Investment Management 1999 (vers 6 Sep)

Paper 1, Question 1 (15 marks)

Where a student gives what you believe to be a valid comment which is not part of the marking guide, then award marks according to your own judgement, but:

- It is preferable that you make a note of the additional comments
- It is also preferable that you record which candidates made those comments
- The marks awarded will normally be limited to the maximum allotted for the particular part of the question.

(a)

If the student's answer reveals that they do not understand either the concept of gearing or beta, then the maximum allowable is 1 mark.

An increase in gearing would be expected lead to an increase in beta. (1 mark).

In a highly geared company, the net value of the company as "assets - debt" will be highly sensitive to the movements in either asset values or the value of debt (and thus interest rates). Thus a more highly geared company will tend to be more sensitive to the sort of factors that move the stock market as a whole, and so have a higher beta. (2 marks)

(b)

- If the SPI moves dramatically away for its current value
- If Implied volatility increases

(1 mark for each point)

(c)

- It fixes a maximum time horizon for the fund, which reduces each year – suggesting fixed interest investment
- Exposes the fund to negative cash-flows at some point in the future – need some highly liquid (or short term) investments, and this will require cash-flow management.
- Inability of the fund to absorb investment fluctuations – need less growth investments, the amount will depend on the surplus of the fund.

(1 mark for each point – to a maximum of 3 marks)

(d)

- Number of separate companies (1½ marks)
- Number of separate industries (1½ marks)
- Number of separate countries (1½ marks)
- Reducing marginal diversification – e.g. as the number of countries in one industry increases, the marginal increase in diversification for each new company is lower (1 mark)
- Diversification by region (regional impacts on emerging markets can be severe and highly correlated – e.g. Asian crisis) – so little extra benefit from exposure to several countries within one region (2 marks)
- Exposure to highly regulated economies (especially pegged currencies) do not greatly increase diversification – these are vulnerable to market shocks and can suffer highly correlated share market crashes (e.g. Asian crisis) (1½ marks)

(to a maximum of 7 marks)

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Paper 1, Question 2 (17 marks)

Where a student gives what you believe to be a valid comment which is not part of the marking guide, then award marks according to your own judgement, but:

- It is preferable that you make a note of the additional comments
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Students will not be penalised for using incorrect values from earlier answers in the calculation of later answers. Calculations that rely on the results of earlier questions are underlined.

(a)

Option value = 500 x $40 x 25 = $500,000

(b)

Fixed Interest = $30million.

Equities = $50million + 500 x 0.35 x $25 x 3000 = $63,125,000

Cash = $20million + $500,000 –500 x 0.35 x $25 x 3000 = $7,375,000

(c)(i)

$-value increases :

- Fixed interest = $30 million x 1.00% = $300,000
- Equities = $50 million x (10190/10000 -1 +0.25%) = $1,075,000
- Cash = $20 million x 0.40% = $80,000
- Option = 500 x 55 x $25 - $500,000 = $187,500
- Total increase = $300,00 + $1,0750,000 + $80,000 + $187,500 = $1,642,500

% return = $1,642,500 / ($100,500,000) = 1.63% (per month)

(c)(ii)

- Cash growth = 0.40% x $7,375,000 = $29,500
- Equity growth = $1,642,500 - $29,500 - $300,000 = $1,313,000
- Equity return = $1,313,000 / $63,125,000 = 2.08%

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Paper 1, Question 3 (20 marks)

Where a student gives what you believe to be a valid comment which is not part of the marking guide, then award marks according to your own judgement, but:

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(a)

To fully explain the concept, one would need to explain the concepts of modified duration and convexity, what it means to be immunised, and how this leads to profit only from parallel movements in yields. The answer must use words that an MD is likely to understand.

