Investment Governance Case Studies: SSO investment training course

CASE STUDY 3

Individual Guidelines Covered

This interactive case study addresses Guidelines 7, 11 and 12 contained in Section C. *Common Processes*

C. Common Processes

This part of the guidelines refers to the processes that the investing institution must put into place to meet governance requirements and ultimately meet its investment objectives. These processes apply whether the investment itself is carried out by an internal investment unit or an external manager.

These processes should be considered after the principles regarding investment (Part A) and structure (Part B) have been determined. Although the guidelines in this part apply to a differing extent, depending on the nature of the social security reserve fund and its liabilities, size and other characteristics, it is expected that all these guidelines should be considered by social security institutions in the investment of their reserve funds.

Guideline 7 - Defining the risk budget

The investment process is framed by reference to a risk budget aligned to the investment.

A risk budget is the amount of investment risk, relative to liabilities, an investing institution wishes to take. Risk budgeting is a risk modelling tool (similar to asset liability modelling) which aims to define the risk budget and allocate it among different investments in the most efficient manner. Risk budgeting typically has a shorter outlook than asset liability modelling, and can also assess how to allocate the risk budget among different types of investment management, as well as different asset classes.

Investing institutions operate in global financial markets where the management of risk and uncertainty is crucial to the creation of long-term value. Risk-taking against well-defined objectives is an essential ingredient in any well-governed financial institution. The extent to which risk-taking is a deliberate and managed activity depends upon the governance budget allocated to this function within the institution.

The risk budget concept recognizes that asset owners are required to take risks to aim to achieve the desired return outcomes. Risk budgeting provides a quantitative framework for determining how much risk needs to be taken to achieve the return objectives, what the expected reward is for each unit of risk, and the relative attractiveness of different investment opportunities and initiatives, asset classes and managers.

Once a risk budget is defined, it will be used to formulate a strategic asset allocation (as outlined in Guideline 11, Risk budget analysis and utilization) and to formulate a dynamic asset allocation reflecting extreme market valuations (covered in Guideline 12, Dynamic investing)

Guideline 11 - Risk budget analysis and utilization

Risk budget analysis is conducted to better understand the level of investment risk being taken and how it could be managed, and to determine an appropriate strategic asset allocation considering the risk budget established (as covered in Guideline 7).

Spending the risk budget enables the investing institution to determine an appropriate strategic asset allocation considering the available risk budget, investment assumptions, restrictions on investments and liabilities, and funding policy.

The use of the risk budget as outlined here should be distinguished from dynamic investing (Guideline 12). For example, dynamic investing may lead to a decision to purchase equities based on a view that their price is currently advantageous; such a decision may be at odds with a long-term view to reduce equity exposure due to

a maturing of liabilities. These decisions should be taken in consideration of strategies to rebalance risk levels (covered in Guideline 13).

Guideline 12 - Dynamic investing

As asset market values change over time, the investing institution is able to exploit variations in market valuations by investing differently than in the strategic asset allocation, while respecting the risk budget established in Guideline 7.

This process of dynamic investment (sometimes referred to as tactical investment) will be limited in time but the maintenance of such a position, which may diverge from the strategic asset allocation, may subsist in the medium term.

Background

Below, there are two fictional social security provision frameworks – the first in Strackland, the second in Dinaterra. Participants are encouraged to select the one most relevant to their learning objectives. These examples are used throughout the case studies as a basis for discussion. In some situations, the principles and approaches will be similar; in others (for example related to liabilities) the investment governance implications will be significantly different.

The remainder of the case study content is applicable to both frameworks (unless otherwise stated).

Social security in Strackland

1. The social security system in Strackland provides a range of compulsory retirement benefits to formal sector workers in the country. The benefits are determined as follows:

- A flat rate retirement income paid if the member contributes to the system for at least 30 years

- A variable rate element which depends on years of contributory service (1% of capped salary for each year of service)

Dependants' benefits are also provided on death of the pensioner.

Benefits are financed by a contribution of 10% of total salary for employers and 8% for employees. This contribution rate has remained unchanged since 2006. Retirement age is 62 but there are proposals to increase this to age 65. Early retirement is possible from age 60 on relatively generous terms (i.e. not actuarially cost neutral). There is voluntary membership for the self-employed.

Long-term financing projections have been made and recognise the need for direct government financial transfers in the future if contribution rates and benefits remain unchanged.

Social security in Dinaterra

2. In Dinaterra, social security is provided through a Provident Fund financed by employee contributions of 5% and employer contributions of 7%. The fund provides a lump sum at retirement age and guarantees interest of 7% per annum on account balances. Fund account balances are credited with interest every 1 January.

