

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

September 2011 examinations

Subject SA6 — Investment Special Applications

Purpose of Examiners' Reports

The Examiners' Report is written by the Principal Examiner with the aim of helping candidates, both those who are sitting the examination for the first time and who are using past papers as a revision aid, and also those who have previously failed the subject. The Examiners are charged by Council with examining the published syllabus. Although Examiners have access to the Core Reading, which is designed to interpret the syllabus, the Examiners are not required to examine the content of Core Reading. Notwithstanding that, the questions set, and the following comments, will generally be based on Core Reading.

For numerical questions the Examiners' preferred approach to the solution is reproduced in this report. Other valid approaches are always given appropriate credit; where there is a commonly used alternative approach, this is also noted in the report. For essay-style questions, and particularly the open-ended questions in the later subjects, this report contains all the points for which the Examiners awarded marks. This is much more than a model solution – it would be impossible to write down all the points in the report in the time allowed for the question.

T J Birse
Chairman of the Board of Examiners

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General comments

Candidates are reminded of a bias in the paper towards recognising higher level skills and practical application – this is intentional and will continue. Likewise the examination system does properly allow for prior subject knowledge to be assumed. Investment is a necessarily practical subject and, at this level, the examiners expect candidates to demonstrate a breadth and depth of competency as would be expected from a recently qualified actuary or senior student in a frequently evolving discipline. Hence simple regurgitation of bookwork will never be sufficient to ensure a Pass grade – and this was evident from the dispersion of candidates' responses in the more differentiating questions.

In order to succeed, candidates must ensure they familiarise themselves with the prevailing investment issues and the general market background facing institutional investors in the 12–18 months preceding a diet, more so the solutions (and sources of) being debated by the various stakeholders. Given the volatility in recent years and the diversification into new asset classes and management styles, one of the more persistent arguments has surrounded the respective alpha v. beta contribution to returns and how they should be best sourced. A clear trend has been also the move towards defined contribution arrangements and the need for investment solutions that balance risk and reward appropriately given the sophistication of the investor. Investors have also focussed on different legal structures to gain exposure to asset classes which will blur the traditional equity/debt allocation divide. Given an overall appraisal framework of “quality, security, profitability and liquidity”, candidates need to be able to explore the trade off each opportunity represents and any new types of risk (such as operations, liquidity, credit, model and counterparty) incurred that justify new ways of regulation, monitoring (and against what benchmark) and management. As actuaries move into wider fields, the examiners are likely to focus on the application of core skills in what may appear unfamiliar situations. However, better candidates should be able to identify the key principles and considerations that a solution demands since this should be a feature of their “day job”.

Specific comments on September 2011 paper

Disappointingly, this was a very poorly answered paper even compared with previous diets. Although the pass mark was raised from the previous diet, the average mark still remains much lower than the examiners feel ought to be achievable by candidates, who are likely to be working as advisers or asset managers in this most practical of fields. Whereas previous papers had looked to examine capital market or government policy detail, this paper focussed more on practical fund management considerations and hence ought to have been more familiar territory than the marks scored would suggest.

Candidates typically answered Question 2 better than the others (albeit foregoing more than half of the marks available) with Question 3 attracting the worst response with average scores of less than a quarter of the 30 available marks.

Those candidates that were unsuccessful will find their solutions lacked sufficient (and often the most basic) detail or application of knowledge and scored lower accordingly. Many candidates still deviate from the topic and include irrelevant material or over emphasise minor points – although candidates will not be explicitly penalised for this, it gives an impression of a lack of understanding and, more importantly, wastes limited time. Time and priority management are key skills actuaries need to have. Where candidates made relevant

points in other parts of their solutions, the examiners have used their discretion as to whether to recognise these answers or not. Likewise the examiners share and agree alternative possible solutions to questions during the marking process.

- 1** (i) There are a number of factors to consider, which can be broken down into the following categories:

People

Quality of senior people – their experience, track record, motivation/enthusiasm and commitment to the business

Depth of resources – the number of investment staff involved for each major sector, the dependence on any “star” fund managers

Continuity of staff – this is particularly the case where the investment manager has had a successful track record in the past, and some of the key contributors may have moved on

Retention mechanisms – how are senior or key staff incentivised to remain with the business

Investment process

The firm should have a clear understanding at all levels of how it expects to outperform a benchmark including the following:

- Internal vs external research
- Buy and sell disciplines
- Asset allocation approach

Past performance and attribution analysis can be helpful in evaluating the consistency of the process, and analysing manager actions.

