monthly standard deviation of 2.9%.

The Parametric VaR was calculated as:

$$VaR = -V(\mu + z_{\alpha}\sigma)$$

where V is the portfolio value, μ is expected return, σ is standard deviation, and z_α is the left-tail z-score corresponding to the selected confidence level. The table below presents the estimated Parametric VaR and CVaR values across the selected confidence levels.

Table 7: 1-month Parametric and Conditional VaR

Confidence level	Z-score	Parametric VaR (%)	Parametric VaR (PLN)	Parametric CVaR (%)	Parametric CVaR (PLN)
99%	-2.3263	6.12%	244,656.35	7.10%	283,964.85
95%	-1.6449	4.14%	165,603.02	5.35%	214,074.69
90%	-1.2816	3.09%	123,459.98	4.46%	178,378.07

Under the 95% confidence assumption, the Parametric VaR is estimated at 4.14%, indicating that the portfolio is not expected to lose more than PLN 165,603 over a one-month horizon. The corresponding CVaR of 5.35% suggests that, if this threshold is exceeded, the average loss could rise to approximately PLN 214,074.

Compared with the Historical VaR results, the parametric estimates are broadly similar at the 95% level, but less severe in the extreme tail. In particular, the 99% Parametric VaR is lower than the 99% Historical VaR, and the difference is even more visible for CVaR. This suggests that the historical return distribution contains more severe tail observations than those implied by the normal-distribution assumption. The comparison highlights the value of using more than one VaR methodology when assessing downside risk.

To complement the short-term monthly estimates, the table below presents the corresponding 1-year VaR and CVaR results, offering a broader view of potential downside risk over a longer holding period.

Table 8: 1-year Parametric and Conditional VaR

Confidence level	Z-score	Parametric VaR (%)	Parametric VaR (PLN)	Conditional VaR (%)	Conditional VaR (PLN)
99%	-2.32635	15.60%	623,991.85	19.01%	760,216.12
95%	-1.64485	8.75%	350,031.16	12.95%	518,010.55
90%	-1.28155	5.10%	203,983.73	9.86%	394,303.29

4.8.3 Monte Carlo Simulation

The final stage of the quantitative risk analysis applies Monte Carlo simulation to assess the portfolio from a forward-looking perspective. This method allows a range of portfolio paths to be modelled under uncertainty. The objective was to assess how the portfolio value could develop over time and to identify both central and adverse outcomes at the end of the 10-year investment horizon. This provides useful insight, as the client's objectives are linked to a future terminal wealth level.

The simulation was based on a Geometric Brownian Motion framework, which models portfolio value as a stochastic process driven by expected return, volatility, and random shocks, using the following formula:

$$S_t = S_{t-1} e^{(\mu - \frac{1}{2}\sigma^2) + \sigma Z_t}$$

where S_t is the portfolio value in year t , μ is the annual expected return, σ is the annualized standard deviation, and Z_t is a random draw from a standard normal distribution.

An annual expected return of 7.78% and annualized standard deviation of 10.05% were used to generate 10,000 possible portfolio paths over the 10-year investment horizon. Table 9 presents summary statistics for the simulated terminal portfolio values.

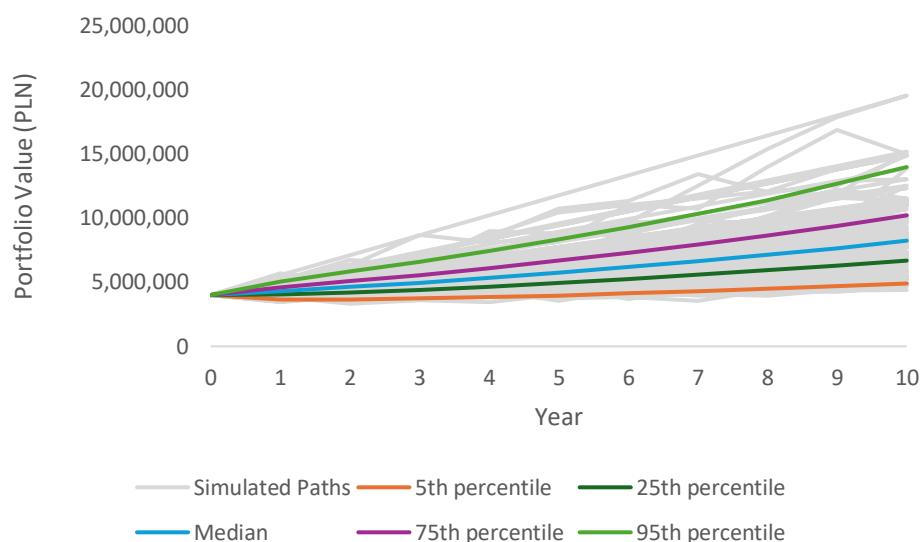
Table 9: Monte Carlo Terminal Portfolio Value Statistics