Whilst normal retirement age is 60, account holders are allowed to withdraw money earlier for approved health, education or housing needs. The maximum withdrawal is a percentage of account balance; this percentage amount varies with age.

The Fund was established 25 years ago, aiming "to provide its membership with their benefits, balancing risk and return to achieve performance in the top quartile of its peer group". The peer group is considered as any social security fund of a comparable benefit structure. For Strackland, some partially funded defined benefit pension funds are also appropriate peers, whereas in Dinaterra some foundations and absolute return funds with similar risk tolerances are appropriate peers. Even where the peer group appears quite diverse, many underlying principles and beliefs are comparable.

Having established the mission and objectives (see case study 1) of the Fund, the next step in arriving at its investment portfolio was to create a risk budget framework. Within this framework, the Fund looked at 'risk need' and 'risk tolerance'. In order to achieve the return objectives set out, the Fund calculated an approximate allocation to equities and bonds based on historic return assumptions. This resulted in a 'risk need' calculation, based on the historic volatility of those returns over the previous 20 years. This 'risk need' was quantified in terms of one-year Value at Risk (VaR) and one-year standard deviation of returns. It was decided that the 'risk tolerance' limit should be set at this point, and therefore that any resultant portfolio could not exceed this level of risk.

Given the governance limitations of the Fund when established (see case study 2), it was felt that dynamic asset allocation should not be implemented. The Fund instead chose to rebalance the portfolio to its strategic weights on 31 December each year at an asset class level. In practice this meant that if the initial allocation of 15% to domestic equities had increased in value during the year to 16% of the portfolio at 31 December and the allocation to domestic bonds had decreased from 30% to 29%, then a rebalancing was carried out, taking 1% from the domestic equities allocation to the domestic bond allocation.

Over time, the asset allocations have developed and the current portfolio is set out below:

Asset class	**%**
Equities – domestic	*15*
Equities – global	*30*
Domestic bonds	*30*
Global investment grade credit	*12*
Property – domestic	*5*
Hedge funds	*5*
Cash	*3*
Total	***100***

Note – this portfolio applies to both the Strackland and Dinaterra frameworks. This is intended not to be a model to follow, but an example of a possible portfolio with room for significant improvement.

Extract from beliefs statement:

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3. The Board will develop a risk management framework and risk budget for the Fund, with asset allocation and strategy set relative to this

4. Returns relative to liabilities should be maximised, subject to a given risk budget

8. Rebalancing between asset classes is important to ensure that risk remains in line with pre-agreed tolerances

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Areas for discussion

The questions and discussion points below are intended to direct the case study debate. They comment on:

- Risk budgeting and analysis (points 1 – 4)
- Dynamic asset allocation (points 5 – 11)

Case study discussion, however, does not necessarily have to be limited to these questions, and wider considerations and ideas are encouraged. In addition, the references and good practices supporting the guidelines also provide examples and resources to contribute towards debate.

Risk budgeting and analysis

1. How could the risk-return framework described above be improved? What additional considerations could be applied?
2. What are the key details of each element of this framework?
3. How should risk and return assumptions be set? Is historical data sufficient?
4. How does the real world compare to theory in terms of assumptions?

Dynamic asset allocation

5. Is the current portfolio rebalancing reasonable? What are its key benefits?
6. How should dynamic asset allocation be defined, and what should be included in its scope?
7. How does dynamic asset allocation differ from strategic asset allocation and tactical asset allocation?
8. What is an appropriate rationale for using dynamic asset allocation?
9. What beliefs are required to be held for dynamic asset allocation to be implemented effectively?
10. What (beside the beliefs mentioned above) is needed to ensure that the dynamic asset allocation strategy is carried out effectively?
11. What are the principal risks associated with dynamic asset allocation?

RISK BUDGETING AND ANALYSIS

1. Establishing a risk-return framework helps the Fund consider the pay off between risk and return and create a risk-return habitat. In addition to the two key areas of 'risk need' and 'risk tolerance' present above, this could be extended with 'risk attractiveness' and 'risk governance'. More detail on each of these elements is set out in question 2 below. Further, the measures of risk chosen by the Fund (one-year Value at Risk and one-year standard deviation) could be improved. Firstly, a longer time horizon could be considered as well as the one-year measures (see Case Study 4). This could be a percentage deviation from the return target over a ten-year period for example, to give a measure of the range of likely long-term outcomes. Secondly, risks could be considered on a scenario basis – for example considering what could happen in certain economic situations such as regional deflation, or more extreme situations such as an oil price shock or a financial crisis similar to 2007-8.

