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Item No. 13 on the Agenda: UNIDROIT Pension Reserve Fund – Proposal for investment in the financial markets

(prepared by the UNIDROIT Secretariat)

Summary	*Proposal regarding the long-term investment of UNIDROIT's pension fund assets in the financial markets*
Action to be taken	*To approve the proposed investment strategy*
Related documents	UNIDROIT 2024 – F.C. (97) 4; UNIDROIT 2024 – F.C. (98) 7; UNIDROIT 2024 – A.G. (84) 9

I. INTRODUCTION

1. As anticipated to the Finance Committee at its 97th and 98th session (F.C. (97) 4; F.C. (98 7) 4), and as explained in document A.G. (84) 9, the indicative threshold for the investment of UNIDROIT's Pension Reserve Fund (PRF) assets in the financial markets has been reached[1]. Therefore, the International Service for Remunerations and Pensions (ISRP), which manages UNIDROIT's PRF assets since 2019, has prepared a Report setting out three possible strategies for the long-term investment of the PRF assets (please see the Annexe). This document briefly describes the three strategies and, in line with the recommendation of the CAF, proposes to adopt the investment strategy that is already used by other CAF organisations.

II. PROPOSED INVESTMENT STRATEGY

2. To identify appropriate investment strategies, the Report considers that pursuant to Article 2.3 of the Statute of UNIDROIT's Pension Fund (2019), *"[t]he UNIDROIT General Assembly shall take the appropriate decisions in order to ensure the long-term viability of the Fund. It shall issue to the Secretary-General guidelines and goals in respect of the investment of Fund assets*." Therefore, ensuring the long-term viability of the PRF is a main objective.

3. Within the CAF, two different approaches are used to measure long-term viability:

[1] Since 2022, the indicative threshold for investment had been set at € 900,000. This threshold was reached in the first quarter of 2024. By end-August 2024, the total assets of UNIDROIT's PRF had increased to € 1,1 million.

- "balanced cashflows" approach, which requires a return such that in aggregate, over 76-80 years inclusive, the projected expenses related to the PRF (benefits and administrative expenses) are equal to projected contributions plus projected investment returns. According to the ISRP's calculations, the required annual nominal return to achieve the objective of this approach would be 5.5%.
- "depletion avoidance" approach, which seeks to ensure that the PRF does not deplete over the projection period (typically 80 years). According to the ISRP's calculations, the required annual nominal return to achieve the objective of this approach would be 4.9%.

4. In consultation with the IRSP, the UNIDROIT Secretariat concluded that the "balanced cashflows" method was to be preferred. This mostly because the risk of the "depletion avoidance" approach is that the Fund might be close to depletion at the end of the projection period, even if it is not technically depleted yet. Therefore, in the remainder of the Report, a target annual return of 5.5% is used.

5. The three possible investment strategies outlined in the Report are, in short:

- Option (a): "Target-focussed" strategy.
  Composition: 70% Equities, 15% Fixed Income, 15% Alternatives.[2]
  The expected return would be 5.5% and the volatility 12.7%.
  Advantage: it meets the target annual return from the beginning.
  Disadvantage: it has higher short-term risks given the higher volatility.

- Option (b): "Low-risk" strategy.
  Composition: 40% Equities, 50% Fixed Income, 10% Alternatives.[3]
  The expected return would be 4.7% between 2025-2028 and thereafter 5.1%. The expected volatility would be 8% between 2025-2028 and 10% thereafter.
  Advantage: it mitigates liquidity risk in the first years, when relatively high benefit payments might be payable.
  Disadvantage: it does not meet the target annual return.

- Option (c): "CAF 1" strategy.
  Composition: 55% Equities, 30% Fixed Income, 15% Alternatives.
  The expected return would be 5.1% and the volatility 10%.
  Advantage: it has a reasonable balance between risk and return, and provides a middle-ground solution compared to options (a) and (b). Furthermore, it is the strategy adopted by the PRFs of three other CAF organisations[4] and has thus previously been recommended and tested by the CAF.
  Disadvantage: it does not meet the target annual return.

6. Over the short term, the "target-focussed" has the highest risk while the risks are lowest under the "low-risk" strategy.[5] Over the long term, all strategies produce a viable solution.

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[2] Euro area listed real estate and global direct real estate

[3] This strategy assumes that the CAF1 strategy (option (c)) would be implemented as of 2029.

[4] European Union Institute for Security Studies (EUISS), European Union Satellite Centre (EU SatCen), Hague Conference on Private International Law (HCCH).

[5] The Report notices that the liquidity risk deriving from benefit payments (leaving allowances to be paid when staff members leave the organisation prior to reaching ten years of service) could be reduced by (i) holding several months' contributions to the PRF in cash so there is a lower risk of having to sell assets, and/or (ii) advancing the leaving allowance from UNIDROIT's budget and then paying subsequent monthly contributions UNIDROIT's budget until the financing has been repaid. However, the Report takes a prudent approach and does not consider these potentially mitigating options.

7. At its 31st meeting in November 2024, the CAF considered these three options and agreed to recommend option (c) to the UNIDROIT Secretary-General[6], considering that it better mitigates liquidity risk than the target-focussed approach but has a higher estimated return than the low-risk approach. As the Report indicates, it provides an adequate middle-ground solution.

8. The Secretary-General proposes to the General Assembly to follow the recommendation of the CAF and thus, to approve option (c). The accompanying risk appetite statement for option (c), also to be approved by the General Assembly, is as follows:

> Risk appetite statement: "*The General Assembly approves the implementation of a strategic asset allocation with an expected long-term target return of 5.1% and expected volatility of 10.0%. Whilst the strategic asset allocation is lower than the required return of 5.5%, it provides suitable diversification for the PRF's assets with an acceptable level of volatility for the long term. The General Assembly accepts the potential liquidity risk arising from the turnover of key personnel, in order to reach a higher return than other less volatile strategies.*"

9. The CAF approved the following risk tolerance statement:

> "*The CAF regularly reviews the investment performance of the PRF to ensure that returns are evolving in-line with the strategic asset allocation. In the event that returns are not consistent with the objective of the PRF, this would be raised to the General Assembly for consideration and potential action. It is understood that there will be short-term volatility in the investment returns which may result in assets being sold from the PRF to meet benefit obligations and any response should be consistent with the long-term objective*."

10. If the General Assembly would approve the proposed investment strategy, its implementation may take up to six months. Steps to be taken in this period include selecting, and negotiating with, asset managers of identified mutual funds, engaging a custodian bank, and an external performance consultant. The Secretariat would regularly report to the Finance Committee on the implementation of the investment strategy, and would update the General Assembly at its next session in 2025.

11. The investment strategy would be reviewed and possibly updated every five years, i.e., the first review would take place in 2029.

III. ACTION TO BE TAKEN

*11. The General Assembly is invited to take note of the proposals regarding the investment of UNIDROIT's Pension Reserve Fund assets in the financial markets (**Annexe**), and to approve the proposed "CAF 1" investment strategy (option (c)), in line with the recommendation of the CAF. Please note that the Annexe is confidential*

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[6] Pursuant to Article 31 of the UNIDROIT Regulations, the Secretary-General is "*authorised to invest such funds as are not necessary for the immediate running needs of UNIDROIT, on the condition that he take due care in making investments and in selecting establishments in which he has no vested interest. The Secretary-General shall report on the results of any such investments.*"

ANNEXE

CAF
INVESTMENT POLICY & STRATEGY OF THE PENSION RESERVE FUND OF UNIDROIT

FOR INTERNAL USE

CAF/WD(2024)38 **6 November 2024**

COMMITTEE FOR THE ADMINISTRATION OF FUNDS
INVESTMENT POLICY & STRATEGY OF THE PENSION RESERVE FUND OF UNIDROIT

ACTION:

The Committee for the Administration of Funds is invited to take note of the information presented in this document and to approve the main conclusions that will be presented to the Secretary General for approval by the General Assembly of UNIDROIT.

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COMMITTEE FOR THE ADMINISTRATION OF FUNDS
INVESTMENT POLICY & STRATEGY OF THE PENSION RESERVE FUND OF UNIDROIT

Background

1. In September 2019, the International Institute for the Unification of Private Law (UNIDROIT) (or the Organisation) established a pension scheme for staff. Prior to the establishment of the new pension scheme, staff were affiliated to the Italian Social Security system. Some staff remain affiliated to the Italian Social Security system having chosen not to join the new pension scheme established in 2019. The administration of the Pension Reserve Fund (PRF), which was set up at the same time as the new pension scheme, was externalised to the ISRP. UNIDROIT joined the Committee for the Administration of Funds (CAF) on 6 September 2019.

2. Since inception, contributions received by the PRF have been placed in money market investments (principally term deposits). UNIDROIT now intends to invest the PRF in financial markets according to a strategic asset allocation (SAA) which meets UNIDROIT's objectives.

3. The CAF is invited to discuss and make a recommendation to the Secretary General of UNIDROIT on the Investment Policy and Investment Strategy suitable for the PRF such that the UNIDROIT General Assembly can *"…take the appropriate decisions in order to ensure the long-term viability of the Fund [PRF]."*[1]

4. The following sections first present a summary of the report and the investment policy and strategy for approval by the Member States. Next follows a detailed analysis of two options for the investment strategy, both designed to achieve the PRF's target return. The Annex to this document presents a summary of the assumptions used to create the pension benefits projections.

[1] Paragraph 2.3 of the "Statute of the Fund"

Summary

INVESTMENT POLICY

5. The PRF's statute states that "*The UNIDROIT General Assembly shall take the appropriate decisions to ensure the long-term viability of the Fund [PRF].*" To meet this requirement defined in the PRF's statute, it is necessary to examine the definition of the *long-term viability of the PRF* and how to measure it, such that there is a well-defined target for the SAA.

6. Long-term viability can be defined in various manners. Within the CAF organisations there are two separate methodologies used to define long-term viability[2]:

a. "Balanced Cashflows" being defined as projected expenses (benefits plus administrative expenses related to the PRF) being equal to projected contributions plus projected investment returns in aggregate over the last five years of the projection period (typically years 76-80 inclusive).

b. "Depletion Avoidance" being defined as attempting to delay depletion of the Fund as far as possible into the future without recourse to additional contributions from Member States.

7. These two approaches are related - the "Depletion Avoidance" target is a consequence of the required return being unachievable with a SAA that has a reasonable level of risk without supplementary contributions which would be required for the "Balanced Cashflows" approach.

8. The required return under each objective may be determined using actuarial projections. For the purposes of establishing the investment policy and strategy, actuarial projections of the benefits and contributions were provided to UNIDROIT and produced based on agreed assumptions and parameters relevant to UNIDROIT[3].

9. Based on the investment objective definitions outlined above, the Secretariat has determined the required return for each objective, based on the actuarial cash flows and including all expenses related to the operation of the PRF, as set out below:

Table 1: Determination of required return

Methodology	Required Annual Nominal Geometric Return[4]
Balanced Cashflows	5.5%
No Depletion	4.9%

10. Based on discussions with UNIDROIT, there is a preference to use a balanced cashflows methodology and so a return of 5.5% (or more) is to be targeted.

11. The risks attached to setting an investment policy have also been analysed. In particular, it was noted that there is a significant liquidity risk in 2028. If the Secretary General were to leave UNIDROIT in 2028 (the current end of the appointment), then a leaving allowance would be due which could not be financed by 2028 annual

[2] Note that all CAF Organisations use the same requirement of "long-term viability" within their respective statutes.
[3] As set out in the document provided to UNIDROIT: "Cashflow and PRF Projections" SIRP/E(2024)26
[4] A geometric average return is the average annual return (growth rate) of a compounded return (series).

contributions alone. In this case there would be a requirement to sell assets from the PRF to pay the benefit. If this were to happen at the same time as investment returns being below expectations, then this could result in a significant fall in the PRF, potentially impacting its long-term viability.