Statistic	Value (PLN)
Mean	8,668,368.04
Median	8,230,115.09
Standard deviation	2,811,940.56
5th percentile	4,892,428.65
25th percentile	6,676,768.28
75th percentile	10,196,544.72
95th percentile	13,961,503.80

The terminal value distribution provides an informative view of whether the portfolio is likely to support the client's 10-year financial objectives. The median terminal value represents the central simulated outcome. The fact that it stands above the required terminal wealth suggests that the strategy is broadly aligned with the client's target. The 5th percentile is particularly

important from a risk-management perspective, as it indicates the approximate value in a weak but still realistic scenario. In contrast, the 95th percentile illustrates the upside potential that may be achieved under favourable market conditions. The simulated portfolio paths are presented in Figure 5.

Figure 5: Monte Carlo Simulation of Portfolio Value Paths



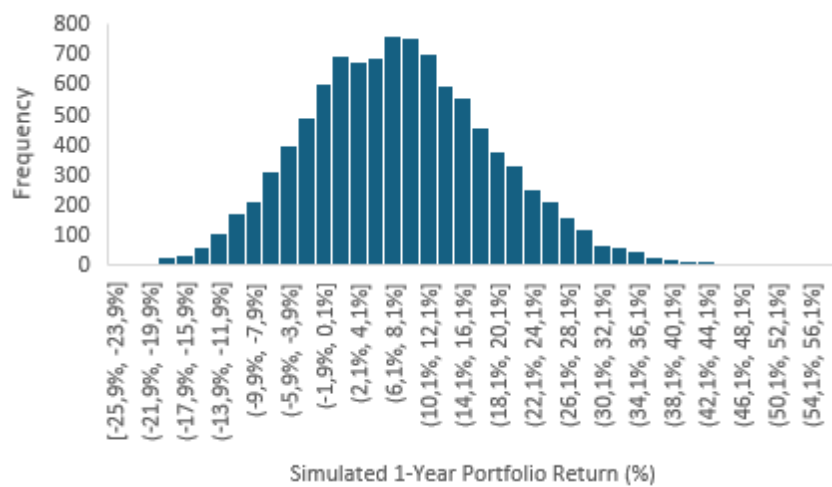
The same simulated paths were then used to estimate 1-year Monte Carlo VaR and CVaR. Results are summarized in the table below.

Table 10: 1-year Monte Carlo and Conditional VaR

Confidence level	Monte Carlo VaR (%)	Monte Carlo VaR (PLN)	Monte Carlo CVaR (%)	Monte Carlo CVaR (PLN)
99%	14.68%	587,282.54	17.51%	700,221.28
95%	8.92%	356,683.61	12.52%	500,928.39
90%	5.49%	219,722.18	9.77%	390,955.32

The distribution of simulated 1-year returns is presented in Figure 6. The histogram shows that, although the central tendency of the simulation is favourable, the portfolio remains exposed to negative annual outcomes. The left tail of the distribution forms the basis for the Monte Carlo VaR and CVaR estimates.