The decision structure should be clearly articulated in terms of the manager's ability to make fast and effective decisions.

Business management

Quality of systems – high quality systems can enable staff to focus on investment decisions, rather than fund administration

Policy for growth of business, including restricting inflows into capacity-constrained strategies

Ability/plans to build capacity where internal resources are the limiting factor – hiring new people, or buying or building new systems

Training/development of new staff – this is essential for a business to grow organically

Risk controls – a risk management culture is important

- (ii) **Fees** – the lower the fee for a given level of perceived skill, the more attractive an external manager will be as a partner

Brand name – the passive manager can gain credibility by partnering with external managers who are generally regarded as skilful, which may help take-up of its products

Administration – external managers will need to have efficient accounting systems and administrations processes to form part of a DC platform or multi-manager fund

Dealing arrangements – external managers who are flexible in terms of notice periods and dealing dates will be more able to fit inside a DC format where regular dealing dates (monthly at least, and typically weekly) will need to be offered to investors

- (iii) The main technique that would be used in portfolio construction is risk budgeting, and this would be backed up by attribution analysis of the total risk to the various risk exposures.

Risk budgeting

Risk budgeting is a process to establish how much investment risk should be taken and where it is most efficient to take the risk (in order to maximise return), by selectively taking active (alpha) and strategic (beta) risks.

The risk budgeting process comprises the following steps:

1. Define the feasible set – the set of available asset classes and estimates of their expected returns, volatilities and correlations.
2. Choose the initial asset allocation using a risk / return optimisation process, and with a VaR assessment to determine the risk tolerance.
3. Monitor risk exposures (increases and decreases in the values of the positions) and changes in volatilities and correlations.
4. Rebalance the portfolio in response to changes in the short-term volatility and correlations of the assets. Allocations are altered to keep the overall portfolio risk at the level defined as tolerable for the investor.

A risk budgeting approach lends itself well to a diversified strategy as volatility can be reduced (or expected return increased) by finding new asset classes with a low correlation to existing asset classes within the portfolio.

Risk attribution

A model can be created that estimates how different asset classes are exposed to different market risk exposures (e.g. a corporate bond is exposed to credit risk and interest rate risk).

Typical market risk factors would include: interest rate risk, inflation risk, credit risk, currency risk and equity risk, although many models extend this list to include other factors.

By analysing the risks contained within a portfolio by risk exposure, a picture can be built up of which risk premia the portfolio is exposed to, and hence how diversified its sources of return are.

The diversification benefit is the difference between the sum of the risk exposures at an asset class by asset class level and the total risk obtained from the risk budgeting model.

This is an additional insight to looking at asset class or manager style diversity alone.

Additional analysis

Work could also be done to look at tail correlations across asset classes.

This reflects that asset classes often exhibit higher levels of linkage under stressed scenarios than in more typical conditions.

This could either be done by creating user-defined scenarios, or by looking at historical scenarios, and how asset classes behave under these scenarios.

The insights this modelling can give can help ensure that the portfolio achieves diversification benefits even at times of market stress, although some increase in correlation is likely to be inevitable.

- (iv) **Complexity** – DC investors are often accustomed to investing in simpler single asset class funds and constructing a portfolio themselves, as opposed to investing in a complex multi-asset fund. The approach of outsourcing the portfolio construction will need to be explained in promotional materials, but is generally considered appropriate for default strategies where a DC investor does not wish to make such decisions.

Administration/liquidity – due to its holdings of alternative asset classes (with delayed reporting) a diversified fund may not have daily or weekly liquidity unlike many other unitised funds. This can be overcome by using proxy values for dealing prices and limiting illiquid holdings to a specified proportion of total assets.

Costs – potentially some of the asset classes to be invested in may have high investment management fees, and high expenses. This can be mitigated by managing the proportions of the portfolio invested in high and low cost asset classes so as to obtain an acceptable total cost.