12. In addition, it is noted there were only 12 employees affiliated to the UNIDROIT pension scheme at 31 July 2024. Therefore, the accuracy of the actuarial projections should be treated with caution as any unforeseen movement in personnel could have a significant impact on the cashflow requirements and may require capital to be drawn from the PRF.

13. Other risks related to the PRF were also analysed including the feasibility of investments, portfolio diversification and risks related to the investment of the assets.

INVESTMENT POLICY – CONCLUSION

Based on the “Balanced Cashflows” approach, the required annual return is 5.5%.

INVESTMENT STRATEGY

14. The General Assembly will need to approve the Investment Strategy deemed to meet the PRF’s objectives. The CAF has analysed various options for implementation of a strategic asset allocation. Whilst only the target-focussed strategy meets the required return in the long term, the short-term risk, particularly in respect to liquidity risk, is different between the two options.

15. The options considered by the CAF are:

Table 2: Investment strategy options

Option	Geometric Return	Volatility	Considerations
Target-focussed	5.5%	12.7%	Achieves target return from implementation. May have higher short-term risks.
Low Risk-focussed	4.7% (2025-8) thereafter 5.1%	8.0% (2025-8) thereafter 10.0%	Lower-risk SAA implemented until liquidity risk is reduced. SAA would be adjusted in 2029 to achieve long-term target return in aggregate.
CAF 1	5.1%	10.0%	Reasonable risk-return profile implemented by other CAF Organisations.

16. The target-focussed option has significantly higher volatility than the current SAAs implemented by other CAF Organisations due to the large allocation to higher-risk assets (70% equity). This may be perceived as an aggressive strategy whose high volatility could increase the liquidity risk for the PRF.

17. The alternative options presented, whilst not achieving the required return, provide fewer volatile returns which could mitigate short-term risks to the PRF and provide a more balanced and diversified portfolio.

18. Note that for the purposes of the analysis, it has been assumed that for the low risk-focussed option, the CAF 1 SAA would be implemented in 2029 for the long term. However,

a suitable SAA to be implemented in 2029 will be analysed at the appropriate time which may be different from the CAF 1 SAA presented here.

19. In creating suitable investment strategy options, market risk and liquidity risk of the PRF as well as the projected cashflows are considered. In light of these issues, the CAF considered the following options for the implementation of a strategic asset allocation:

Table 3: Strategic asset allocation for the PRF by investment strategy option

	SAA		**Target-Focussed**	**Low Risk-Focussed**	***CAF 1***
Asset Class	Sub Asset Class				
Equities	Global (Developed) Equities		30%	25%	35%
	Euro Area Equities		22%	10%	10%
	Emerging Markets Equities		18%	5%	10%
	Total Equities		*70%*	*40%*	55%
Fixed Income	Global Government Bonds (EUR Hedged)		5%	30%	15%
	Global Investment Grade Corporate Bonds (EUR Hedged)		5%	15%	10%
	Emerging Markets Sovereign Bonds – Hard Currency (EUR Hedged)		5%	5%	5%
	Total Fixed Income		*15%*	*50%*	30%
Alternatives	Euro Area Listed Real Estate		15%	10%	10%
	Global Direct Real Estate		0%	0%	5%
	Total Alternatives		*15%*	*10%*	15%
	Total Portfolio		*100%*	*100%*	100%
	Expected Return	*Nominal Geometric*	5.5%	4.7%	5.1%
		Real Geometric (2% inflation)	3.4%	2.6%	3.0%
	Volatility		*12.7%*	*8.0%*	*10.0%*

20. The CAF considered the short- and long-term risk implications of the options for the PRF, looking at the projected development of the PRF as well as the dispersion of returns under each investment strategy considering the projected cashflows and investment returns of each option above.

21. The CAF also considered the risk to the PRF of a large benefit payment being made in 2028 which would need to be financed by the PRF. This was highlighted as a potential liquidity risk based on the actuarial projections provided to UNIDROIT. If this occurs, it is estimated that benefit payments in 2028 could require up to 25% of the PRF at that time being liquidated to meet the cash requirements. The viability of the PRF could be put at risk if the PRF must be partially liquidated to meet this benefit payment at the same time as investment returns being lower than expected. Such an event could result in a significant fall in the value of the PRF which would then place the viability of the PRF at risk in the long term[5].

22. Prior to implementation of a new SAA in 2029, it is suggested that a further review is undertaken to consider the updated cashflow projections for the PRF and inform UNIDROIT and the CAF of any changes in the SAA required to meet the PRF's long-term objectives.

[5] The impact on the PRF of a potentially large benefit payment in 2028 may be alleviated by contributions being financing of the benefit being provided from UNIDROIT's budget with future pension contributions being paid to UNIDROIT to cover the financing. However, this has not been considered in this report which takes a conservative view on the PRF financing. However, significant cash holdings may also have the effect of reducing the returns to the PRF which may result the PRF not achieving its required return.

INVESTMENT STRATEGY – CAF RECOMMENDATION

The CAF is requested to make a recommendation to the Secretary General of UNIDROIT for approval by the General Assembly on the investment strategy option to be implemented and the accompanying risk appetite and risk tolerance statements.

FULL REPORT ON THE INVESTMENT POLICY AND STRATEGY OF UNIDROIT'S PENSION RESERVE FUND

1. Introduction to the PRF

1.1. Fund Value

1. The value of the PRF as at 31 August 2024 used in this analysis, was EUR 1.1 million. The PRF is invested in various term deposits which have been renewed at the best available rate found by the Secretariat upon expiry since UNIDROIT joined the CAF in September 2019.

1.2. Investment Fees

2. Administration fees, which include CAF fees, Custodian fees and performance provider fees, have been considered within the funding analysis. Total estimated fees for 2025, being the assumed first year of investment, are approximately EUR 48 000[6]. Asset management fees related to the selected investments and vehicles are included in the analysis as part of the target return.

1.3. Projections

3. Projections of benefits, salaries and contributions were provided to UNIDROIT by the Secretariat and have been used in the scenario illustrations below to establish the investment policy. Summary details of the assumptions and parameters used as part of the actuarial projections' work is set out in ANNEX A. Actuarial Assumptions.

4. Whilst the actuarial projections have been provided based on the inclusion and exclusion of CAF fees from the PRF, the analysis in this report focuses on the most prudent cash flow projections, being those which include all administrative expenses related to the ongoing operation of the PRF.

5. It should be highlighted that the actuarial projections used have some degree of assumption and model risk given the size of UNIDROIT. However, the robustness of the projections and conclusions have been verified with the examination of various scenarios. Details of the various scenarios are set out in paragraph 33.

2. Investment policy

6. The PRF's statute states that "The UNIDROIT General Assembly shall take the appropriate decisions to ensure the long-term viability of the Fund [PRF]."

7. To consider different investment policies, different measurable objectives are possible such that the PRF's long-term viability can be assured.

8. "Balanced Cashflows" approach to long-term viability seeks to ensure that the PRF eventually reaches a stable position that the fund is not required to grow exponentially, whilst ensuring that future benefits can be paid using the projected contributions and projected investment returns. This methodology provides a required return such that in aggregate, over years 76-80 inclusive, projected expenses (benefits and administrative

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6 This amount consists of costs for the custodian and performance consultant as well as annual CAF fees. The fees for the custodian and performance consultant are assumed to increase with inflation and the CAF fees are related to the size of the PRF.

expenses) are equal to (i.e. financed by) projected contributions plus projected investment returns. The advantage of this approach is that it focuses on the long-term cashflows and ensures that there is no strain on the Fund. However, the disadvantage is that there is a high degree of dependency on the accuracy of the projections for years 76-80.

9. Based on the actuarial projections, the annual target nominal return required to achieve the “Balanced Cashflows” objective to ensure long-term viability is 5.5%.

10. “Depletion Avoidance” approach to long-term viability seeks to ensure that, as a primary goal, the PRF does not deplete over the projection period (typically 80 years). The advantage of this approach is its ease of understanding. However, the disadvantage is that at the end of the projection period, the PRF may be close to depletion, without technically depleting as the PRF could be fully utilised to pay projected benefits.

11. Based on the actuarial projections, the annual target nominal return required to achieve the “Depletion Avoidance” objective to ensure long-term viability, is 4.9%.

12. The “Balanced Cashflows” approach is the objective used by CAF Organisations for establishing the required return which informs the construction of the SAA. However, in some circumstances, it is not possible to achieve this objective with a return that has a reasonable risk and/or without supplemental contributions. If the CAF Organisation is not in a position that supplemental contributions are possible, then the objective should be “Depletion Avoidance”. If, even under the “Depletion Avoidance” objective, the required return is not attainable, then the objective decided by other CAF Organisations has been to extend the life of the PRF as much as possible.

13. A summary of the required annual nominal geometric return under each methodology is shown in Table 4 below:

Table 4: Determination of required return

Objective	Required Annual Nominal Geometric Return
Balanced Cashflows	5.5%
No Depletion	4.9%

14. Based on discussions with UNIDROIT, there is a preference to use a balanced cashflows methodology and so a return of 5.5% (or more) is to be targeted.

2.1. Risk Considerations

15. The CAF has examined the level of risk, with regards to the long-term objective and the variations in the funding situation that could be borne by the PRF, to estimate what could be a reasonable return and risk.

16. Apart from this quantitative analysis, UNIDROIT should consider the appropriate investment strategy to be implemented based on its risk appetite and risk tolerance as this informs the construction of a suitable SAA and is a fundamental aspect of the holistic risk management of the PRF[7]. A higher risk appetite and risk tolerance implies willingness to

[7] See “Pension Risk Management – Holistic In-Depth Analysis” [CAF/WD(2023)26]” for further details on the risk management of pension schemes.

implement a more aggressive and higher risk (volatile) investment strategy as well as other associated risks, particularly liquidity risk in UNIDROIT's case.

17. The reasonability of the returns (and of the portfolios generating them) has been assessed as regards the following:

Cash flow profile:

18. Under the base case actuarial projections[8], until 2052, the annual contributions received by the PRF are greater than the annual benefit payments to be made. If short-term losses do not need to be realised to pay benefits, then potentially a higher risk investment strategy could be implemented.

19. In the actuarial projections provided to UNIDROIT there is a scenario investigated, which considers the impact of the Secretary General leaving in 2028. If this happened, the estimated benefit payments for that year would be greater than the annual contributions which could pose a significant cashflow risk as it would require a portion of the PRF to be redeemed to finance benefits. In this instance, if investment returns are negative that year or lower than anticipated and there is a large benefit payment to be made, then this could result in the Fund not achieving its objective. Therefore, it may be prudent to implement a less volatile and more liquid SAA until 2029 to reduce the impact on the PRF's long-term viability should benefit payments in 2028 be large in relation to the PRF's size at that time.

20. In addition, it is noted there were only 12 employees affiliated to the UNIDROIT pension scheme at 31 July 2024. Therefore, the accuracy of the actuarial projections should be treated with caution as any unforeseen movement in personnel could have a significant impact on the cashflow requirements and may result in capital to be drawn from the PRF to pay benefits.

21. The CAF noted that the financing of such benefit payments and the risk of needing to draw capital from the PRF may be reduced by:

a. The use of prior months' contributions being held in cash which would reduce the asset selling required from the PRF or

b. UNIDROIT providing financing to the pension scheme to pay the benefit so that the PRF does not need to be liquidated to meet the benefit payment. In this case, later pension scheme contributions would be transferred to UNIDROIT's ordinary budget until the financing provided had been repaid.

22. However, the present analysis considers a conservative approach to the liquidity risk posed by this potential payment and does not consider these potentially mitigating options. The availability of these options is highly dependent upon the timing and size of a potential benefit payment as well as the prior notice period to enable such financing options to be put in place.

Feasibility of the investments:

23. The size, governance and administration framework of the Fund can put some limits on the investment universe, the management style and therefore on the achievable or reasonable return. The Secretariat has considered the initial and ongoing investment size

[8] Considering UNIDROIT's small population, these dates can vary significantly in the future with small but significant staff changes.

requirements set by funds used by other CAF Organisations and considers that the required strategies could be implemented in the framework of the PRF being administered by the ISRP, under the instruction of the CAF.

