Institute of Actuaries of Australia

2010 PART III EXAMINATIONS

Subject Title: **C1**
Investments

Date: **Monday 18th October 2010**

Time**: 9:15 am – 12:30 pm**

Time allowed: Three (3) hours plus fifteen (15) minutes of reading time

Instructions: Each new question (but not each section of a question) must be commenced in a new answer book.

Number of Questions: **Five** (5)

Question	Marks
1	15
2	18
3	25
4	16
5	26
Total	**100**

Candidates are required to answer <u>ALL</u> questions.

This paper has 6 (six) pages (excluding this page).

INSTITUTE OF ACTUARIES OF AUSTRALIA

C1 INVESTMENTS **OCTOBER 2010 EXAMINATIONS**

Answer all 5 questions.

QUESTION 1 **(15 Marks)**

You are the Actuary to a superannuation fund to which only the employer contributes (the members of the fund do not contribute). The fund is controlled by a Trustee who is responsible for managing the fund and, in particular, for its investment strategy.

The benefits payable from the fund consist of a defined benefit funded by the employer's contributions which is a multiple of 10% of final salary for each year of membership of the fund. The benefits are defined in a Trust Deed. The Deed provides sufficient information to permit the determination of a member's Vested Benefit (the benefit payable upon voluntary termination of service at a particular time) from the data that the fund holds relating to membership and salary.

The employer's contribution strategy is to pay a constant percentage of employees' salaries over their working lifetimes which, together with the assets available, may be expected to provide all benefits as they become payable. The ongoing monitoring of the fund's financial position includes monitoring this level of contribution.

You may ignore tax and expenses in your consideration of the following:

(a) The employer wishes to minimise the future average contributions paid to the fund, expressed as a percentage of total member salaries, subject to some limit on the variability of these contributions; whereas the trustee of the fund is concerned to maintain the fund's solvency (which is measured in terms of the coverage of Vested Benefits by fund assets) as far as is possible. The ratio of the market value of fund assets to the fund's total Vested Benefits may be referred to as the Vested Benefits Index (VBI).

What investment objectives would you recommend to match these requirements? (3 Marks)

(b) Outline how you would develop and use a stochastic asset-liability model to examine the feasibility of achieving the investment objectives that you have suggested in (a) above. Where appropriate, briefly explain how a particular feature relates to the investment objectives. (5 Marks)

(c) Explain how your model could be used on an ongoing basis to monitor the fund's financial position and to develop recommended adjustments to the fund's asset allocation? (5 Marks)

(d) It has been proposed that the employer's contribution be reviewed every three years. How would this strategy affect your answers to (b) and (c) above? (2 Marks)

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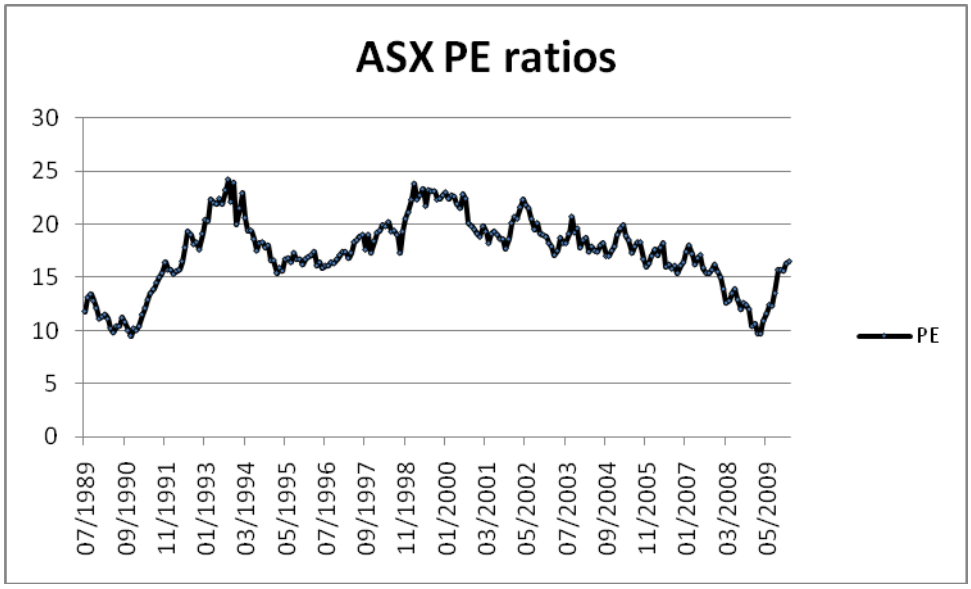
QUESTION 2 **(18 Marks)**

The PE ratio (price to earnings ratio) can be calculated for individual stocks or for entire markets. The chart below shows the PE ratio for the ASX All Ordinaries Index, as calculated by Datastream.



(a) Explain how the PE ratio of an equity index may be calculated. Discuss the stationarity of this ratio and the significance of its level at any particular time for the determination of expected returns from investment in that index at that time. **(3 Marks)**

(b) Define the Equity Risk Premium (ERP) and explain how it is related to the PE ratio. **(5 Marks)**

(c) The Global Financial Crisis (GFC) was a period during which market behaviour diverged significantly from usual norms. For each of the following five specific aspects, state what happened during the GFC and outline the implications of this experience for the future construction and use of asset models.