2. An example risk framework is shown in the diagram below:

Risk need

Given a certain level of required return, the central principal is that risk should be minimised.

The Fund (in Strackland) has liabilities that must be met from a combination of cash contributions and investment returns. If liabilities and contributions are fixed, then the required minimum level of investment return (and therefore risk) can be established. The Fund in Dinaterra has a fixed investment return (and therefore risk) target without any liability and contribution calculation.

Risk tolerance

Volatility is a risk measure used by investment professionals to measure short-term movements in prices. This is very different from permanent capital loss. As a long-term investor, the Fund should primarily be concerned with the risk of permanent capital loss and look through any short-term volatility. For investors with longer-term horizons, volatility only leads to losses if a) they react unnecessarily to short-term market movements or b) they exhaust their risk tolerance. Sticking to the strategic plan is achieved through good risk governance (see below).

Risk buffers are practical methods of offsetting volatility. These could include investing for longer, taking more risk if an asset's price falls, saving more, building in margins, or taking out insurance against loss.

There will be some 'extreme risks' to which investors are always exposed. Investors should consider their exposure to 'extreme risks' and whether they wish to hedge, retain or even increase exposure to them. If investors build in buffers for every possible event, they take no risk at all and consequently receive no return.

Risk attractiveness

Determining the optimal mix of assets is fine, but an assessment of current valuations is essential. This may sound obvious, but many investors buy market risk at the wrong time. There are times when taking significant risk is well-rewarded (March 2003 and March 2009) and times when it is not (1973, the end of 1999 and the summer of 2007). Thought about differently, these periods where risk is not well-rewarded, offer opportunities to invest in less risky assets. In general, risk is attractive when other investors are risk-averse and vice versa.

Risk governance

Ensuring that all the decisions made about the risks being taken are well-informed and well-implemented requires a strong risk governance framework. Investors with such a framework are better placed to take logical decisions when faced with worse than expected outcomes. Conversely, poor risk governance can lead to lower realised returns. More sophisticated investors often have the resources and the experience to implement high quality risk governance. This could include:

- Being clear over the Fund's mission and objectives
- Effective resourcing
- Strong beliefs that are aligned with goals and inform all decision making
- A well-defined risk budget
- Be competitively positioned relative to other market investors
- Make decisions in real-time, not in pre-determined calendar-time (e.g. quarterly meetings)
- Measure and manage a wide range of risks, aware of the limitations of purely quantitative or purely qualitative measurement

3. When setting assumptions, the Fund is looking to project possible risks and returns in the future. History alone will give some indications about possible future events, but it can often be quite a poor predictor of what will happen next. In general, history is more accurate when predicting risks than returns, although it is very difficult, if not impossible, to predict more extreme or unusual risks.

An effective assumptions-setting process for asset classes and strategies is likely to rely more on informed judgement than just quantitative models. There is no single methodology or approach that is completely right, and there are a great number of approaches that can provide appropriate return assumptions. Therefore, the outcome of the assumptions-setting process should be expressed as a range of assumptions. A sensible view could be to look at three main pillars to an assumptions-setting process:

Theory

This is likely the starting place, even though theory may not always match reality (see below). We need to understand, at a given moment in time, the fundamental structure of markets and the rationale for existence of risk premia (why investors get rewarded for investing in certain assets). For this, we cannot ignore economic theories about currencies, interest rates and so on. Although individuals should form their own views, the body of opinion that has been created by academics and investment professionals over decades should be considered as appropriate. Moreover, it is reasonable to extrapolate from theories, combine theories and develop own versions of theories.

History

It is important to be good investment historians, which means not looking at historical returns without analysing and questioning them. To identify the likelihood of an asset outperforming requires an understanding of drivers of returns and their sustainability. In practice, it may mean focusing on very long time spans – over ten years and perhaps over several decades depending on the asset class. Equally, while many investors focus on US and mature market assets, it should be remembered that other countries have not enjoyed such long periods of prosperity and power. Global dynamics can change relatively quickly and we cannot assume the future will look like the past.

Economic conditions

Ascertaining whether the economy is in a low-growth, high-risk phase or vice versa should inform our opinion of asset classes. Part of this analysis could be derived from market pricing and surveys of managers. Investors could look for patterns and anomalies for example.