24. Given the size of UNIDROIT's PRF, which was approximately EUR 1.1 million at 31 August 2024, it may be prudent to consider minimum investment sizes, in terms of monetary amounts and allocation share in the SAA, to ensure a cost-efficient SAA is implemented by avoiding too many transactions.

Portfolio diversification:

25. The optimal strategy to reduce excessive market risk whilst still obtaining an investment return (a product of market risk) is to diversify the portfolio as much as possible whilst accounting for the costs of implementation. An appropriate portfolio diversification should be a part of the design of a strategic asset allocation to establish a reasonable investment strategy and return.

Risk of the portfolio and impact on the objectives of the Organisation:

26. The PRF will be exposed to a variety of risks when investing in financial markets. Such risks may be due to both events / actions internal to UNIDROIT and the PRF (e.g. liquidity needs) as well as those external to UNIDROIT and the PRF (e.g. movements in investment markets). The risk appreciation and consideration is a key factor in the construction of the SAA to minimise the possibilities of the PRF's objectives not being met.

2.2. Risk Overview

27. It is considered that the primary outcome to be avoided is the need for additional contributions in addition to those required under the pension scheme rules to ensure the PRF's long-term viability. This may be due to an expected future depletion, requiring additional contributions to avoid this event, or, in the worst-case scenario, actual depletion of the Fund and the elimination of the PRF's assets. It should be noted that in this case, the Member States, as guarantors of the pension scheme benefits, would be required to contribute for the payment of annual benefits. It would be expected, in the case of depletion, that the annual contributions required would be significantly higher than if the PRF were not depleted. This is due to the loss of investment return that the PRF provides to help finance the benefits.

28. The main risks facing UNIDROIT relate, broadly, to the risk of benefit payments evolving unfavourably (typically benefit payments being higher than expected) and the risk of the PRF's investments and therefore its objective not being achieved.

29. In conformity with standard risk frameworks, the risks facing the PRF are considered in conformity with standard risk assessment:

a. Risk Identification

b. Risk Monitoring

c. Risk Management

30. Note that in the CAF meeting of November 2023, the CAF discussed and considered a report on "Pension Risk Management – Holistic In-Depth Analysis"[9] which covers risks to the pension scheme on a wide-ranging basis. The risks considered here are specific to the investments of the PRF.

<u>Risks Related to Benefits / Cashflows</u>

31. The ISRP has provided UNIDROIT with an actuarial report on projected benefits and cashflows. This report examined the development of the staff affiliated to UNIDROIT's pension scheme and the projected benefits and contributions under the current pension scheme rules. Various assumptions were used in the production of the projections as summarised in ANNEX A. Actuarial Assumptions.

32. Actuarial models are typically applied to large populations which makes the projections more reliable. Furthermore, the assumptions used for actuarial projections are usually based on an analysis of historic experience specific to the organisation and pension scheme. UNIDROIT has only 12 people affiliated to its pension scheme as at 31 July 2024 which increases the risk of individual events impacting the accuracy of the projections. Additionally, due to the pension scheme being recently established, historic experience of the pension scheme was not possible. Therefore, whilst the assumptions were discussed and agreed with UNIDROIT, there is significant assumption risk in the projections.

33. To examine the degree of risk associated with the pension scheme, the projections included various scenarios to consider the impact on the projections and benefits. The scenarios included:

a. High Turnover – staff turnover being significantly higher than base case which impacts the frequency of the payment of Leaving Allowances which are the main benefit payment in the early years of a pension scheme.

b. High Inflation – inflation being 1% higher than base case

c. High salary increases – real salary being +0.5% higher than base case

d. High career progression – individual salaries increasing faster due to more rapid career advancement

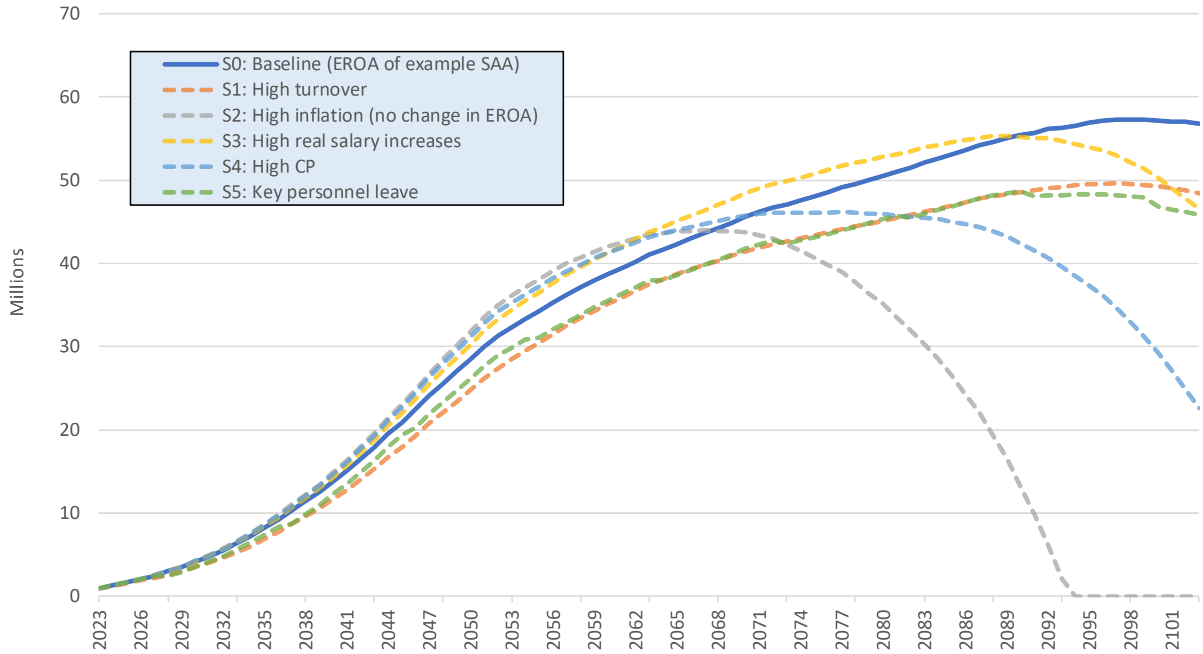
e. Key personnel leave – Key person (Secretary General) leaves just prior to achieving 10 years of service.

2. The development of the PRF, including only projected custodian expenses, with an expected geometric return of 4.68%[10] for the base case and each of these scenarios as provided in the actuarial projections to UNIDROIT is shown below:

[9] [CAF/WD(2023)26]

[10] 4.68% is the nominal expected geometric return on assets based on the strategic asset allocation proposed as an example in [CAF/WD(2019)24] and the latest long-term capital markets assumptions.

Figure 1: PRF development – Actuarial assumption scenarios



34. The scenarios of high inflation and high career progression would result in an undesirable development of the PRF in the long term although, focussing on the next 40 years up to 2065, the assumption risk is not significant- with the PRF development not being significantly impacted under all scenarios.

35. The projected benefits are lower than the projected contributions to the PRF, under all scenarios, except for the scenario relating to key personnel leaving, in all years up to at least 2051. In the scenario related to key personnel leaving, it is projected that total benefit payments for 2028 would be larger than total contributions received. If the Organisation were able to provide financing for the annual benefit payments under this scenario, then this would reduce the need to draw down the PRF in this event. Furthermore, the frequency of investment of contributions and rebalancing may also reduce the need to redeem the PRF's capital as it would allow the accumulation of funds outside of the PRF which could be used to pay benefits if necessary.

36. The monitoring of benefit payments and development of the projected benefit payments is performed via an annual Treasury Management Plan which would be agreed with UNIDROIT and presented to the CAF. In this case, any significant fluctuations of actual benefit payments compared to expected benefit payments can be highlighted and the necessary action taken when necessary.

37. It should be noted that regular reviews of the PRF which would update the assumptions and population to provide updated cashflow projections should mitigate any long-term risk to the PRF by enabling issues to be identified early. Furthermore, it was assumed that the contribution rate to be paid to the pension scheme under the current rules would stay constant throughout the projection period. The contribution rate is re-evaluated every five years in accordance with the pension scheme rules, following an

actuarial study on the benefit development. This contribution adjustment will also mitigate the risk of an unfavourable long-term development of the PRF.

Risks related to assets

38. Regarding asset risks, there are a number of risks that may result in the PRF falling short of its performance target and overall objective.

39. Market risk is the risk of a decrease in the value of the portfolio due to adverse movements in financial markets. The acceptance of some degree of market risk is essential for the PRF needs to reach its target return. Market risk can be reduced through portfolio diversification and monitored through different mechanisms. Market risk has several sources, impacting different parts of the portfolio:

- Interest rate and credit risk - in bonds
- Currency risk - in any non-domestic investment
- Company or business risk - in equities
- Political/regulatory risk - particularly in emerging markets equity
- Economic risk - in equities and bonds

40. Relative risk is the risk of deviation from the benchmark's performance which represents the target of the return of each individual asset class and the overall PRF due to: portfolio drift from the different growth across asset classes; tactical decisions related to the asset allocation; or to active management within asset classes. The relative risk stemming from the first two factors can be controlled through the rebalancing strategy and by keeping the investment portfolio close to the established long-term SAA. The third risk factor may be limited by investing in index-linked products or by imposing certain deviation limits to active asset managers and by monitoring them closely.

41. Liquidity risk is the risk of significant losses when liquidating positions or when there is no possibility of liquidation at all. The PRF can afford some liquidity risk as it is a long-term investor and has annual net inflows for approximately the next 30 years, based on the Base Case cashflow projections. However, it should be noted that under the "Key Personnel Leave" scenario examined in the actuarial cashflow projections there is an expectation that if the Secretary General were to leave in 2028 then this would result in annual projected benefit payments being larger than annual contributions in 2028. The implications of this liquidity risk are examined in further depth in this report.

42. Liquidity risk may also be mitigated by the selection of liquid asset classes which means the PRF could redeem investments, if needed, at market price. Typically, mutual funds are used in the CAF and further requirements on the mutual fund selection should result in investments being easily redeemed.

43. Counterparty risk is the risk that a counterparty may be incapable of honouring its obligations. The nature of the long-term investment vehicles usually selected by the CAF – mutual funds – does not entail a direct counterparty risk as the assets are always under the ownership of the Organisation. In the event of an asset manager bankruptcy, the PRF's

ownership of investments will not be affected[11]. Within the funds, there exists a counterparty risk for some asset classes, especially within the fixed-income asset class, which is managed by the asset managers and translated into market risk.

44. Operational risk[12] is the risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events. This risk could exist either within the administration of the PRF itself, or within the mutual funds at the level of the asset managers. The ISRP, as Administrator of eight pension funds from six international organisations, has implemented investment procedures and control mechanisms to optimise the execution and administration of the investments with the aim of reducing this risk. Regarding operational risks inside the mutual funds, the latter should be / has been analysed at the time of the asset managers' selection, where the solidity and the risk control procedures of the candidates should be a heavily weighted element in the evaluation.

45. Some pension fund managers define the main risk of funds like the PRF as the risk of losing money, whereas the risk of fluctuations in value should be considered irrelevant due to the long-term investment horizon. This is a valid view for pension funds which have net inflows, such as is the case with UNIDROIT, and in the context of mean reversion models (where market prices revert to their long-term trend). Nonetheless, it can be challenged in pension funds subject to regulatory or accounting constraints imposing a stable value, and by short-term reporting and assessment practices. According to this approach, liquidity, counterparty and operational risks are the highest, as they may lead to actual losses.

46. From the perspective of return compensation, higher risks are typically compensated with higher returns. Therefore, the PRF would obtain risk compensation for bearing liquidity, market and counterparty risks while relative risk[13] and operational risk would not be compensated.