Figure 6: Distribution of Simulated 1-year Portfolio Returns



4.8.4 Risk Matrix

While VaR, CVaR, and Monte Carlo simulation provide quantitative estimates of potential losses, they do not fully capture all macroeconomic and portfolio-construction risks that may influence the portfolio over the 10-year horizon. For this reason, a qualitative risk matrix was developed as a complementary tool. Its purpose is to identify the main sources of portfolio risk, assess their relative importance, and support the monitoring process established in the IPS.

The assessment uses a five-point likelihood and impact scale. The likelihood score reflects the probability that a given risk may affect the portfolio during the investment horizon, while the impact score reflects the potential severity of its effect on the portfolio value and long-term objective achievement. Figure 7 illustrates the relative position of each risk within the likelihood-impact matrix, with Table 11 presenting the detailed assessment underlying each risk category.

Figure 7: Risk Matrix

IMPACT	Very High				A	
	High			E,F	C	
	Medium			B,D		
	Low			G		
	Very Low					
		Very Low	Low	Medium	High	Very High
		LIKELIHOOD				

Table 11: 10-year Horizon Key Risks

Risk category	Portfolio-specific assessment	Likelihood	Impact
Market risk (A)	Given the portfolio's significant equity exposure, broad market declines remain the primary threat to portfolio value. A material deterioration in equity markets could significantly reduce the likelihood of reaching the terminal objective.	4	5
Interest-rate risk (B)	The bond allocation is sensitive to changes in interest rates and yield curves. An increase in yields could create valuation losses in the fixed-income sleeve, particularly for longer-duration exposures.	3	3
Inflation risk (C)	Persistently higher inflation would reduce the real value of future portfolio wealth and raise the nominal amount needed to preserve real purchasing power. It may also affect bond returns and equity valuations.	4	4
Currency risk (D)	International diversification introduces exposure to exchange-rate movements. Since the objective is measured in PLN, currency fluctuations may influence the translated value of global portfolio holdings.	3	3
Geopolitical risk (E)	Geopolitical tensions and energy-market disruptions could increase inflation, weaken growth, and trigger risk-off behaviour. These shocks may affect several asset classes simultaneously.	3	4
Macroeconomic growth risk (F)	A weaker growth environment could reduce corporate earnings, increase credit stress, and lower expected portfolio returns. This risk is important because the strategy relies on long-term capital appreciation.	3	4
Technology and productivity cycle risk (G)	Part of the long-term equity outlook depends on innovation and productivity gains. If technology-led growth disappoints or valuations adjust sharply, equity performance may be negatively affected.	3	2

5 Investment Policy Proposal

Based on the analysis developed in this IPS, the recommended policy for Mr. Adam Miller is a growth-oriented, globally diversified multi-asset portfolio implemented through passive UCITS ETFs. The proposal reflects the client's 10-year horizon, high need and ability to take risk, moderate-to-high loss tolerance, and objective of funding post-career business ventures while preserving financial flexibility.

The return objective translates the client's PLN 4,000,000 investable capital into a required pre-tax terminal value of PLN 8,180,355 by 2036, equivalent to a gross nominal return of 7.42% per year. This creates a clear need for return-seeking exposure, but it also requires a controlled framework for taking risk. The recommended policy therefore avoids both extremes: it is not defensive enough to fall short of the objective, but it is also not concentrated in equities to the point of making the outcome overly dependent on one asset class.

Table 12: Strategic Asset Allocation Proposal

Asset class	Min	Central	Max	Role
Fixed Income	18	20	24	Stability and diversification
Equity	63	70	74	Main source of growth
Gold	8	10	12	Stress and inflation hedge

The recommended allocation of 70% equities, 20% fixed income, and 10% gold is appropriate for the client's adventurous risk profile and long investment horizon. Equities provide the main engine of expected return, which is necessary given the required growth in portfolio value. Fixed income introduces a more defensive element and helps moderate total portfolio volatility. Gold complements the traditional asset classes by offering an additional source of resilience in periods of inflation pressure, geopolitical stress, or market instability.

The optimized portfolio supports the suitability of the proposal. Its expected annual return of 7.78% is above the required return, while the expected annualised volatility of 10.05% remains consistent with the client's risk profile.