2

(i) (a)

- request trust deed to understand objectives fully
- Statement of investment principles, several years of accounts, tax status, existing investments and management arrangements (to assess cost of change) any restriction on buying/selling certain asset classes
- prescribed/permitted assets
- particularly rules on the holding in OIT
- size of trust assets
- valuation basis for unlisted asset(s)
- current funding position
- pattern of funding position over past 5 years
- other sources of income beside investment returns e.g. regular contributions from donors
- how reliable are these other sources of income? Annuity in nature?
- details of outgoings, total cost per student
 - what do college fees cost
 - are text books, extra curricula activities included
- college fee inflation historically and future expected
- how many students is trust required to fund; is number variable
- admin expenses and other costs incurred in running of trust
- tax status of fund

(b) Choice of SAA:

- nature of liabilities. College fees are real in nature and may increase by more than inflation every year. Need to invest a portion of trust assets in real assets such as equity or private equity which will maintain purchasing power over the years
- currency of liabilities: need to invest in currency of liabilities. Need to know whether all colleges are in domestic market. If not, where are they situated and what currency used? Even if only sterling liabilities, say, global equity/bonds are good for diversification etc.

- term of liabilities: college lasts for 3–5 years but assume trust will exist in perpetuity so long term in nature allowing investment in riskier assets like equity
 - taxation: need to consider how trusts are taxed. Income tax vs capital gains tax.
 - income requirement: because trust is paying fees every year, a certain amount of income is needed every year. Bonds may be suitable investment to meet this requirement
 - liquidity requirements: beside the fees that are paid every year there may be administration expenses to be funded. Otherwise the liquidity requirements should be minimal allowing for a long term investment strategy to be adopted.
 - risk tolerance of trust: because trust is providing such an important service there is a low risk tolerance – can't have situation where can't afford to pay fees anymore. This can result from inflation and asset depletion or too aggressive investment strategy. Need to find balance between real assets for real growth and stable assets for secure income.
- (c) Asset allocation proposal is open to interpretation: as long as student gives justification
- assume all students are going to college in domestic market
 - assume the trust more than adequately funded with assets > liabilities
 - assume fees and admin fees increase every year in line with inflation
 - c.45% bonds – to generate income to pay fees every year. Can be mixture of government bonds and higher yielding corporate bonds?
 - 40% equity (including OIT) – need real assets to maintain purchasing power of trust assets over time
 - 10% – global equity – don't need to invest in other currencies as liabilities are denominated in domestic currency but this is good for diversification, exposure to sectors not available locally and is also a real asset
 - 5% – money market instruments/cash to be able to fund the administration expenses and other day to day running costs
 - might not allocate to global bonds as yields are currently low

If funding position is less favourable will need a higher allocation to less volatile, income generating assets like government bonds and less allocation to equity.

(ii)

- OIT is not in a good financial health [1]
- the textile industry generally is in dire straits
as a result of cheap imports from the east flooding the market;
dumping of second hand clothing etc.
labour costs low but still uncompetitive [3]
- high debt to equity ratio and increasing over time; [1]
what is industry norm? [1]
- could be distress borrowing to fund working capital
- would want to know what interest cover is and whether it can service its
interest with ease [1]
- access to funding [1]
- would want to see income statement, balance sheet and cashflow statement
as well [2]
- quality of earnings, is there good cashflow? [1]
- what is ROA and trend? [1]
is capital being efficiently employed [1]
- dividends exceed earnings and trend is worsening [1]
- this is unsustainable; hence a threat to cash flow of the trust [2]
- sales are falling in real terms – not good sign [1]
- net profit margin is falling, company becoming less profitable [1]
is the profit margin above or below industry average? [1]
- future prospects for the industry and business: management, industry and
analyst's views [2]

Must ascertain if this is the bottom of a cycle or if the business is in terminal decline

(iii)

- such a large holding exposes the trust to large specific risk
which would normally be diversified away in a diversified equity
portfolio

- the trust has an equity exposure of 25% that it can't actively manage by virtue of it being unlisted
- given the nature of OIT's business it has further risk implications:

The fund is heavily exposed to a financially distressed asset with a high likelihood of failure, causing the trust to lose 25% of its assets

The trust's income stream (from dividends) will probably drastically diminish possibly causing liquidity problems with funding regular outgoings

- if the holding is a controlling stake the trust could seek to negotiate an exit via a merger, MBO etc.
- as a minority shareholder the trust has few options available
- could seek to sell some of the holding but very difficult as not listed unless majority wants to buyout
- illiquid nature of investment, can't easily convert holding to cash
- may incur high transaction to sell
- may incur high capital gains tax liability if sell
- trust deed may forbid the sale of the shares or they may be moral issues if family still connected/involved

(iv) *About the PEF:*

Legal nature of structure (limited partnership, exiting partners etc.);
This has implications for the rights and obligations of the parties and determines the tax treatment

Remaining term of the PEF, if applicable
This is an indication of how soon the trust can expect a return of capital

Objectives of fund; must be compatible with the ethos of the trust

Modus operandi of the fund; competitive advantages; market niche exploited

Current and envisaged portfolio composition
Degree of diversification by company and sector
Exit strategies for its various investments
When they expect to return capital to investors
Want any information that indicates the types of risks the PEF takes on; what % of investments are likely to fail; will fund achieve the desired hurdle rate and what the return is likely to be
Does the portfolio distribute income? Will the trust be able to manage if income levels are reduced sharply from current levels?