4. The real world versus theory

In practice, no matter how much time and effort is taken in creating assumptions about asset classes, the reality rarely matches up. Investors tend to model single asset classes against the behaviour of a single rational investor. In reality we cannot extrapolate from a single individual's actions to predict the behaviour of the market as a whole – partly because we can never accurately describe the initial conditions and partly because we cannot model all the interactions between all market participants. Even if we had a comprehensive mathematical model for all the interactions, we still could not predict outcomes since if market participants knew how the market worked, they would behave differently. Behavioural economics partially addresses these issues but has not generated an approach which fully captures the complexity and interconnectivity of financial markets.

Given this, investors must realise and accept the limitations of models. Models are good at answering questions of 'how much', but not so good at providing 'yes' or 'no' answers to complex questions. Sometimes there is too much belief in the power of models – possibly because the builders of models have a vested interest in demonstrating their worth to others.

As a result, we have to complement models which reflect "normal" market conditions with scenarios that describe low-probability outcomes such as a 50% fall in equities or a collapse in developed market commercial real estate values. A good approach is to stress test the risk-return models, shocking the assumptions either individually (shock analysis) or jointly (scenario analysis) to understand the key drivers of risk. An additional approach is to reverse stress-test the assumptions to identify events that may create huge damage to a portfolio, however implausible they may be.

DYNAMIC ASSET ALLOCATION

5. It is important to rebalance the portfolio in order for the actual investments to remain in line with the strategic allocations and objectives. The frequency of rebalancing should be considered against the costs associated with rebalancing, especially transaction costs. Appropriate time scales for rebalancing at a portfolio level may be as often as quarterly, and as infrequent as annually. The benefits of this kind of rebalancing extend beyond the alignment with strategic allocations and objectives. One further key benefit is that rebalancing will mean that assets that have performed relatively well and become relatively more expensive will be sold, and assets that have performed relatively badly and become relatively cheap will be bought. This fits in with the general investor ambition of "sell high, buy low" which is likely to add some value over time.

6. There are a number of definitions of dynamic asset allocation (DAA). A sensible option could be "a process that seeks to adjust an investor's asset allocation in response to significant mispricing in asset classes in the expectation that reversion to fair value is likely over the medium term (e.g. three to five years)".

There are a number of factors that should be considered as part of the DAA definition:

- The timeframe over which decisions are expected to add value (however 'add value' is defined)
- The timeframe and process with which the decisions are made
- The degree of conviction required to take a dynamic position
- The extent to which there remains a strategic asset allocation or policy benchmark

The way in which an investor's definition of DAA addresses the issues above will help to define the mission or objective of an investor's DAA process.

7. DAA can be utilised alongside other asset allocation approaches as part of an investment strategy which could be defined as per the table below. Again, there are a number of possible definitions, but some reasonable ones are shown here:

	Strategic Asset Allocation (SAA)	Dynamic Asset Allocation (DAA)	Medium Term Opportunities (MOPs)	Tactical Asset Allocation (TAA)
Primary purpose	Deliver return consistent with risk profile	Add incremental return or reduce risk	Add incremental return and diversity	Add incremental return or reduce risk
Timeframe	Long Term	3+ years	3+ years	Months
Breadth	Generally extends to all asset classes	Liquid asset classes	All asset classes, but niche focus	Liquid assets only Can often use 'short' positions/derivatives
Focus	Risk, return, liability profile, cashflow and funding requirements	Risk, return, liability profile, cashflow and funding requirements	Risk and return	Return

8. There are a range of motivations for pursuing a Dynamic Asset Allocation (DAA) approach. These could include:

- Adding incremental returns relative to a static strategic asset allocation
- Adjusting the level of risk taken in response to changes in the reward per unit of risk
- Replacement for the traditional strategic asset allocation
- Providing downside protection in extreme market downturns
- Outperformance of peers

9. There are a number of beliefs required in order to justify adopting a Dynamic Asset Allocation (DAA) approach. These include:

- Markets occasionally become meaningfully over/undervalued, from these levels a return to 'fair value' will then occur over the medium-term (three to five years)
- It is possible for an investor to identify, with a high degree of confidence, those times at which markets are meaningfully over/undervalued
- After transaction costs, a process that takes positions based on material misalignments between fundamental value and market pricing can add value on a risk-adjusted basis
- DAA positions should be sized so as to have a worthwhile impact on total portfolio outcomes
- A DAA process can produce a return stream that has a moderate to low correlation with the existing market and active manager exposures within the portfolio
- It also needs to be understood that a DAA process can result in significant underperformance (relative to the SAA) over the short to medium term, before the return to 'fair value' takes place

10. There are a variety of factors here, which include:

Broad opportunity set

A process/strategy that has a broader opportunity set should have greater potential to generate excess returns than a process/strategy with a narrow focus. Therefore it is important to have a sufficiently broad set of potential decisions so as to reduce the reliance of the DAA process on the success of a few highly concentrated "bets"

Analytical framework overlaid with judgment

It would be sensible that at the core of a DAA process should be a quantitative framework for assessing the 'fair value' of the various asset classes that are in the portfolio that can be both theoretically and empirically justified.