Award marks as follows :

- Put answer in the form of a letter (½ mark)
- Demonstrate an understanding of immunisation (3 marks)
- Explaining without using (unexplained) technical terms (2 ½ marks)

(b)

- Identify that only a portfolio of the 2 year CGS and 9 year CGS will be likely to have a larger convexity than the liabilities, due to the "barbell" nature of such a portfolio. Including either of the other two would result in them dominating the portfolio, with very little spread across the curve.
- Solve for A and B : (A x 1.05 + B x 1.22) = 85, and (A x 1.05 x 1.82 + B x 1.22 x 6.06) = 85 x 2.55
- B = 85 x (2.55 - 1.82) / [1.22 x (6.06 - 1.81)] = $12.00m
- A = 85 x (6.06 - 2.55) / [1.05 x (6.06 - 1.81)] = $67.01m

Award marks as follows :

- Identify that the 2 & 9 year bonds will be the best candidates for immunisation (2 marks)
- Identify the equations to be solved for value and interest rate sensitivity (2 marks)
- Arriving at an answer in the right ballpark (2 marks)
- Solving those equations and getting the right answer (2 marks)

(c)

- Insufficient cashflow in each 6 months over the first 1.5 years. This will require assets to be sold prior to their maturity to maintain the immunisation.
- Exposure to the yield curve steepening in the 5-9 year part of the curve.

Award marks as follows :

- Non-parallel movements in interest rates (1 mark) or explaining that the risk is specifically to the yield curve steepening (2 marks)
- Cashflow mismatches (1 mark)

(d)

- Use average yield of assets (rough, dependent on assets chosen)
- Construct a zero-coupon curve from CGS (more appropriate, more difficult)

Award marks as up to 1 ½ mark for each valid point.

Investment Management 1999 (vers 6 Sep)

Paper 1, Question 4 (24 marks)

Where a student gives what you believe to be a valid comment which is not part of the marking guide, then award marks according to your own judgement, but:

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(a)

Strategic:

- Asset consultants (advice, statistical analysis, asset / liability models, re-balancing),
- Trustees (meet inv objectives)

Tactical:

- Investment managers (change asset class weighting in balanced funds),
- TAA overlay managers (TAA services, derivatives),
- Trustees / Asset Consultants (sometimes make medium term asset allocation decisions)

(1 mark for each point, to a maximum of 4 marks)

(b)

To : the Asset Allocation Committee

From : Me

Subject : Long Term Asset Allocation

Long term strategic allocation

- Agree that long term strategic asset allocation is a good idea (allows short-term views to be converted into tactical shifts away from a well-defined base).

Problems with mean-variance

- Setting assumptions – it is difficult to come up with reasonable estimates of returns, variances and correlations.
- Error maximisation – any small estimation errors in assumptions (such as the expected return of a class being slightly too high) will have large implications for the portfolio selected.
- Near optimal portfolios – the model can produce quite different portfolios that have similar risk/return characteristics, making it difficult to select the “best” portfolio.

Problems with using historical data

- Probably not sufficient history.
- Structure of economy may have changed (includes pre-84 data, prior to de-regulation).
- Includes Oct-87 crash, which may distort results using such a short history.
- Future inflation may be lower than past inflation.

- If used without adjustment, may give unreasonable results (e.g. lower risk classes having higher returns).
- Insufficient data for more recent classes, such as indexed bonds, emerging markets etc.
- Difficult to obtain data for direct property.
- Direct property returns are likely to have artificially low volatility due to valuation methods which tend to smooth fluctuations.

Problems with optimisation approach

- Standard deviation of competitors likely to be high compared to the model, due to inclusion of Oct-87 crash and 1994 bond crisis.
- May not reflect the needs of their current clients or target clients.

Some modifications

- Use constrained optimisation
- Modify results from historical analysis, based on general reasoning and Stein estimation
- Perhaps base estimates of competitors' volatility on their average or target asset allocations.