47. Overall, the PRF's biggest exposure is to market risk as it is the most challenging to reduce whilst attempting to obtain a positive return; in parallel, it is the only risk having a budget, i.e. market risk is explicitly allowed by the investment strategy via the expected (and actual) volatility of the strategy implemented. Further analysis of the market risk and its impact on the PRF is provided below.

Market risk

48. The "risk-free option" for the Organisation would be to invest in assets with a guaranteed notional value at maturity and return, as has been the investment strategy pursued to date with the use of short-term savings contracts. Contributions could be invested into products which attempt to match the projected benefit payments, in terms of inflation, duration and amount, such that the financing of benefits is made without risk.

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[11] However, in the case of an asset manager's bankruptcy, there may be a temporary lack of liquidity, while the legal and administrative procedures are carried out.

[12] Related to operational risk, there is the very short-term market risk, measured based on financial markets' daily volatility, as it is a highly disturbing factor for operations: rebalancing operations and investment of incoming contributions. This risk, even though it comes from market fluctuations, is very much related to operational risk. Indeed, large movements in securities prices during volatile periods make portfolio valuations and corrections through rebalancing very erratic. Moreover, exit and entry prices are more uncertain than under normal conditions, which largely perturbs both the rebalancing and investment executions. Certain levels of market instability can be monitored, eventually leading to the decision to suspend rebalancing operations and/or the investment of contributions.

[13] The efficient markets' theory as well as empirical evidence shows that the relative risk coming from active or tactical management is not consistently rewarded over the long term.

Whilst theoretically possible, in practice, finding investment products which perfectly match the benefits payments is almost impossible. The "risk-free option" is typically more expensive for organisations due to the lower level of return obtained and so greater contributions are required from the organisation to finance pension benefit obligations. Furthermore, if products are used to guarantee the payment of benefits, then this would be a transfer of risk to a third party who would inevitably price in such risks through lower returns or a higher purchase price (both requiring greater contributions from the organisation).

49. Alternatively, the Organisation can finance its pension benefit obligations with uncertain and potentially higher investment income (non-guaranteed capital return) from financial markets. Investing in financial markets does entail a certain risk and the evolution of the assets will not necessarily be linked to that of the benefits to be paid. There will also be a certain short-term volatility in the value of the assets. The Organisation exchanges the certainty of the need to pay higher contributions and invest in the risk-free portfolio, for the risk of having to increase them in the future if market returns are lower than the target.

50. It is difficult to predict what will happen in the future, especially with such a long-term horizon as the one used for the objectives of the PRF. In addition, the probabilities of events lose significance when considered over such a long period. Even though the expected rate of return is the most probable average result in the long term, there is a probability of returns being higher as well as a probability of returns being lower. In parallel, it is possible to have significant market downturns over one, or multiple, years. As the PRF has positive cash inflows until 2052, based on the base case of the actuarial projections, the PRF could sustain negative fluctuations in market value on the assumption that these would be offset by positive returns in order to achieve the required return (mean-reversion model) as the PRF's capital would not need to be used to pay benefits. Although, due to the small population of UNIDROIT the cashflow projections could be significantly different from reality and therefore it cannot be ruled out that benefit payments could be higher than contributions prior to this date. Therefore, the Organisation should understand the risk that capital may be required from the PRF when approving an investment in financial markets.

51. Thus, the actual returns could be lower (or higher) than the target or expected return because of two types of situations, one short-term and another long-term. The impact of these risks in the context of the SAA is evaluated later in this document.

52. An overview of the risk framework – identification, monitoring and mitigation – for the PRF is shown in Table 5.

Table 5: PRF risk framework summary

Risk Identification	Description / Identification	Monitoring	Mitigation
Benefit Related			
Benefit payments	Benefit payments are significantly different from expectations resulting in earlier negative cashflows and potentially draw down of PRF's capital. Due to the small population, changes in personnel could significantly impact the projected cashflows and require the liquidation of some of the PRF's investments to pay benefits.	Annual Treasury Management Plan in place to consider cash flow requirements over the forthcoming calendar year. Discussed and agreed with UNIDROIT.	Regular reviews of PRF and re-evaluation of benefit projections.
Assets Related			
Market Risk	The risk of a decrease in the value of the investment portfolio due to adverse movements in financial markets.	Performance monitoring at CAF meetings.	Regular reviews of PRF and the appropriate strategic asset allocation.
Relative Risk	The risk of deviation from the benchmark's performance	Performance monitoring at CAF meetings. Fund managers may be placed on watchlist and subsequently removed if relative risk of underlying funds is considered excessive.	Regular reviews the underlying investment vehicles used to achieve the strategic asset allocation.
Liquidity Risk	The risk of significant losses when liquidating positions or when there is no possibility of liquidation at all	Annual Treasury Management Plan in place to consider cash flow requirements over the forthcoming calendar year. CAF has previously discussed the approach to negative cashflows which would be used if contributions are insufficient to cover annual benefit payments.	Underlying investment vehicles used are typically mutual funds. Liquidity availability is a key requirement when selecting a fund. However, volatility of funds should also be considered to mitigate the impact of a market downturn at the time of liquidation.
Counterparty Risk	The risk that a counterparty may be incapable of honouring its obligations	Secretariat has regular updates with asset managers and regularly questions asset	Assets are always under the ownership of the PRF.

		managers on any events that may impact the company.	
Operational Risk	The risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events.	ISRP, as Administrator, is duty bound to report any operational failures within ISRP that may impact the PRF. Secretariat's regular updates with asset managers monitors any operational events at the asset manager. Any significant operational events are reported to the CAF in the regular performance monitoring reports.	Due diligence on asset managers is performed at the time of mutual fund selection.

3. Investment strategy

53. This chapter defines the investment strategy or strategic asset allocation (SAA), which is the combination of assets necessary to meet the required return of 5.5%. It is composed of four parts: selection of investment universe, expected return and risk of the different asset classes composing the investment universe, composition of the optimal SAA and implementation style (static or dynamic).

3.1. Investment Universe

54. The proposed investment universe is that already implemented in other CAF Organisations' PRFs. The investment universe is composed of the following asset classes:

Table 6: CAF Investment Universe

Asset Class	Sub Asset Class
Equities	Global (Developed) Equities
	Euro Area Equities
	Emerging Markets Equities
Fixed Income	Global Government Bonds (EUR Hedged)
	Global Investment Grade Corporate Bonds (EUR Hedged)
	Emerging Markets Sovereign Bonds – Hard Currency (EUR Hedged)
Alternatives	Euro Area Listed Real Estate
	Global Direct Real Estate (EUR Hedged)

55. Global Equities are included as the basis of a portfolio searching for a return and having an allowance for risk, to be increased or reduced through its allocation (its share of the portfolio).

56. Global (Developed) Equities, as represented by the MSCI World index are today largely dominated by the United States, which represents over 70% of the index market capitalisation. Euro Area Equities are included to offset the bias of Global (Developed) Equities towards US equities. The inclusion of Euro Area Equities[14], whilst creating a duplicate exposure to the Euro Area stock market, offsets the bias towards US equities (and currency) and provides diversification benefits.

57. Emerging Markets Equities are part of the universe as the prospects of the emerging markets' dynamism justify the inclusion of their equity markets. In parallel, different risk and return characteristics justify singling out this asset class for separate consideration. Indeed, several aspects distinguish emerging equity markets from developed equity markets. Emerging equity markets tend to be newer, smaller, less transparent, and less liquid than developed country equity markets. As such, investments in this asset class have been largely riskier over the past 20 years than developed equity markets and are expected to continue being so. The asset class has therefore benefited and earned higher returns than developed equity markets over a 20-year period. However, these markets are maturing rapidly, becoming larger, more transparent and more liquid. Still, their expected return for the future is higher than that for developed equity markets. Finally, the emerging

[14] Represented by the MSCI EMU, whose three largest countries are France (34%), Germany (28%) and the Netherlands (15%).

economies have been, and are likely to remain, the fastest growing in the world. As a consequence, these countries' stock markets have been accounted for an ever-increasing share of total global market capitalisation - from around 1% in 1988 when MSCI launched its emerging markets index to over 10% today. Since 2013, the emerging (and developing) economies' share of the world's Gross Domestic Product (GDP) has exceeded that of developed economies (percent of world GDP, based on purchasing power parity).

58. Global (Developed) Government Bonds are fixed-income instruments issued by sovereign states from developed economies. Global Government Bonds play an important role in an investment portfolio when combined with other asset classes. In general, their inclusion in a portfolio tends to make the returns on that portfolio less volatile, as government bonds tend to fluctuate less in value than equities and other risky assets. Additionally, Global Government Bonds provide diversification benefits as, usually, bond prices tend to move in the opposite direction from stock prices. This is mainly due to the evolution of interest rates, the main determinant of government bond returns, during the business cycle. In general, when the economy is strong and stocks are rising, interest rates tend to increase, pushing down bond prices and, hence, reducing bond returns. In contrast, when economic growth is weak and stock prices are falling, interest rates tend to decrease, driving up bond prices and enhancing bond returns. This negative relationship between stock and bond price movements is far from being perfect, and at times tends to break down, in particular when inflation turns out to be much higher or lower than anticipated. Overall, however, it is sufficiently strong to justify the inclusion of Global (Developed) Government Bonds in a portfolio as a distinct asset class.

59. Global Investment Grade Corporate Bonds[15] are defined as fixed-income securities with maturities greater than one year issued by corporations with credit ratings of "BBB-" or higher. Although the reasons for including corporate investment-grade bonds in a diversified portfolio are broadly the same as for government bonds, the two markets are sufficiently different to justify their inclusion. In particular, returns on corporate investment-grade bonds are determined by the level of and change in interest rates *and* the level of and change in the additional yield, or "spread", paid to compensate investors for the risk that the company may default (credit risk). Most of the time, the extra yield earned as compensation for credit risk enhances the return on corporate bonds relative to government bonds, which advocates for its inclusion in global asset allocations.

60. Emerging Markets Sovereign Bonds[16] are defined as government bonds issued by Emerging Market countries. This asset class is attractive due to the exposure to strong economic growth in Emerging Markets compared to Developed Markets. The asset class also provides attractive yield and return characteristics compared to other fixed income asset classes included in the CAF Investment Universe.

61. Euro Area Listed Real Estate is included given the attractive risk and return characteristics of real estate investments, and especially the income component, as well as for the diversification benefits and the inflation hedge properties. Indirect (listed) investment is the most easily accessible exposure to real estate, but it is subject to factors such as the market sentiment; they are effectively part of the quoted equities universe, and thus can be correlated with it in the short term.

[15] See [CAF/WD(2020)13] for a full analysis of Global Investment-grade Corporate Bonds
[16] See [CAF/WD(2021)38] for a full analysis of Emerging Market Sovereign Bonds

62. Global Direct Real Estate[17] provides similar traits to Euro Area Listed Real Estate but due to its underlying investments, it is less correlated to equities markets. In addition, the risk return characteristics of Global Direct Real Estate as well as the inflation protection provided by the asset class makes it appropriate for inclusion in the investment universe.

63. For information, the ISRP and the CAF analysed other asset classes such as infrastructure and private equity, and taking into account the objective of the PRF, its Fund size, governance and administration framework, the CAF considered these options inappropriate.

3.2. Expected return and risk

64. To estimate the long-term expected returns of the invested asset classes, the Secretariat used (ex-ante) forecasting financial models, which are described below.

65. The Secretariat estimated the expected risk using (ex-post) historical volatilities.

66. Note that the CAF return estimations provided in this section are arithmetic expected returns. Such returns do not consider the compounding impact on the PRF as they are a simple average of forecast returns. In contrast, the target return for the PRF has been calculated as a geometric average return which considers the compounding effect of investments. Geometric returns are lower than average returns due to the compounding effect.[18]

Return

Return - Equity

67. The Secretariat estimated equity returns using an ex-ante approach based on the Gordon (constant) Growth model, itself derived from the Gordon-Shapiro model, in which the expected equity return for a given country/region equals the dividend yield plus expected dividend growth.