In referring to the framework as quantitative, there will clearly be qualitative inputs relating to the central economic forecast that drives the outlook for key variables such as interest rates and inflation, and also a judgmental overlay applied when interpreting the output from the various models used.

Breadth of inputs

In assessing the fundamental value of a particular asset class, there are a number of both absolute and relative value analytics that could be used. It is not unusual for different analytics to provide different signals (particularly for currencies) or for there to be several reasonable interpretations of a given metric or combination of metrics. Therefore it is important that investors implementing a DAA process consider a wide range of inputs and opinions, and in particular consider plausible scenarios/views that differ from their own central forecasts.

Robust and disciplined decision making framework

In making a DAA decision, an investor is in fact making a number of decisions simultaneously:

- All decisions are relative, therefore when deciding to overweight one asset class it is necessary to underweight another asset class or classes
- In addition, having decided on an entry point to a particular position, it is also important to decide in advance the pricing levels at which consideration will be given to exiting the position
- Finally, it is also important to establish a framework around actions to be taken when a market pricing moves significantly against the position (e.g. increase position size vs. activating a stop loss)

It is therefore critical that an investor has a robust, disciplined decision making framework that considers the issues set out above. In addition, whilst DAA decisions are medium-term in nature, market pricing can move quickly and therefore an investor's decision making process does need to operate in "real time", even when no DAA positions are in place.

A medium-term timeframe is critical

Over short timeframes, market movements are subject to significant amounts of "noise" – therefore attempting to consistently generate value from decisions based on fundamental value over such timeframes will be more dependent on luck than insight/skill. Also, it is almost inevitably the case that when using fundamental value as the basis for DAA decisions, an investor will be "too early" and pricing will become more extreme before a return to 'fair value' occurs. An investor therefore needs to have a medium-term timeframe for assessing success/failure and the conviction to continue to hold a loss-making position, as long as the analytical framework continues to demonstrate that a particular asset class is significantly over/under valued.

Appropriate governance structure

Associated with a real time decision making process and a medium-term timeframe is an investor's governance structure. It is essential in adopting a DAA process that an investor's internal governance enables DAA decisions, once made, to be efficiently implemented.

11. The main risk is underperformance relative to the position had no DAA process had been adopted. However, even if a position does subsequently underperform, it does not necessarily mean that it was the "wrong" decision at the time that the position was implemented. In other words, it is the quality of the process that is most important, as ultimately this will determine the "success" of the implementing DAA positions, even if not every single decision turns out to add value.

It is important to avoid reacting to short-term underperformance in isolation. There is a risk that an investor will react to the short-term performance of a DAA position by reversing a position that has incurred losses in the months following implementation. In the absence of new information that the original assessment of fair value was flawed or that fundamentals have changed, this type of activity can result in the crystallisation of losses when markets do eventually return to fair value.

Further, there is a number of implementation risks associated with a DAA process, including:

- Subjective adjustments are made to the recommendations arising from the analytical framework resulting in sub-optimal positions being taken

- A decision is made to “ride momentum” at the time when the trigger point to exit a particular position has been reached and markets subsequently turn rapidly
- A DAA position is recommended based on market pricing on a particular date but the process for approving the decision delays the actual implementation until after market pricing has already moved in the expected direction

CASE STUDY 4

Individual Guidelines Covered

This interactive case study addresses Guideline 16 contained in Section C. *Common Processes*

C. Common Processes

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These processes should be considered after the principles regarding investment (Part A) and structure (Part B) have been determined. Although the guidelines in this part apply to a differing extent, depending on the nature of the social security reserve fund and its liabilities, size and other characteristics, it is expected that all these guidelines should be considered by social security institutions in the investment of their reserve funds.

Guideline 16 - Approaches to portfolio construction

The portfolio is constructed with appropriate efficiency and diversification

Background

Below, there are two fictional social security provision frameworks – the first in Strackland, the second in Dinaterra. Participants are encouraged to select the one most relevant to their learning objectives. These examples are used throughout the case studies as a basis for discussion. In some situations, the principles and approaches will be similar; in others (for example related to liabilities) the investment governance implications will be significantly different.