(1 mark for putting in the form of a report to the committee, and 1½ marks for each valid point, to a maximum of 20 marks)

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Paper 1, Question 5 (30 marks)

Where a student gives what you believe to be a valid comment which is not part of the marking guide, then award marks according to your own judgement, but:

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(a)

Risk differences

- Liquidity / marketability : Nominal bond is more liquid / marketable
- Interest-rate risk : Duration x nominal yield volatility vs Long duration x lower real yield volatility
- Inflation risk: Nominal bonds will out-perform over the long term if actual inflation lower than implied inflation (nominal yield – real yield).
- Nominal bonds are easier to hedge (using 3 and 10 year futures)

Return differences

- Hold-to-maturity return : Nominal yield vs real yield + inflation
- Nominal yield affected by real yield + inflation expectations + inflation uncertainty
- Expected return from nominal bonds should higher than indexed if inflation uncertainty is high, but otherwise lower, due to compensation for the illiquidity of indexed bonds.

(1 mark for each point, to a maximum of 5 marks)

(b)

Comments on suitability: (suggested solution — comments in brackets are not required, but may result in additional marks if included)

- The index includes securities with very different risk/return profiles, so these should be treated as separate asset classes (and separate indices). (However, the same argument can be applied to the All Ordinaries). (2 marks)
- As the prices are given on the following day, it would not be possible to use the index makers pricing for fund accounting and unit pricing. This would introduce spurious excess returns. (1 mark)
- The inclusion of securities with less than AUD100million on issue makes replication difficult, which will not be popular with some index-tracking fund managers. (In practice, it is unlikely that index managers will actually try and fully replicate the bond index. What is does mean is that you will have some very illiquid issues in the benchmark). (1½ marks)
- Indexed bonds, floating rate notes and asset-backed securities are all considerably less liquid than nominal bonds. (In addition the value of a MBS can be significantly less than the face value, due to principal pass-throughs). (1½ marks)
- The use of a committee to determine changes makes the index construction impartial. (1 mark)
- However, it does reduce the transparency of the index, making replication difficult. It may cause problems with delays in inclusion of certain securities, and could possibly still be criticised for bias if, for example, the committee did not include all bond originators, or did not include all major fund managers. (It depends on what procedure and time frame for change — note that the MSCI share index has a committee that oversees the procedures for change). (1½ marks)

- By announcing index changes only on the day they take effect, it can be difficult for fund managers to replicate the index, as they must "catch-up" buy. (1 mark)
- Privately placed issues can be extremely illiquid, reducing the ease of replication. (1 mark)
- Most funds will have restrictions on credit rating, and will be unable to buy un-rated securities or securities below investment grade. Indeed, many managers cant go below A-, while investment grade is BBB-. (1 mark)
- The inclusion of income and capital gains and the market-value weighting of returns are both appropriate. (1 mark)

Possible improvements:

- Do not combine the indices, rather produce a suite of indices, such as "Fixed Interest", "Inflation Indexed", "Floating Rate Notes". For completeness, have sub-indices which include/exclude either corporate bonds or asset-backed securities. (1½ marks)
- Arrange for timely electronic price collection at the end of day, with the scope to extend the system to intraday pricing. (1 mark)
- Increase the minimum amount of issue to either AUD100 million or AUD500 million. (1 mark)
- Establish a clear set of rules, including a minimum credit rating. Privately placed issues should be excluded, if one can produce a satisfactorily clear definition of these. (1 mark)

(to a maximum of 14 marks)

(c)

- The Australian bond market is only a small percentage of the global bond market, and so forms only a small portion of the typical global bond portfolio. Fund managers would require some flexibility in their asset allocation, so would restrict their investments to more liquid securities (such as Commonwealth and Semi government securities, or securities with at least AUD500m on issue). (2 marks)
- Overseas investors may restrict their non-government investments to bonds which are free of interest withholding tax – the index may reflect this. (1 mark)
- There is an argument that, for consistency, the domestic and global version of the indices should be the same . (1 mark)