68. To estimate the dividend yield, the Board extrapolated historical figures for related market indices. For the expected growth of dividends, the expected nominal GDP growth of the equity market's region/country was used, using OECD real growth and inflation forecasts for the period 2024-2060 and applying relevant market indices'[19] country weights.

69. Thus, the following formula gives the projected nominal equity return:

Equity return = historical market index dividend yield + country-weighted forecast nominal GDP growth

Country-weighted forecast nominal GDP growth = (1 + country-weighted real forecast GDP Growth) x

(1 + country-weighted forecast inflation)

[17] See [CAF/WD(2021)37] for a full analysis of Global Direct Real Estate

[18] Geometric returns may be estimated from arithmetic returns by applying the formula: *geometric return = average return – 0.5*variance*

[19] MSCI World for global developed markets equities; MSCI EMU for euro area equities; and MSCI emerging markets for emerging markets equities.

70. The results provided by the formula for world and emerging markets equities are presented in Table 7 below, together with the former calculations used in PRF reviews for other CAF Organisations.

Table 7: Projected equity nominal returns

Asset Class	Dividend Yield	Country-weighted Real GDP Growth	Country-weighted Inflation	Long-Term Annual Expected Return	*2022 CAF Estimation*
Global DM equities	2.2%	1.4%	2.0%	**5.7%**	*5.7%*
Euro area equities	3.1%	1.4%	1.8%	**6.3%**	*6.1%*
Emerging markets equities	2.5%	2.5%	3.2%	**8.3%**	*7.7%*

Source: Secretariat

Return - fixed income: government and corporate bonds

71. The long-term equilibrium rate of return of government bonds (global developed and emerging markets) is projected to be equal to the long-term nominal growth of the issuers' country or region, as per the neoclassical theory[20]. Application of this ex-ante approach, together with the long-term OECD forecasts for global GDP real growth and inflation[21], and the estimated currency hedge impact gives the equilibrium return assumptions for global government bonds (EUR hedged). The currency hedging effect is considered to be an assumed cost of 0.5%, calculated as the historical return difference between the hedged and unhedged representative fixed-income indices. Contrary to equities indeed, there is clear empirical evidence of volatility being reduced by using currency hedged bond indices compared to unhedged ones. The volatility has consistently been lower for the hedged index, which should also theoretically be reflected in a lower return. This proved to be the case historically, and consistent with previous observations, the updated performance track-record still shows a difference of close to 0.5% on average.

72. Global investment-grade corporate bonds returns are estimated as the government bond return plus the historical yield spread between corporate and government bonds.

73. Table 8 presents the Board's estimates of projected returns for the fixed-income asset classes, together with the former assumptions used in PRF reviews for other CAF Organisations.

[20] Derived from Phelps' *Golden Rule of Capital Accumulation* and Solow's model, which implies an optimum growth rate can be reached when the rate of profit (interest) equals the rate of growth of an economy.

[21] Guillemette, Y. and D. Turner (2021), "The long game: Fiscal outlooks to 2060 underline need for structural reform", OECD Economic Policy Papers, No. 29, OECD Publishing, Paris, https://doi.org/10.1787/a112307e-en.

Table 8: Initial projected fixed-income nominal returns

Asset Class	Equilibrium return	Credit (Corporate) Spread Premium	Impact of EUR hedge	*Long-Term Annual Expected Return*	*2022 CAF Estimation*
Global DM government bonds (EH)	3.4%	-	-0.5%	***2.9%***	*2.1%*
Global IG corporate bonds (EH)	3.4%	+1.7%	-0.5%	***4.6%***	*3.8%*
Emerging markets sovereign bonds (HC)	6.3%	-	-0.5%	***5.8%***	*5.4%*

Source: Secretariat

Return – Alternative investments: euro area listed real estate and global direct real estate.

74. For euro area listed real estate, which is a sub-component of the overall euro area equities market, the CAF assumed that over the long term, the risk-adjusted returns measured with the Sharpe ratio[22] of euro area listed real estate and the overall euro area equities shall be equal, i.e. a riskier investment should compensate investors with higher returns and vice versa. The Sharpe Ratio of euro area equities was calculated using the ex-ante expected return as previously estimated, the "ECB all bonds 20Y" as the risk-free rate (Rf), and historical euro area equities volatility[23]. Then, using historical volatility of euro area listed real estate, the implied return was derived for euro area listed real estate as per the formula below:

Expected return for euro area listed real estate =

Rf + (euro area equities' Sharpe Ratio x euro area listed real estate's volatility)

75. For the expected return of global direct real estate, the Board decided to rely on the average of several asset managers' long-term expected returns. The assumptions of BlackRock and J.P. Morgan, the two asset managers providing the most comprehensive coverage of asset classes, were averaged.

76. The B return estimates for alternative investments' returns are presented in Table 9 below, together with the former assumptions used in PRF reviews for other CAF Organisations.

[22] The Sharpe ratio is a measure of risk-adjusted return of an asset or portfolio. It measures the excess portfolio return over the risk-free rate (Rf) relative to its volatility (i.e. its risk measured with the standard deviation). Sharpe Ratio euro area equities = (euro area equities return – Rf) / euro area equities' standard deviation.

[23] The Sharpe Ratio of euro area equities was calculated at 0.3. Volatilities used are since the common inception of *MSCI EMU* and *FTSE EPRA Nareit Eurozone Capped*, being 1 March 2005.

Table 9: Projected alternative investments nominal returns

Asset Class	**Long-Term Annual Expected Return**	*2022 CAF Estimation*
Euro area listed real estate	**6.9%**	*6.8%*
Global direct real estate	**5.6%**	*5.2%*

Source: Secretariat

Return – Comparison of the CAF estimations with those of other financial experts

77. The CAF has also considered the return estimations of other financial experts, which are presented in Table 10. The CAF notes that other financial experts have similar expected returns overall for all asset classes.

78. It is reminded that given that time horizon, currency and methodology differ among Asset Managers (which can show material amplitude between two annual publications) and the Board's estimated returns, the comparison among them need to be taken cautiously.

Table 10: Comparison of the CAF's estimations with those of other financial experts

Asset Class / Source	***CAF***	**JP Morgan AM**	**BlackRock**	**Goldman Sachs AM**	**State Street**	**Amundi**	**Allianz GI**
Currency, time horizon	***EUR, 30Y+***	**EUR, 10-15 Y**	**EUR, 30Y**	**EUR, 10Y+**	**LCL, 10Y+**	**LCL, 10 Y**	**EUR, 10Y**
Methodology[24]	*Arithmetic*	*Arithmetic*	*Arithmetic (Implied*)*	*Arithmetic*	*Arithmetic*	*Arithmetic*	*Arithmetic*
Equities							
World Developed	*5.7%*	7.0%	6.5%	-	5.90%	7.40%	5.50%
Euro area	*6.3%*	9.3%	8.8%	5.70%	6.70%	7.90%	7.30%
Emerging Markets	*8.3%*	8.4%	10.0%	5.50%	7.70%	9.20%	6.40%
Fixed-Income							
World Government Bonds EUR-Hedged	*2.9%*	3.5%	2.5%	2.70%	2.60%	3.50%	3.20%
World Corporate Bonds EUR-Hedged	*4.6%*	-	-	3.50%	3.80%	4.40%	4.10%
US IG Corp Bonds Hedged	-	5.3%	5.4%	3.50%	4.10%	5.90%	4.20%
Euro IG Corp Bonds	*3.9%*	4.1%	3.2%	3.40%	2.90%	4.10%	3.90%
EMD Sovereign Hedged	*5.8%*	6.4%	4.7%	5.20%	6.90%	6.40%	4.70%
Alternative							
Euro Area Listed Real Estate	*6.9%*	7.7%	7.3%	-	5.50%	-	
Global Core Real Estate	*5.6%*	-	4.6%	7.0%	-	-	4.5%
US Core Real Estate	-	6.5%	3.5%	-	7.20%	-	
European ex-UK Core Real Estate	-	6.1%	0.0%	-	-	-	

**BlackRock assumptions are provided in geometric terms. Using the provided volatilities, the Secretariat calculated an arithmetic equivalent, for consistency of presentation with other peer assumptions.*

[24] Estimations may be provided in arithmetic or geometric terms. Arithmetic terms imply a simple average of expected returns. A geometric return implies the average annual growth rate will be lower than the arithmetic return due to consideration of the compounding effect.

Risk Measures (Volatility)

79. Table 11 and Table 12 on the following page present the updated assumptions for volatility and correlations. These have been calculated using the historical volatility of each asset class's benchmark index, as in previous reviews. The estimated returns have also been provided in Table 11 for ease of reference.

Table 11: Estimation of volatility

Asset Class	Sub Asset Class	Return	Volatility (Standard Deviation)
Equities	Global (Developed) Equities	5.7%	13.4%
	Euro Area Equities	6.3%	16.8%
	Emerging Markets Equities	8.3%	17.4%
Fixed Income	Global Government Bonds (EUR Hedged)	2.9%	3.7%
	Global Investment Grade Corporate Bonds (EUR Hedged)	4.6%	5.2%
	Emerging Markets Sovereign Bonds – Hard Currency (EUR Hedged)	5.8%	9.7%
Alternatives	Euro Area Listed Real Estate	6.9%	20.0%
	Global Direct Real Estate	5.6%	12.1%

Source: Secretariat. Volatility is the annualised standard deviation of monthly returns observed over the longest commonly available period for each asset class's relevant market index, being 1 March 2005 (monthly data, in EUR, as of end-December 2024), except for direct real estate, for which J.P. Morgan's calculations were used.

Table 12: Correlations calculations

	Global DM equities	Euro area equities	EM equities	Global DM government bonds (EH)	Global IG corporate bonds (EH)	EM sovereign bonds (HC)	Euro area listed real estate	Global direct real estate
Global DM equities	1.00							
Euro area equities	0.85	1.00						
EM equities	0.73	0.71	1.00					
Global DM government bonds (EH)	-0.02	-0.04	-0.04	1.00				
Global IG corporate bonds (EH)	0.44	0.46	0.46	0.66	1.00			
EM sovereign bonds (HC)	0.52	0.30	0.42	0.33	0.52	1.00		
Euro area listed real estate	0.65	0.75	0.56	0.16	0.59	0.60	1.00	
Global direct real estate	0.49	0.32	0.49	-0.20	0.10	0.16	0.51	1.00

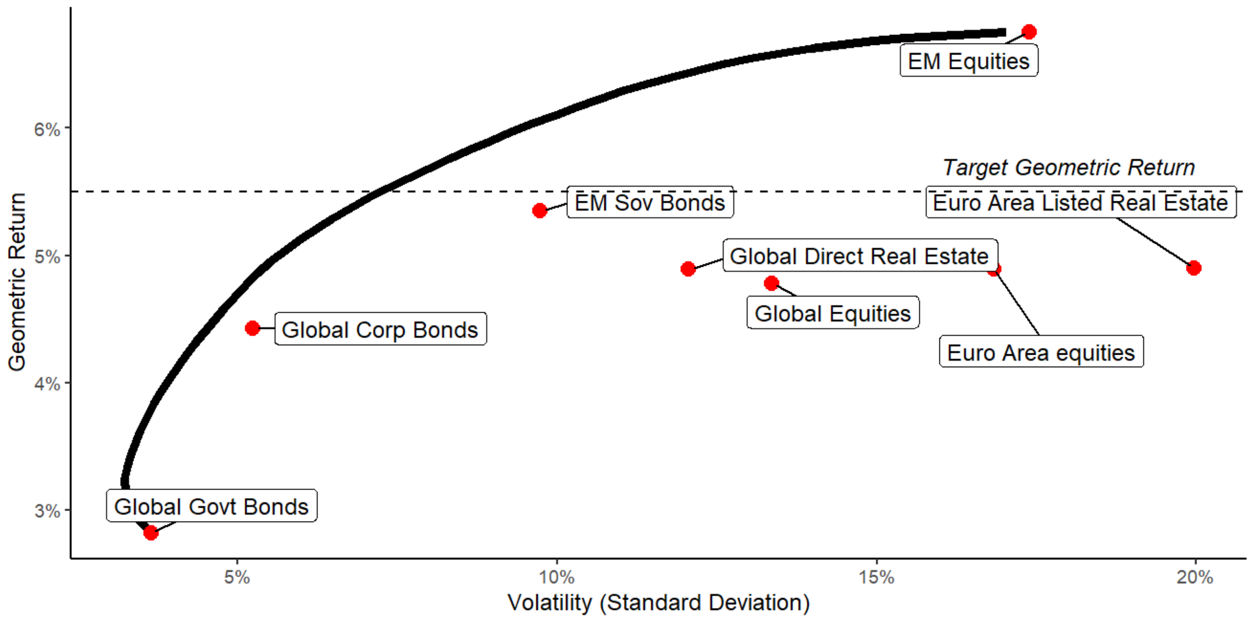
Source: Secretariat; data from Morningstar Direct for traditional asset classes, as of end-December 2023, using the longest common monthly return history (being 1 March 2005); in EUR.