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Social security in Strackland

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Long-term financing projections have been made and recognise the need for direct government financial transfers in the future if contribution rates and benefits remain unchanged.

Social security in Dinaterra

2. In Dinaterra, social security is provided through a Provident Fund financed by employee contributions of 5% and employer contributions of 7%. The fund provides a lump sum at retirement age and guarantees interest of 7% per annum on account balances. Fund account balances are credited with interest every 1 January.

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The Fund was established 25 years ago, aiming "to provide its membership with their benefits, balancing risk and return to achieve performance in the top quartile of its peer group". The peer group is considered as any social security fund of a comparable benefit structure. For Strackland, some partially funded defined benefit pension funds are also appropriate peers, whereas in Dinaterra some foundations and absolute return funds with similar risk tolerances are additional peers. Even where the peer group appears quite diverse, many underlying principles and beliefs are comparable.

Over time, the asset allocations have developed and the current portfolio is laid out below:

Asset class	**%**
Equities – domestic	*15*
Equities – global	*30*
Domestic bonds	*30*
Global investment grade credit	*12*
Property – domestic	*5*
Hedge funds	*5*
Cash	*3*
Total	***100***

Note – this portfolio applies to both the Strackland and Dinaterra frameworks. This is intended not to be a model to follow, but an example of a possible portfolio with room for significant improvement.

Extract from beliefs statement:

High level beliefs

Interest rate risk should be removed/hedged from portfolios as cost-effectively as possible

Diversification improves investment efficiency

Beta beliefs

The Fund is a long-term investor and this can be exploited

Rebalancing between asset classes is important to ensure that risk remains in line with pre-agreed tolerances

There are four primary sources of investment return above the risk-free rate – earning a premium from taking equity risk, credit risk, liquidity risk, or insurance (i.e. investors who are providing insurance to another party expect to be rewarded)

It is appropriate to use credit (e.g. corporate bonds) as part of the Fund's liability-matching assets

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Areas for discussion

The questions and discussion points below are intended to direct the case study debate. They comment on:

- Stages in portfolio construction (points 1 – 2)
- Beliefs (points 3 – 4)
- Asset classes (points 5 – 6)
- Risk (points (7 – 8)

Case study discussion, however, does not necessarily have to be limited to these questions, and wider considerations and ideas are encouraged. In addition, the references and good practices supporting the guidelines also provide examples and resources to contribute towards debate.

STAGES IN PORTFOLIO CONSTRUCTION

1. Outline the stages that should be taken in arriving at a target portfolio

2. Discuss the key parameters that should be used to construct a portfolio

BELIEFS

3. Is the current portfolio consistent with the investment beliefs?

4. How would you expect the beliefs to be shown in the portfolio at a more detailed level (i.e. within each asset class)?

ASSET CLASSES

5. Are there asset classes included in the current portfolio that you would replace, and are there additional asset classes that you would include?

6. What are the merits of including additional asset classes or adjusting the weightings of the existing asset classes?

RISK

7. What measures of risk should be used to monitor the portfolio?

8. What risks should be considered when analysing the portfolio?

STAGES IN PORTFOLIO CONSTRUCTION

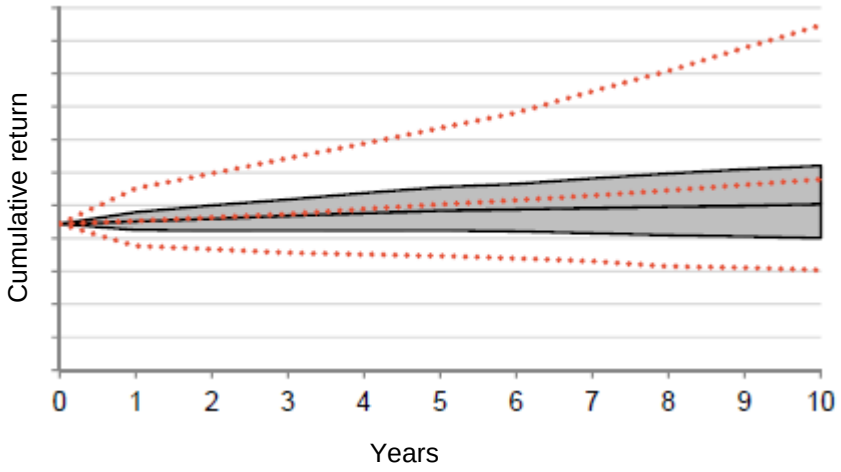
The first stage that funds will typically consider in designing a portfolio is the risk and return target required. This will vary between partially funded social security funds (Strackland) and provident funds (Dinaterra). The Strackland fund may have an objective of a multiple of benefits payments, whereas the Dinaterra may simply target the 7% annual return. In both cases, it is important to calculate an appropriate risk (and return) objective as this will shape the portfolio construction process.