Overall, the proposed IPS is recommended for implementation as a coherent and practical framework for pursuing Mr. Miller's terminal wealth objective, with ongoing monitoring and periodic reviews ensuring that the strategy remains on track over time.

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Appendix

Table A1: Client's Profile (detailed)

Personal Information	
Full Name	Adam Miller
Age	25
Nationality	Polish
Country of Residence	Poland
Marital Status, Dependents	Single, no dependents
Employment Information	
Occupation	Professional tennis player
Career Stage	Active professional, approximately 10 years remaining until retirement
Gross Annual Income	Variable from year to year, derived primarily from tournament prizes and marketing contracts
Investment Objectives	
Investment Amount	PLN 4,000,000
Investment Horizon	10 years
Investment Objectives	<u>Primary investment objective:</u> funding future business ventures <u>Secondary investment objective:</u> accumulating additional capital to support the post-retirement period
Required Gross Nominal Return	7.42%
Other relevant information	
Financial Knowledge and Investment Experience	Familiarity with fundamental financial concepts Basic prior investment experience
Overall Risk Profile	Adventurous
Additional Income/Assets	Two rental properties
Liquidity Needs	No material expected withdrawals

Table A2: Risk Profiling Questionnaire

Instructions: This questionnaire consists of six sections (A-F), with each section focusing on a different aspect of behavioral loss tolerance. Please answer all the questions based on how you typically think and behave when making financial decisions. There are no right or wrong answers.

Rating scale (Questions 1-16):

| 1=Strongly Disagree | 2=Disagree | 3=Neutral | 4=Agree | 5=Strongly Agree |

A. Risk tolerance

No.	Statement	Response
1	If my portfolio declined by around 20% during a year, I could remain invested and continue with the agreed strategy rather than reducing risk.	1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐
2	A loss of EUR 10,000 would not affect me more strongly than a gain of EUR 10,000 would please me.	1 ☐ 2 ☐ 3 ☒ 4 ☐ 5 ☐
3	I am comfortable with the possibility that the portfolio may be below its starting value for an extended period.	1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐
4	I remain comfortable investing for long-term goals even when the economic outlook is uncertain.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒

B. Risk preference

No.	Statement	Response
5	To meet my long-term objectives, I am generally willing to accept meaningful interim volatility.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒
6	I prefer a strategy that is diversified across multiple sources of return, even if some parts underperform at times.	1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐
7	I am willing to hold a substantial allocation to riskier assets.	1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐
8	I am comfortable with a portfolio that may look different from commonly used investment allocations.	1 ☐ 2 ☐ 3 ☒ 4 ☐ 5 ☐

C. Risk composure

No.	Statement	Response
9	When markets move sharply, I prefer to pause and reassess, instead of acting immediately.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒
10	Negative headlines rarely push me to change a long-term plan unless there is a fundamental reason to do so.	1 ☐ 2 ☐ 3 ☒ 4 ☐ 5 ☐
11	I can follow pre-agreed rules (e.g., rebalancing, risk limits) even when doing so feels uncomfortable at the time.	1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐
12	If an investment no longer fits the strategy, I can sell it even if that means realizing a loss.	1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐

D. Risk perception

No.	Statement	Response
13	Uncertainty in my own career and financial situation affects how risky financial markets appear to me.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒
14	A short-term market decline often makes me think that the long-term outlook has also worsened.	1 ☐ 2 ☒ 3 ☐ 4 ☐ 5 ☐
15	I follow financial and economic news on a regular basis.	1 ☒ 2 ☐ 3 ☐ 4 ☐ 5 ☐
16	Market risk feels greater to me as the date of a financial goal approaches.	1 ☐ 2 ☐ 3 ☐ 4 ☒ 5 ☐

E. Financial knowledge

Choose one answer for each question

This section reproduces the Big Five financial literacy questions developed by Lusardi and Mitchell and published by the Global Financial Literacy Excellence Center.