Unlike the other asset classes shown above, alternative investments such as direct real estate have no underlying investible index. The return estimate for global direct real estate is an estimate of the industry average, net of manager fees, and compiled by J.P. Morgan Asset Management. Typically, for alternative asset classes and strategies, the dispersion of returns among managers is significantly wider than for traditional asset classes.

3.3. Construction of the strategic asset allocation

80. The optimal investment portfolio is created using the Markowitz modern portfolio theory, which combines pre-selected asset classes in such a way that the combined portfolio shows the lowest possible volatility for a given target return. In this way it is possible to define an "Efficient Frontier" which is the set of optimal portfolios that offer the lowest risk (volatility) for an expected return. The Efficient Frontier shown in Figure 2 below considers no constraints on allocation and can, in some cases, result in extreme allocations that are not reasonable to implement.

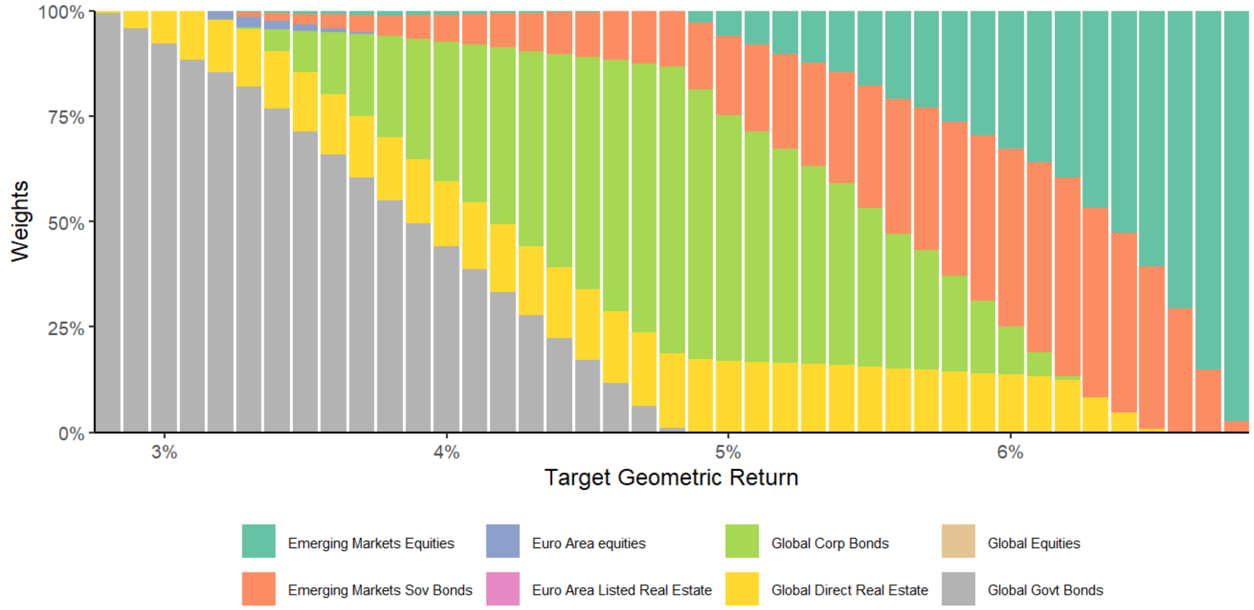
Figure 2: Unconstrained Efficient Frontier



Source: Secretariat

81. The weightings for each target return on the Efficient Frontier is shown in Figure 3 below.

Figure 3: Unconstrained Efficient Frontier – Portfolio weights by asset class



Source: Secretariat

82. Considering a target geometric return of 5.5%, the allocation with unconstrained optimisation would be:

Table 13: Unconstrained portfolio – 5.5% Geometric target return

Asset Class	Sub Asset Class		Weights
Equities	Global (Developed) Equities		0%
	Euro Area Equities		0%
	Emerging Markets Equities		17%
	Total Equities		17%
Fixed Income	Global Government Bonds (EUR Hedged)		0%
	Global Investment Grade Corporate Bonds (EUR Hedged)		39%
	Emerging Markets Sovereign Bonds – Hard Currency (EUR Hedged)		28%
	Total Fixed Income		67%
Alternatives	Euro Area Listed Real Estate		0%
	Global Direct Real Estate		16%
	Total Alternatives		16%
	Total Portfolio		100%
	Expected Return	Nominal Geometric	**5.5%**
		Real Geometric (2% inflation)	**3.4%**
	Volatility		**7.1%**

83. The initial result of the optimisation exercise without any constraints is extreme. There is little diversification with only four asset classes and 45% of the portfolio allocated to Emerging Markets. Therefore, the CAF decided to put limits to certain asset classes with the aim of creating better-balanced, feasible portfolios. Setting limits to the strategy is a common practice among pension funds for the purposes of liquidity, risk preferences,

availability of investments and fund regulations (related to country exclusions, for example). To set such limits, the financial target of the PRF, views on (and ability to take) risk, the size of the PRF, and the liquidity and availability of investment products have been considered. Finally, as it determines the ability for the PRF to be invested in risky and/or illiquid assets, the cash flow profile of the Fund has been considered when setting the limits.

84. Considering the cash flow profile and feasible portfolios, in order to make a well diversified portfolio, the following constraints were applied. These constraints have also been used in the creation of SAAs for other CAF Organisations:

a. Minimum of 5% per asset class, when the asset class is included, to ensure a sound implementation. This ensures sufficient resources are dedicated to the asset class and the allocation is non-trivial.

b. Minimum of 85% to core asset classes (Global Equities, Euro Area Equities, Global Government Bonds, Global Investment-grade Corporate Bonds and Euro Area Listed Real Estate).

c. Maximum of 15% to Emerging Markets (Emerging Markets Equities and Emerging Markets Sovereign Bonds)

d. Maximum of 5% to asset classes which have been most recently added to the investment universe – Global Direct Real Estate and Emerging Markets Sovereign Bonds

85. In addition to the above constraints, the CAF also considered the removal of Global Direct Real Estate from the investment universe for the PRF. Global Direct Real Estate is less liquid than other investments and if the PRF requires funds then inclusion of Global Direct Real Estate may increase the liquidity risk to the PRF[25].

86. Following investigation, it was not possible to find a suitable SAA that would meet all the constraints listed above and achieve the required return. However, by increasing the constraint relating to the maximum investment in Emerging Markets to 25%, from 15% and allowing a small reduction in the minimum constraint to core assets from 85% to 75%, it is possible to find an SAA that meets these constraints as shown in Table 14 below.

[25] Note that the CAF chose the UBS Global Real Estate Fund for the Global Direct Real Estate allocation. Following recent updates with the asset manager the Secretariat understands this fund has a long queue of redemption requests and therefore this asset class maybe be considered temporarily illiquid.

Table 14: Constrained portfolio – 5.5% Geometric target return

Asset Class	Sub Asset Class		Weights
Equities	Global (Developed) Equities		30%
	Euro Area Equities		22%
	Emerging Markets Equities		18%
	Total Equities		*70%*
Fixed Income	Global Government Bonds (EUR Hedged)		5%
	Global Investment Grade Corporate Bonds (EUR Hedged)		5%
	Emerging Markets Sovereign Bonds – Hard Currency (EUR Hedged)		5%
	Total Fixed Income		*15%*
Alternatives	Euro Area Listed Real Estate		15%
	Global Direct Real Estate		0%
	Total Alternatives		*15%*
	Total Portfolio		*100%*
	Expected Return	*Nominal Geometric*	***5.5%***
		Real Geometric (2% inflation)	***3.4%***
	Volatility		***12.7%***

87. Whilst the portfolio is diversified across asset classes, the large allocation to volatile asset classes significantly increases the volatility of the portfolio. The high volatility increases the vulnerability to liquidity risk for the PRF, particularly in 2028 when there is a risk of large benefit payments. The Secretariat believes this to be an aggressive strategy, not followed by any of the rest of CAF Organisations.

88. Considering the short-term liquidity risk faced by the PRF, a low volatility SAA has also been developed which could be implemented until 2028. After 2028 a new SAA could be implemented once the liquidity risk has reduced. The suggested SAA is shown in Table 15 below:

Table 15: Low volatility SAA

Asset Class	Sub Asset Class		Weights
Equities	Global (Developed) Equities		25%
	Euro Area Equities		10%
	Emerging Markets Equities		5%
	Total Equities		*40%*
Fixed Income	Global Government Bonds (EUR Hedged)		30%
	Global Investment Grade Corporate Bonds (EUR Hedged)		15%
	Emerging Markets Sovereign Bonds – Hard Currency (EUR Hedged)		5%
	Total Fixed Income		*50%*
Alternatives	Euro Area Listed Real Estate		10%
	Global Direct Real Estate		0%
	Total Alternatives		*10%*
	Total Portfolio		*100%*
	Expected Return	*Nominal Geometric*	*4.7%*
		Real Geometric (2% inflation)	*2.6%*
	Volatility		*8.0%*

89. Compared to the previous SAA shown in Table 14, this SAA provides an approximate 5% reduction in volatility and a more balanced SAA with greater diversification amongst and within asset classes. Although this SAA does not meet the required target return of 5.5%, it does mitigate the short-term liquidity risk faced by the PRF. It is anticipated that, in 2029, a new SAA could be implemented to ensure that the required return is met in the long term based on a subsequent cashflow review and update in the asset return assumptions.

90. Table 16 below shows the SAAs presented here as well as the SAAs currently implemented by other CAF Organisations for information. The returns and volatility of each SAA is based on the most recent estimations as set out in Section 3.2.