From the agreed risk-return target, partially funded funds may then look to design an appropriate split between return-seeking and liability-matching assets to meet this target. A provident fund can think of liability-matching assets (e.g. government bonds, index-linked gilts) as high quality diversifying assets which form part of a balanced portfolio.

The fund may wish to impose certain parameters such as maximum exposures to certain asset classes (e.g. equities not greater than 50%), or a maximum level of non-domestic investment (e.g. foreign investment not greater than 50%). As long as these restrictions do not prevent the fund achieving its risk and return targets, then these can be easily incorporated into the portfolio construction process.

The risk and return parameters should be considered over multiple time horizons, but are most likely to be useful over a longer period e.g. 10 years. Return targets may be relative to cash, local government bonds, or inflation. Risk parameters may include Value at Risk (VaR), or a % variation from the central projection e.g. lower limit of 80% year 10 target position. This may create a 'funnel' of outcomes that are acceptable as shown in the diagram below:

<u>Projected cumulative return funnels</u>



The diagram shows two different strategies (red dotted line and grey filled area). The central line in each shows the central expected outcome (a median or mean projection of the expected return) with

the outer lines showing possible variation from this based on stochastic modelling of 1 in 20 (of 5% likelihood) scenarios. Here the red dotted line strategy has a slightly higher central return expectation but a much wider variation of results. The grey filled area has a much narrower set of outcomes, but a lower central return expectation. The red dotted line may represent a simple portfolio split 60% in equity and 40% in government bonds. The grey filled area may represent a more diversified strategy such as the one presented in this case study.

BELIEFS

The case study portfolio shows some diversification with a variety of asset classes and both local and global exposure. This is likely producing a more efficient portfolio than one with just equity and (domestic) government bonds alone for example. Depending on the level of conviction in the diversification belief, the portfolio could be considerably more diversified in terms of asset classes (see below), and within asset classes, attention could be paid to diversification of funds and manager types. For example this could be by including a variety of equity manager styles (value, growth, quality etc.) within the equity portion of the portfolio.

The belief about the sources of returns mentions equity, credit, illiquidity and insurance. In the current portfolio there is limited exposure to insurance (the hedge fund allocation may have some). Therefore, consideration could be given to including asset classes such as commodities or reinsurance as a way to access this insurance return premium.

Similarly, there is perhaps limited use of illiquid investments, given the long-term investment horizon of the fund. Here the property allocation is an example, but this is a relatively small proportion of the fund currently. Other asset classes, such as infrastructure and other real assets, could be considered here.

At a more detailed level, in addition to the point above about diversification within asset classes, the question of interest rate risk should be considered. A way to reduce interest rate risk may be by making the government bonds and investment grade credit efficient in duration matching. Also, a liability-driven investment (LDI) overlay could be used, which can use leverage to reduce the interest rate exposure further. This is unlikely to be relevant for a provident fund.

ASSET CLASSES

Below are some asset class considerations. They have been split into equities and alternatives, and credit and fixed income. The merits of including additional asset classes (or removing them from the existing portfolio) should focus back to the risk-return characteristics of that asset class and how they fit in with the fund objectives (questions 1 and 2). If their inclusion (or exclusion) is beneficial from a risk and return perspective, then implementation options should be considered. If there is a reasonable way to access the asset class (e.g. reasonable fees, complies with any legal or regulatory requirements, appropriate liquidity etc.), then it should be added to the portfolio.

Determining the best weightings should be done through running a series of models and scenarios. Mean-variance optimisation can have flaws particularly around suggesting impractical portfolios, and any modelling needs to be overlaid with practical considerations and strategic thinking. It is important to consider a wide variety of economic scenarios to understand a range of possible outcomes of any given portfolio. Sensitivities around assumptions can also be helpful here as they give additional information about likely outcomes.

Equities and alternatives

This set of assets will likely drive the bulk of the return target. To find the appropriate mix, it is important to consider investment beliefs, diversification, costs, scale, and governance capabilities. There are many options here ranging from having a simple portfolio with one or two asset classes to a very diverse portfolio with many. Additionally, there are many implementation options – internal or external management, pooled or segregated funds, direct investment, and multi-asset funds such as diversified growth funds (DGFs) to name a few. Also active, passive or semi-passive can be considered here (see case study 5 for more details).