1. **Cross-country equity correlations**
2. **The relationship between equity and currency returns (if you wish you may consider Australia as a specific example of this)**
3. **The relationship between bond and equity returns**
4. **The effect of fiscal stimulus**
5. **The implied level of credit risk of sovereign bonds**

(10 Marks)

QUESTION 3 **(25 Marks)**

(a) What are the possible causes of consumer price inflation? (4 Marks)

(b) What is the framework within which the Reserve Bank of Australia conducts monetary policy and what tools does it use? (4 Marks)

(c) Describe how the following asset classes can operate as hedges against inflation:
- **infrastructure,**
- **inflation-linked bonds, and**
- **floating rate nominal bonds.**

(3 Marks)

(d) List two other asset classes you might consider as suitable candidates for inflation hedging, providing reasons for your choices. (4 Marks)

(e) In fixed interest management, the break-even inflation rate is the rate that makes the implied real yield on nominal fixed rate bonds equal to the real yield available on inflation linked bonds.

What implications does the break-even inflation rate have for the relative attractiveness of nominal bonds versus inflation-linked bonds?
Are these implications uniform for all nominal and inflation-linked bonds?
(3 Marks)

(f) Name two theories that attempt to explain the relative level of currencies, and briefly explain the role that inflation may have, if any, in the two theories.
(4 Marks)

(g) There is a relative shortage of inflation-linked bonds available in Australia. It has been suggested that global TIPS (Treasury inflation-protected securities) could be used as suitable proxies for funds aimed at Australian retirees. What issues would these funds need to take into account before using global TIPS in this way? (3 Marks)

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QUESTION 4 **(16 Marks)**

Your brother is a member of an Australian defined contribution superannuation fund. He is currently in the Fund's default offering (which is also the Fund's Aggressive option). Legislation has been introduced to require all funds to change their default offering to a low cost fund within the next 12 months. The Fund has contacted him with an outline of its planned new offering. (See below for a summary of the two offerings.) He has been advised that, should he not indicate a preference between the two offerings, he will be moved into the new default offering as required by the legislation. A telephone intra-fund advice service will be available that will provide more detail on differences between the two offerings but will be unable to recommend which fund he should choose. He has come to you for advice. Assume you have the necessary financial planning licence that entitles you to provide such advice.

Strategic Asset Allocation (SAA)	**Current Default**	**New Default**
Australian listed shares	25%	30%
Australian direct property	5%	
International* listed shares	5%	35%
International direct property	10%	
International * REITS		5%
International listed infrastructure		5%
International unlisted infrastructure	10%	
International hedge funds	10%	
International private equity	10%	
Growth	***75%***	***75%***
Australian fixed interest**	5%	10%
International fixed interest**	5%	5%
International inflation linked bonds**	5%	5%
Global credit	5%	
Cash	5%	5%
Defensive	***25%***	***25%***
Total	**100%**	**100%**

* International means ex-Australia. **Government and Government equivalent.

The new default will be invested entirely in indexed funds whereas all exposures are actively managed in the current default and the hedge funds exposure is all in hedge funds that use a global macro strategy. Both defaults will be managed to the SAA within a rebalancing tolerance.

Foreign currency exposures are unhedged for growth assets and 100% hedged back to the Australian dollar for fixed interest (including credit).

(a) Discuss the differences in strategic asset allocation and management style for the two offerings (i.e. current default and new default). Explain the implications of these differences for investment returns in the future. (Ignore, for this part, any implications that arise from a significant number of members ending up in the new default offering). (7 Marks)

(b) Of the current total membership, 10% chose the Aggressive Option and 70% made no choice so defaulted to the Aggressive Option giving a total of 80% of the total membership in the Aggressive Option. The Fund's management is considering the implications of similar percentages moving to the new default offering i.e. the low cost fund. If necessary, the Fund's management may contact the regulator for special consideration (which is allowed under the new legislation).

What might these implications be and what sort of special consideration leeway would you anticipate the fund requesting? (9 Marks)

QUESTION 5 **(26 Marks)**

You are an investment advisor to the Board of Trustees of a defined benefit superannuation fund for workers in an Australian retailer. There are 12,000 members in this superannuation fund between the ages of 18 to 40 years. The fund has $400 million of assets under management. The fund only invests in equities, bank bills of up to 12 months maturity and cash. Currently the assets are split into 40% in actively managed Australian equities, 30% in bank bills and 30% in cash. The assets are managed by one fund manager. The Board believes the portfolio is currently too conservative in its risk-return profile relative to the Board's asset allocation policy.

However, the current global climate is making it difficult to identify suitable value stocks to add into the portfolio. The recent full-year reporting season in August was marked by most companies reporting higher statutory profit, but with lower revenue figures. In other words, companies have made higher profit due to cost-cutting, rather than business growth.

You are now drafting a report for the Board of Trustees as part of the periodic review of the fund's current investment position and to devise a strategy for the upcoming year. You have access to a recent actuarial report by the fund's Actuary into the liabilities and contribution rate for the fund.

(a) Explain how you would assess the superannuation fund's investment performance. (6 Marks)

(b) Explain how the current climate described above of "companies reporting higher statutory profit, but with lower revenue figures" may give rise to stocks which meet the quantitative characteristics of value stocks without being a value stock for investment purposes. Ensure your answer specifies the key quantitative characteristics of value stocks. (4 Marks)

(c) You have identified a small sample of stocks fitting the key quantitative characteristics of value stocks. You are now conducting further research into these companies. Give five items you would investigate further to determine whether to include these companies into the portfolio, with a reason as to how each item of information is relevant. (10 Marks)

(d) Explain three key factors you would consider in managing the portfolio in the coming twelve months in order to specifically meet the fund's long-term objectives as suggested in (a) above. (6 Marks)

END OF PAPER

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