Table 16: Summary of SAAs

	Name		Unconstrained	SAA 1	SAA 2	CAF 1	CAF 2
	Objective		5.5% Target with no constraints	Target-Focussed	Low Risk-Focussed		
Asset Class	Sub Asset Class		Weights	Weights	Weights	Weights	Weights
Equities	Global (Developed) Equities		0%	30%	25%	35%	22%
	Euro Area Equities		0%	22%	10%	10%	13%
	Emerging Markets Equities		17%	18%	5%	10%	5%
	Total Equities		17%	*70%*	*40%*	55%	40%
Fixed Income	Global Government Bonds (EUR Hedged)		0%	5%	30%	15%	31%
	Global Investment Grade Corporate Bonds (EUR Hedged)		39%	5%	15%	10%	14%
	Emerging Markets Sovereign Bonds – Hard Currency (EUR Hedged)		28%	5%	5%	5%	5%
	Total Fixed Income		67%	*15%*	*50%*	30%	50%
Alternatives	Euro Area Listed Real Estate		0%	15%	10%	10%	5%
	Global Direct Real Estate		16%	0%	0%	5%	5%
	Total Alternatives		16%	*15%*	*10%*	15%	10%
	Total Portfolio		100%	*100%*	*100%*	100%	100%
	Expected Return	*Nominal Geometric*	***5.5%***	***5.5%***	***4.7%***	***5.1%***	***4.6%***
		Real Geometric (2% inflation)	***3.4%***	***3.4%***	***2.6%***	***3.0%***	***2.6%***
	Volatility		***7.1%***	***12.7%***	***8.0%***	***10.0%***	***7.5%***

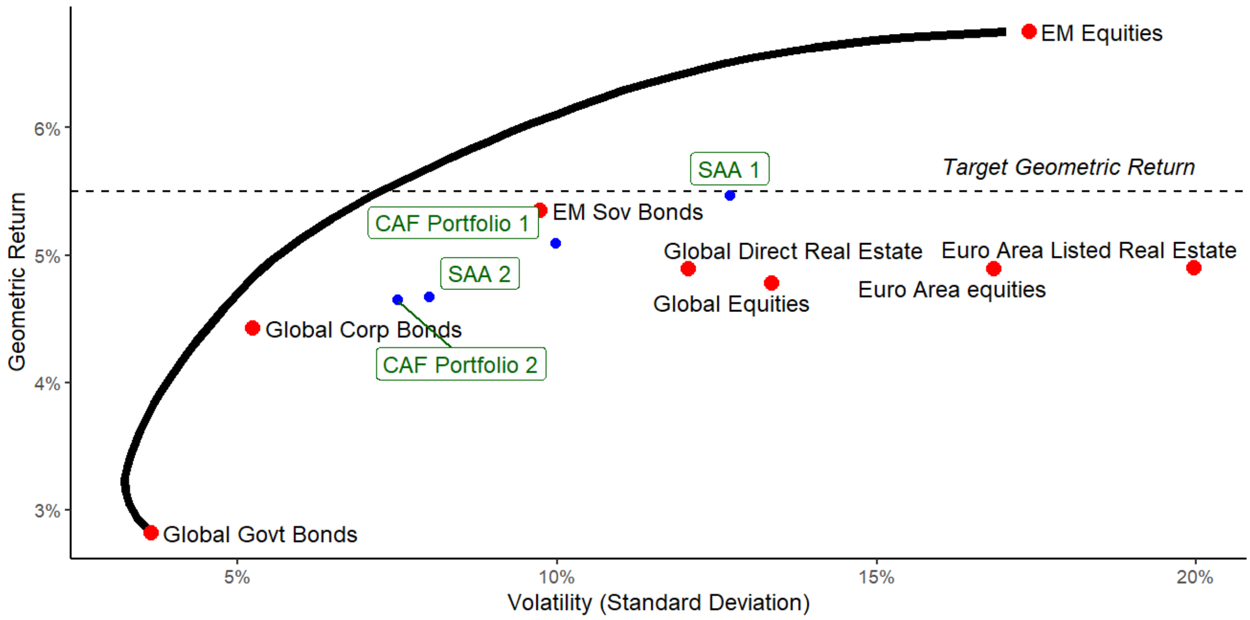
(1) “CAF 1” SAA has been implemented by the PRFs of EUISS, HCCH and EU SatCen.

(2) “CAF 2” SAA has been implemented by RATU’s SUF.

(3) Real return is calculated using a 2% inflation assumption geometrically applied to the nominal (unrounded) return, after which the calculation is rounded to one decimal place. Due to rounding, the table shows a 0.1% difference in the nominal geometric return between SAA 2 and CAF 2 even though the expected return is different.

91. Figure 4 below represents the positions of the suggested SAAs, the efficient frontier and the position of the assets used in the optimisation process.

Figure 4: Efficient frontier – CAF Universe with SAA options



Source: Secretariat

92. As an alternative to SAA 1, which has an expected return equivalent to the required return, or SAA 2, which has low volatility to mitigate liquidity risk, the SAA implemented for other CAF Organisations – in particular CAF 1 in Table 16 – could also be considered. Whilst not achieving the required return, it would provide a higher return than SAA 1 for a reasonable risk and has previously been recommended for adoption by the CAF.

PRF Risk Considerations

93. The CAF also considered the short- and long-term risks associated with the considered SAAs. The CAF considered the risks associated with the SAA options shown in Table 17.

Table 17: Investment strategy options

Option	SAA	Geometric Return	Volatility	Considerations
Target-focussed	SAA 1	5.5%	12.7%	Achieves target return from implementation. May have higher short-term risks based on events
Low Risk-focussed (1)	SAA 2 implemented for 2025-2028. It is then assumed that CAF 1 SAA is implemented from 2029 onwards.	4.7% (2025-8) thereafter 5.1%	8.0% (2025-8) thereafter 10.0%	Lower-risk portfolio implemented until liquidity risk is diminished (2029). Portfolio would be adjusted in 2029 to seek a long-term required return over the full horizon period.
CAF 1	CAF 1	5.1%	10.0%	Reasonable risk-return profile implemented by other CAF Organisations.

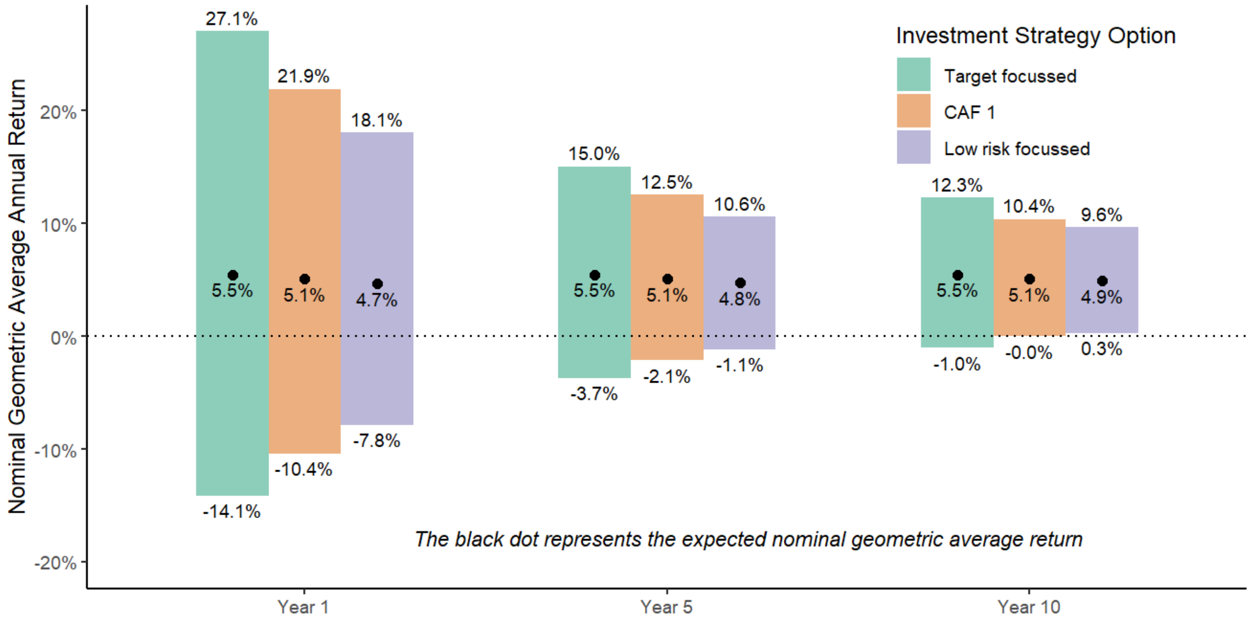
Notes: (1) The SAA to be implemented in 2029 is not currently fixed and would be re-assessed following a further PRF review.

Short-term Risks

94. Over the short term, the PRF faces the risk that investment returns are significantly below expectations. These risks are predominantly due to market risk, whilst it is necessary to adopt some level of market risk to obtain investment returns, this must be in-line with UNIDROIT's risk appetite. Based on the investment strategy options, the potential dispersion of returns over the short term can be examined. The dispersion of average returns expected from SAA options is shown in Figure 5. It shows the 90% confidence intervals (i.e. returns are expected to be within this range 90% of the time) of average annual returns over 1, 5 and 10 years for each investment strategy option, based on the stochastic simulation of returns[26].

[26] The stochastic simulations involve projecting investment returns, based on a chosen mean return and volatility, over an 80-year projection horizon. The stochastic analysis looks at 10 000 simulations to consider the risks to the PRF of different investment returns.

Figure 5: 90% confidence intervals of nominal geometric average returns after 1, 5, 10 years by investment strategy option



Source: Secretariat

95. The target-focussed option poses the most downside risk over the short term. Over one year, the worst 5% of sampled returns in the target-focussed option show a -14.1% investment return, compared to a -7.8% investment annual loss with the low-risk focused option and a -10.4% investment loss with the CAF 1 option.

96. The lower volatility of the low risk-focussed option reduces the downside risk of the portfolio across all investment horizons shown in Figure 5. However, as the horizon is increased, the differences between the three options become smaller.

Long-Term Risks

97. Over the long term, the PRF is exposed to a wider range of risks than just market risk. To capture the risks, it is possible to examine the development of the Fund over time, by incorporating the projected cashflows along with the stochastically projected investment returns to show the potential development of the PRF.

98. To examine the risks to the PRF, the CAF considered the long-term outlook for the PRF using projected cashflows under two scenarios:

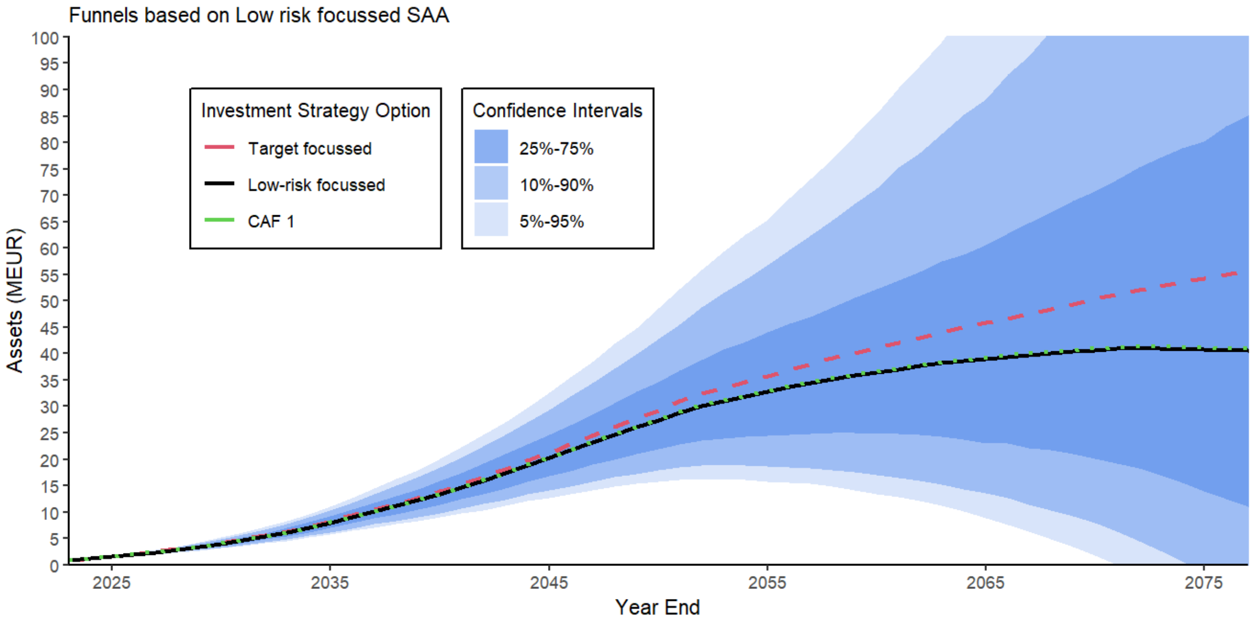
a. Base Case scenario – these are the base case projections presented in the actuarial projections adjusted to include all expenses related to the ongoing operations of the PRF.

b. Sensitivity scenario – this incorporates a "benefits shock" in 2028 when a large benefit payment of EUR 500 000 could be possible. Such a benefit payment would be financed from the PRF, and it is assumed to occur at the start of the year.