- Equities – also considering the balance of active and passive management, looking to get complementary/diverse styles of management (e.g. growth, value biases), as well as global diversity including emerging markets. Also relevant here could be semi-passive ideas such as fundamental indexation and factor investing which are cost effective way of getting different equity exposure to the traditional market capitalisation method.

- Property – offering diversification benefits and some inflation-linked returns

- Infrastructure – similar benefits to property and well-suited partially funded funds. Other real assets could be considered here too such as agriculture, timberland, renewables etc.

- Reinsurance – an asset class that has shown very low correlation with equities and offers some extreme risk diversification

- Hedge funds – a very wide range of options available here that could offer interesting and diverse ways of driving high returns, often using leverage and derivatives

- Emerging markets debt and currency – two other ways to access emerging markets besides equity that could exploit the long-term emerging growth and wealth theme

- Private debt, MBS, ABS – high yielding but high quality assets that are a diverse source of return driver from equities and more mainstream types of credit

These asset classes can be invested in directly (internally or externally via single investment managers) or via packages (such as diversified growth funds and other similar funds/products). The key is to ensure that the fund can find the combination of asset classes in a cost effective manner that best helps to achieve its goals.

Credit and fixed income

This portion of a portfolio can be considered as a primary source of liability hedging for a partially funded fund, or as a source of high quality, stable and diversifying returns for a provident fund.

- Government bonds – alongside cash, government bonds are acceptable as collateral for LDI arrangements. It is important to consider the duration of a bond portfolio to provide better matching for liabilities (potentially not relevant for Dinaterra). It is important to consider "curve risk" here as well (see below). A bond portfolio can cover multiple durations, global diversity and include nominal and index-linked options.

- Corporate bonds – similar to equities, there are active, passive and semi-passive ways of managing corporate bonds that can be considered.

- Alternative credit strategies – there are a wide range of other options related to credit, including high yield bonds, bank loans (leveraged loans), special situations, securitised credit, direct lending, and multi-strategy credit which looks to combine many of them (in a multi-asset fund structure). These tend to have an increased return element as well as strong credit diversification benefits. As these also tend to have less liability matching properties, they could feature as part of the return-seeking assets.

RISK

There are a variety of measures of risk available, perhaps the most common of which is Value at Risk (VaR). As discussed in questions 1 and 2 above, a funnel of outcomes could be a sensible way to consider a fund. Tracking progress within this funnel, and looking at the risk of certain outcomes could be a good way to monitor fund performance. The funnel could produce performance outcomes such as the fund position in a 1 in 20 downside scenario.

Some risks that the fund may be exposed to are outlined below. There may be addition fund-specific risks that should be considered depending on circumstances. An important tool for monitoring risk could be scenario analysis and sensitivity calculations. These offer a way to monitor the portfolio under a variety of possible outcomes which can highlight the fund's exposure to certain events and correlations even if they aren't currently present (and therefore not showing up in a VaR measure).

Interest rate and inflation risks

These may be particularly significant for partially funded funds. They can be addressed principally through the liability-matching assets (credit and fixed income) and any LDI enhancements. The government and corporate bonds portfolios can be structured to match the liability profile as best as possible. This can be done through duration matching, but with care to minimise "curve risk" where there are concentration differences at different points of the interest rate curve. With implementing an LDI portfolio, consideration should be given to the quality of collateral used, with care to ensure that there is sufficient available to meet any further collateral calls, or service other requirements such as longevity.

Equity risk

From a return-seeking asset perspective, equity risks tend to dominate similar funds, but can be managed through diversification as well as some protection strategies. Equity options can be used to protect against downside movements, however, as with other risk reduction strategies, it is important to consider the return impact here and cost of hedging any associated risk.

Longevity risk

As other risks are reduced or eliminated, longevity risk may become a focus for partially funded funds. Longevity swaps offer a way to manage this risk, with similar considerations to LDI and equity options as above.

Other risks and constraints

As part of the overall strategy, it is important to consider constraints such as liquidity needs and governance capacity. Currency risk also tends to feature but at a smaller scale and dependent on the geography and underlying exposures of the assets chosen. This should be borne in mind during the portfolio construction phase. It is also important to think about the portfolio as a whole, to see the interrelations of exposure and risk across all asset classes as these are not always additive.