Ultimately the trust must assess whether the PEF is a more suitable vehicle (in terms of risk, nature, cash flow, liquidity, tax etc.) than shares in OIT

Management credentials, experience, probity etc.

Their track record in securing deals and successfully managing companies.
This is possibly an indicator of future success.

Past performance of this fund and similar funds managed by the same managers

Fee structure: basic fee, hurdle rate, carried interest. These are usually substantial and they must be warranted

About the terms of the deal:

In order to assess the fairness of the swap ratio

Valuation placed on OIT (independent/audited)

Valuation basis for PEF's assets

Deal structure:

will it be a sale and purchase; This might have CGT implications
any cash timing

PEF's interest in (the rather precarious) OIT

Is it an asset stripping exercise? Is that in the spirit of the trust?

Its ultimate exit strategy for OIT

Will the trust be expected to participate in PEF's future draw downs?

- 3** (i) (a) Solves some problems related to multiple managers with same mandate:
- Quite possible that some will outperform and some underperform resulting in mediocre overall performance, possibly failing to beat the benchmark
 - The core portfolio (bulk of assets) should perform closely in line with the benchmark
 - But still paying active manager fees;
 - in fact paying performance related fees to some even though overall performance may be average
 - In general, passive fund management reduces the need for active management expertise & so offers lower management fees.

- Managers with different views could cause the fund to be simultaneously buying and selling the same counters, thereby incurring trading costs for no gain
 - Although this could still happen among the satellite managers, there will be no trading required within the indexed portion

Apart from diversifying single manager risk (i.e. the risk that one manager's view in wrong and performance suffers) the current arrangement is very inefficient:

- No style diversification
- Duplication of resources and expenses e.g. time and costs to monitor & appraise many similar managers

Solves problems related to the size of the fund:

- If markets are efficient, then is difficult to out-perform over the long-term, therefore, employing active managers incurs a cost that is not rewarded.
 - Historical evidence can be shown to support this view.
- The fund will have been limited to using large managers as only they will have the capacity to manage large mandates;
 - Excludes possibility of accessing the expertise of smaller managers or managers with niche styles
 - With specialist mandates of smaller size can tap into niche managers
 - And access specialist styles in a bid to extract alpha
- Very large funds are restricted in their ability to trade effectively due to marketability constraints
 - Market impact costs will be very high: aggressive buying or selling will push prices against them and impair performance
 - Limiting their ability to take active positions and so achieve a result much better than the benchmark
 - Consequently they often become closet index trackers
 - They may not be able to take meaningful stakes in small cap stocks without falling foul of internal tradability or ownership limits

- The active satellite funds would be considerably smaller than the original portfolio
 - Therefore could be managed actively without many of the disadvantages of large funds.
 - In addition, the active management mandate could involve a much greater degree of risk-taking because the funds represent only a small proportion of the total fund.
 - This will allow the active manager to back his “bets” with more conviction without worrying about commercial matching or risk relative to a benchmark or liabilities. This should lead to more efficiency and success in the longer term.

Other considerations:

- Reduces the tracking error of the portfolio for the indexed part and hence volatility against benchmark.
 - This might be helpful when using derivatives to eliminate cross-hedging risk.
 - Or in managing risk relative to actuarial assumptions

(b)

- Indexation will result in the bulk of the equities producing a return of less than the benchmark, after payment of fees.
- On that part the fund foregoes any chance of benefitting from superior stock selection or sector rotation or manager selection.
- The trustees (via their advisors) will have to do far more initial and ongoing due diligence on the specialist managers
 - in order to identify managers that produce reliable sources of alpha
 - and ensure that they are performing according to expectations for their individual mandates.
- And having more diverse managers will lead to greater administration and monitoring costs.
 - It may be more difficult to obtain overall performance data on a regular basis and do meaningful performance attribution
- The mix and spread of satellite portfolios will be a subjective decision to a large extent since it is not possible to model an optimum allocation;