Base Case Cashflows

99. The development of the PRF in the long term can be considered with the use of stochastic projections[27] applied to each investment strategy option as shown in Figure 6 below.

Figure 6: PRF development with base case cashflows



Source: Secretariat

100. Over the long term, all investment strategies produce a long-term viable solution. The low risk-focussed option and the CAF 1 SAA produce a very similar outcome. This is due to the two options having the same SAA from 2029 onwards.

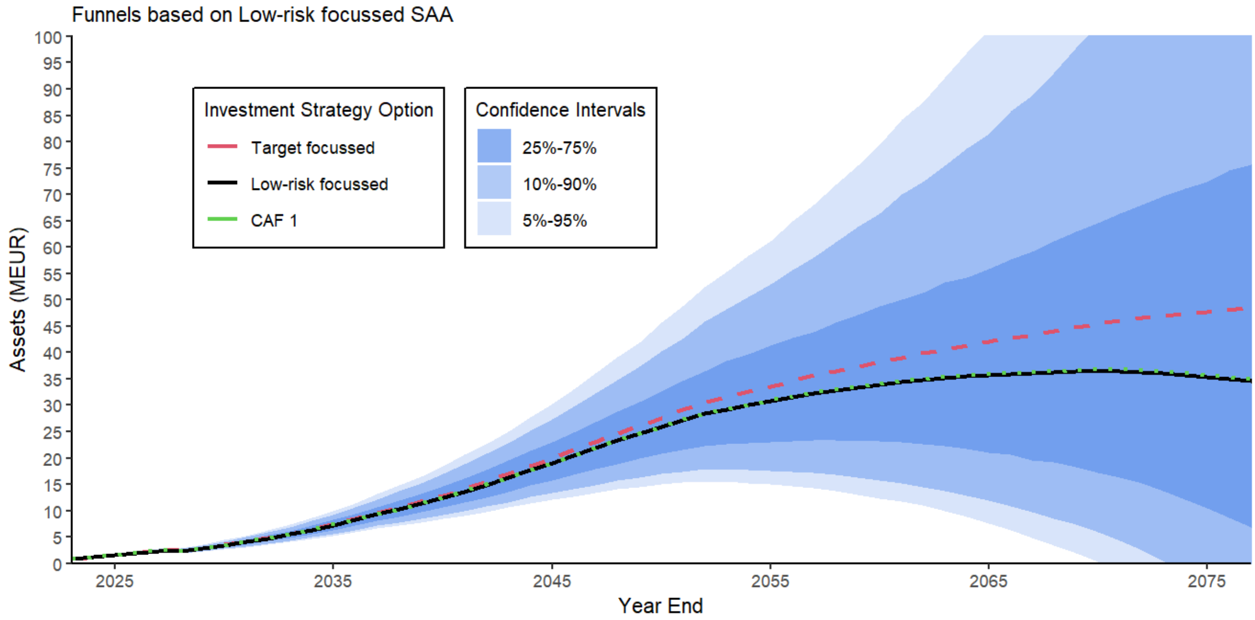
101. Whilst the stochastic projections show some possibility of depletion, it should be noted that this is approximately 45 years in the future. Furthermore, future reviews and re-evaluation of risks and the investment strategy should mitigate the possibility of any significant deviations from the PRF's expected development and impact on the PRF's long-term viability.

Sensitivity Scenario Cashflows

102. The development of the PRF can also be considered using the sensitivity cashflows which incorporate a large benefit payment being made in 2028 and assuming the entire benefit is funded from the PRF at the start of 2028. This is shown in Figure 7 below.

[27] Stochastic projections use 10 000 simulations of investment returns based on the return and volatility profile of each investment strategy option. The PRF development is then calculated for each simulation after which the probability of outcomes can be calculated based on the 10 000 development simulations.

Figure 7: PRF development with sensitivity cashflows

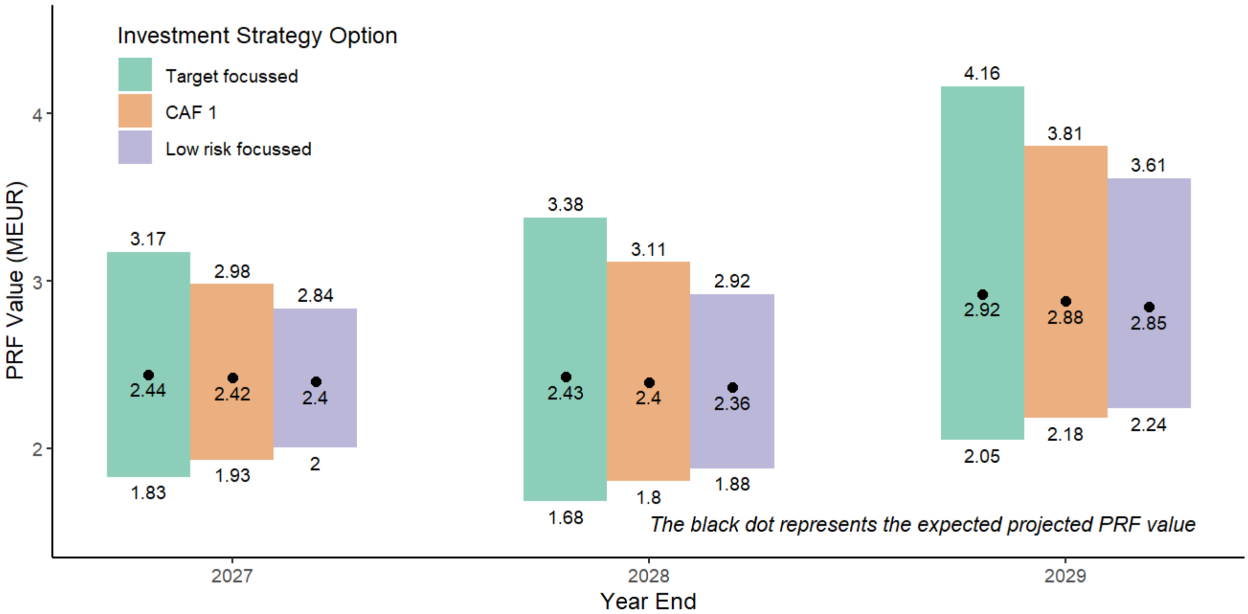


Source: Secretariat

103. Over the long term, all investment strategies produce a long-term viable solution. However, by the end of the horizon in 2077 there is approximately a EUR 8 million difference in the development of the PRF in the Sensitivity scenario compared to the Base case cashflows.

104. To gauge the impact of the large benefit payment in 2028 by investment strategy, it is possible to consider the confidence intervals of the PRF in the years 2027 to 2029 as shown in Figure 8 below.

Figure 8: 90% confidence intervals of the projected PRF value in 2027 to 2029 by investment strategy option



Source: Secretariat

105. Comparing the lower bound of the confidence intervals (i.e. the least favourable development of the PRF under each investment strategy option) for the target-focussed and low risk-focussed investment strategy options, the impact of a "benefits shock" in 2028 is more pronounced in the target-focussed option. The smaller dispersion of values, represented by smaller bars, in the low risk-focussed option is due to the lower volatility of this investment strategy option.

<u>Conclusion on Investment Strategy Options</u>

106. In conclusion, all investment strategy options could be considered long-term viable, showing little depletion risk for the next 50 years, aided by the expected net cash inflow to the PRF until 2052.

107. Given the small population of UNIDROIT staff affiliated to the pension scheme and the small size of the PRF there exists significant liquidity risk to the PRF from staff changes which could result in large benefit payments being made at an inopportune moment. The low risk-focussed investment strategy shows lower investment return dispersion and potentially better positioned to mitigate the impact of a large, simulated benefit payment in 2028, related to the end of the Secretary General's contract. On the other hand, only the target-focussed investment strategy will meet the required return over the long term. The CAF 1 investment strategy may provide a middle-ground – providing some risk mitigation through lower volatility, to provide better mitigation against liquidity risk compared to the target-focussed investment strategy, but still being well-diversified and balanced to provide higher investment returns than the low risk-focussed investment strategy.

4. CAF Recommendation

108. The CAF is invited to consider this report and make a recommendation to UNIDROIT's Secretary General to be approved by UNIDROIT's General Assembly on which investment strategy to implement. The CAF recommendations for decision and suitable risk appetite statements for the PRF, as well as a risk tolerance statement, to be accepted by the General Assembly are set out below:

Option (a):

Target-focussed investment strategy with a 5.5% expected return and expected volatility of 12.7%.

Risk appetite statement: "*The General Assembly approves the implementation of an aggressive strategic asset allocation with an expected long-term target return of 5.5% and expected volatility of 12.7% so the expected cashflows between projected years 76 to 80 offset each other. This is understood as a long-term viable situation. The General Assembly accepts the potential liquidity risk arising from the turnover of key personnel and the high volatility of the SAA in order to reach a higher return than other less volatile strategies.*"

Option (b):

Low risk investment strategy with a 4.7% expected return and expected volatility of 8.0% to be implemented until 2028 (inclusive).

Risk appetite statement: "*The General Assembly approves the implementation of a strategic asset allocation with an expected long-term target return of 4.7% and expected volatility of 8.0%. Whilst the strategic asset allocation is lower than the required return of 5.5%, it provides suitable liquidity risk mitigation via a relatively low level of volatility. A new strategic asset allocation may be implemented in the future once the liquidity risk has diminished.*"

Option (c):

Implementation of the SAA already used by other CAF Organisations with a 5.1% expected return and expected volatility of 10.0%.

Risk appetite statement: "*The General Assembly approves the implementation of a strategic asset allocation with an expected long-term target return of 5.1% and expected volatility of 10.0%. Whilst the strategic asset allocation is lower than the required return of 5.5%, it provides suitable diversification for the PRF's assets with an acceptable level of volatility for the long term. The General Assembly accepts the potential liquidity risk arising from the turnover of key personnel, in order to reach a higher return than other less volatile strategies.*"

Risk tolerance statement: "*The CAF regularly reviews the investment performance of the PRF to ensure that returns are evolving in-line with the strategic asset allocation. In the event that returns are not consistent with the objective of the PRF, this would be raised to the General Assembly for consideration and potential action. It is understood that there will be short-term volatility in the investment returns which may result in assets being sold from the PRF to meet benefit obligations and any response should be consistent with the long-term objective*."

Annex A. Actuarial Assumptions

1. Actuarial assumptions are classified into financial and demographic categories. Financial assumptions influence the amount and net present value of benefits to be paid overtime. Demographic assumptions reflect the likelihood of payment and factors specific to UNIDROIT.

Table 18: Selected Significant Actuarial Data and Assumptions for Cash Flow Projections

Data	Description	Value
Population evolution		24 actives (12 in UNIDROIT pensions scheme & 12 affiliated to Italian system) (at 31 July 2024)
Fund Value	Net Asset Value of the PRF	EUR 1.1 million (at 31 July 2024)
Assumption	**Description**	**Updated Assumption**
Financial Assumptions		
Price Inflation	Annual increase of inflation. Impacts rate of increase of pensions in payment and salaries.	1.80%
Salary Inflation	Increase in annual salary scales over and above price inflation	0.00%
Demographic Assumptions		
Mortality Table	Probabilities of death at different ages	ICSLT 2023
Contribution Assumptions		
Staff Contribution Rate	Rate of contributions paid by staff participating in the UNIDROIT pension scheme on their basic salary	16.7%
Organisation Contribution Rate	Rate of contributions paid by UNIDROIT on the basic salary of staff participating in the UNIDROIT pension scheme	20.3%