17. Suppose you had \$100 in a savings account, and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?
- ☒ A. More than \$102
 - ☐ B. Exactly \$102
 - ☐ C. Less than \$102
 - ☐ D. Do not know

18. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?
- A. More than today
 - B. Exactly the same
 - ☒ C. Less than today
 - D. Do not know
19. If interest rates rise, what will typically happen to bond prices?
- A. They will rise
 - ☒ B. They will fall
 - C. They will stay the same
 - D. There is no relationship between bond prices and the interest rate
20. A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less.
- ☒ A. True
 - B. False
 - C. Do not know
21. Buying a single company's stock usually provides a safer return than a stock mutual fund.
- ☒ A. True
 - B. False
 - C. Do not know

F. Investing experience

22. Years of experience investing in financial markets:
- A. None
 - B. Less than 2 years
 - ☒ C. 2-5 years
 - D. 6-10 years
 - E. More than 10 years
23. Which statement best describes your past behavior during periods of market volatility?
- A. I have not experienced significant market volatility while invested.
 - B. I have experienced it and reduced exposure quickly.
 - ☒ C. I have experienced it and stayed invested.
 - D. I have experienced it and increased exposure.
24. Instruments previously used (tick all that apply):
- | | | |
|--|---|---|
| ☒ Stocks | ☐ Mutual Funds | ☐ Alternatives (e.g. REITs, commodities) |
| ☒ Bonds | ☒ Exchange Traded Funds | ☐ Other: _____ |

Table A3: Selected ETFs

Ticker	ISIN	Expense Ratio	Avg. Volume 30 Day	Tot. Asset (M)	Sharpe 3Y	Replication Strategy
CSBGE7 SW Equity	IE00B3VTML14	0.15	1574	1288.75	-0.08	Optimized
IEAC LN Equity	IE00B3F81R35	0.09	90840	13760.76	0.35	Optimized
UEF6 GR Equity	LU1048314196	0.16	8677	368.28	0.45	Optimized
MTI FP Equity	LU1650491282	0.09	1527	1356.08	-0.31	Full
UEF7 GR Equity	LU1048314949	0.16	1908	1378.69	0.01	Optimized
EUN4 GR Equity	IE00B3DKXQ41	0.16	5771	1743.96	-0.08	Optimized
EMVEUA SW Equity	LU0446734369	0.25	4115	371.27	1.47	Full
MSE FP Equity	FR0007054358	0.20	406619	4426.28	0.81	Full
UBU5 GR Equity	IE00B78JSG98	0.20	1893	557.16	0.69	Full
XDEW GR Equity	IE00BLNMYC90	0.15	48008	13021.66	0.56	Full
UBU9 GR Equity	IE00B7K93397	0.03	2493	3892.19	1.08	Full
XRSM GR Equity	IE00BJZ2DC62	0.07	2657	657.89	1.04	Full
XDJP GR Equity	LU0839027447	0.09	63274	421724.00	0.85	Full
AUEUAH SW Equity	CH0106027144	0.23	9447	939.42	1.67	Physical

Source: Bloomberg (2026)

Table A4: Final Portfolio Composition and Benchmark

Name	Benchmark
ISHARES EUR GOVT 3-7Y ACC	Bloomberg Euro Government Bond 3-7
UBS ETF B. EUR AR.LIQ.C. 1-5	Bloomberg Euro Area Liquid Corporates 1-5
AM EU GOV INF LNK BD-ETF ACC	Bloomberg Euro Government Inflation-Linked Bond
UBS ETF US L. C. H. CHF 1-5	Bloomberg US Liquid Corporates 1-5
ISH EU AG BD ESG SR UCITS-EU	Bloomberg MSCI Euro Aggregate and Green Bond ESG SRI
UBS ETF MSCI EMU VALUE	MSCI EMU Value
AMUNDI EUROSTOXX 50	EURO STOXX® 50
UBS ETF MSCI USA VALUE	MSCI USA Value
X S&P 500 EW 1C	S&P 500® Equal Weight
UBS ETF S&P 500	S&P 500®
X MSCI USA SCRND 1C	MSCI USA Select Screened
X NIKKEI 225 1D	Nikkei 225®
UBS ETF GOLD H. EUR	Gold (EUR Hedged)

Source: JustETF (2026)

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Zofia Zagórska, June 2026