- also some styles will overlap.
 - This may introduce some structural risk in that the combination of all of the passive portfolio's benchmark and the active managers' mandates may not exactly equal the overall benchmark set by the actuaries for the scheme
 - Index funds cannot be made to fit the needs of a particular fund and can only be based on an established index. So there is a loss of control of any customization.
 - There will also be significant restructuring costs – both administrative costs of appointing new managers and costs associated with realigning the portfolio holdings – if such a policy is implemented.
 - The fund's bargaining power will be less with the smaller mandates allocated to satellites causing higher fees.
- (ii) (a) Small cap portfolio
- Small caps definitely produce a distinctly different performance profile and so are worth considering as a possible way to add alpha.
 - They are also less researched and there tends to be less information about them leading to a higher probability of mispricing which savvy investors can exploit (i.e. this market is less efficient).
 - There are managers that specialise in small caps who could be appointed to manage a mandate.
 - The availability of small and mid cap indices make benchmarking and performance measurement straightforward.
 - The biggest problem with small caps is the lack of liquidity.
 - The manager would experience severe tradability issues.
 - And the larger the manager's portfolio under management the more severe the problem.
 - The potential impact on performance cannot justify the effort required to monitor an extra manager.
 - Should the manager disappoint, it will be extremely difficult to liquidate or re-align the portfolio given the liquidity constraints.

(b) A deep value style mandate

- An advantage would be that certain managers are better at managing to a particular style and hence produce better long-term returns.
- The deep value philosophy is intuitively attractive for a long-term savings vehicle since it is predicated on buying shares when they are out of favour and prices are much lower than the intrinsic value and then holding them until they rerate.
- The downside is that the fund will miss out on momentum driven rallies and the performance of fast growing companies.
- There is a value index that can be used for benchmarking.
- But value can take many years to emerge so performance assessment over the short-term is not meaningful.
 - The fund may have to endure long periods of underperformance.
- Domestic market structure may make implementation of this type of philosophy problematic
 - The portfolio could end up with only a few shares and hence have concentration risks.
 - The lack of liquidity may be worse in deep value stocks since they are out of favour.
 - At times there may be few or no shares that fit the deep value description and in that case the mandate will usually allow the manager to hold cash.
 - But this could result in paying high fees for a cash portfolio
- This can be seen as a risk control that reduces the equity exposure when markets are overvalued.

(c) A high dividend portfolio

- These funds are usually targeted at individuals who require a high level of income but wish to maintain some exposure to capital growth opportunities
- Companies with high dividend yield tend to have less volatile prices and often offer a solid value proposition, attributes that the fund might like

- But they would also tend to produce slower capital growth
 - The focus on yield is likely to be at the expense of superior overall returns which is what the active members would want an equity portfolio to deliver
 - There is likely to be a large overlap with the deep value fund at times so this fund would cause some duplication among the satellites
- (iii) There is empirical evidence that indicates that equally weighted portfolios produce better returns than cap weighted ones

This can be explained intuitively by the fact that cap weighted portfolios force the investor to be overweight in expensive shares and underweight cheaper ones. (Strong momentum bias)

The situation becomes even more pronounced when a bubble forms in one sector (such as the tech boom prior to 2001). When the bubble bursts, performance is wrecked by the excessive exposure combined with the sector's steep valuation decline.

It is difficult to justify an equally weighted portfolio when there are very large disparities of size and marketability; but this should not be an issue.

It prevents domination of the index by a few counters.

As a benchmark an equally weighted index has some of the attributes of good benchmarks:

- It is specified in advance, understandable and easy to calculate
- It covers the investable large cap universe
- It will behave like a real portfolio

But it also lacks some of the characteristics of a good benchmark:

- Most importantly it will require continual rebalancing as the market prices of the constituents move and cause the weightings to change.
- The benchmark will require some form of rigorous rebalancing algorithm;
 - Perhaps quarterly rebalancing;
 - Possibly only rebalance half way to avoid unnecessary trading should the market movements reverse
- A portfolio tracking such an index will incur trading costs even when there is no change in fundamental view, causing a drag on performance.

- This benchmark will lack the associated data that enriches the conventional indices (items like income yields, subsector performance etc.)
- Which will hamper performance attribution
 - There will be no liquid, exchange traded derivatives that match such a benchmark
 - So limiting the portfolio management techniques available for changing exposures with well-priced instruments

END OF EXAMINERS' REPORT