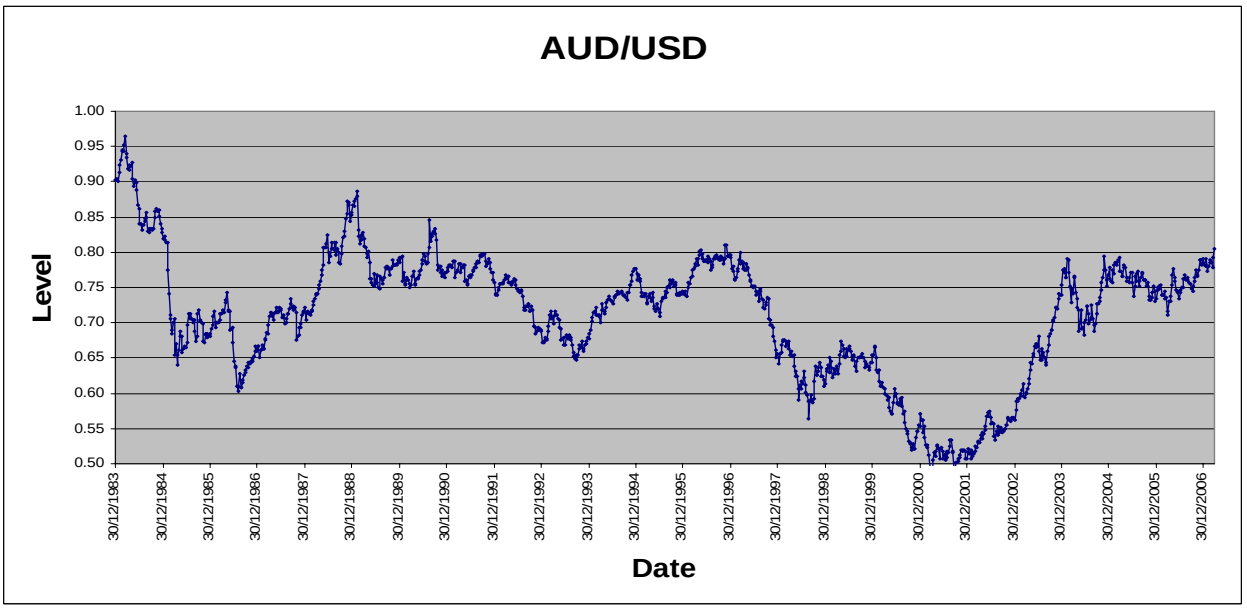
INSTITUTE OF ACTUARIES OF AUSTRALIA

COURSE 1 INVESTMENTS **MAY 2007 EXAMINATIONS**

Answer all 5 questions.

QUESTION 1 **(20 marks)**

One of the risks with overseas investments is currency. The Australian dollar (AUD) has in recent months performed strongly against other major currencies. A chart of its progress against the US dollar (USD) since it was floated in 1983 is as follows:



(a) Suggest reasons for the recent strength of the AUD. (3 marks)

(b) Discuss the impact of the AUD strength for investment in Australia and overseas by Australian institutional investors, assuming no currency hedging. (2 marks)

(c) Discuss the feasibility of forecasting short-term currency movements by means of forward exchange rates. (3 marks)

(d) There are various ways of hedging currency risk. List the benefits and limitations of 3 ways of doing so. (3 marks)

(e) Discuss the factors you would consider in adopting a policy of hedging of overseas investments in developed economies for an Australian investor. (5 marks)

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(f) Discuss whether your factors in (e) would be different when hedging investments in emerging economies. (4 marks)

QUESTION 2 **(20 marks)**

Infrastructure as an asset class is sometimes defined as the basic physical systems of a country's or community's population, including roads, utilities, water, sewage, etc. These systems are considered essential for enabling productivity in the economy and as such are often subject to government regulation. Developing infrastructure often requires large initial investment but the economies of scale tend to be significant.

You are a promoter of infrastructure investments and have been asked several questions by your audience at a recent presentation.

(a) Suggest with reasons the types of investors generally who would (or should) be interested in direct infrastructure investment and provide one specific example. (1½ marks)

(b) Suggest 3 less tangible forms of infrastructure that are necessary in modern times. (1½ marks)

(c) Discuss the nature of infrastructure as an asset class compared to the traditional asset classes of equity and debt and illustrate the characteristics that are not common to the traditional asset classes. (5 marks)

(d) In light of your discussion in (c), suggest an appropriate basis for the expected return and volatility of infrastructure investments that may be used in asset modelling. (4 marks)

(e) Discuss the practical difficulties of investing in infrastructure and how you would approach the resulting issues. (4 marks)

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(f) Discuss ways in which unlisted infrastructure investments may be valued as part of an overall portfolio. (4 marks)

QUESTION 3 **(20 marks)**

A *real option* is defined as

"… the right but not the obligation to undertake some business decision, typically the option to make a capital investment. This kind of option is not a derivative instrument but an actual tangible option (in the sense of "choice") that a business may gain by undertaking certain endeavours."

You are the CFO of a small listed oil exploration company in Australia. A key asset of your company is an offshore lease. Preliminary exploration has given you a probability distribution of oil reserves for the lease.

You have a decision to make as to whether to construct an exploration well on the lease site. Construction of such a well would:

- Involve a known cost, related to CPI
- Provide information to refine the distribution of oil reserves.

At current oil prices, however, it is not economic to construct such a well but it may be feasible to do so in future.

(a) Suggest two examples from investments or insurance where similar real options may arise. (2 marks)

(b) Discuss an objective for the oil company in managing the lease and any constraints that may apply in practice. (3 marks)

(c) Discuss the variables and the form of the asset model that you would adopt in managing the lease. (6 marks)

(d) Outline how you would apply the asset model to value the lease at the present time. (5 marks)

(e) Discuss the complications and the differences from (d) that would arise if there were two possible sites for exploration wells on the lease, each with a known exploration cost. Assume that you have a joint probability distribution of oil reserves for the two sites and that an exploration well for one site provides further information on the reserves of both sites.

(4 marks)

QUESTION 4 **(20 marks)**

As an adviser in property (real estate) investment, one of your main skills is in the assessment of property managers. However the property universe is vast and there is a plethora of different property vehicles that can be used by retail or wholesale investors. In marketing your services to clients, you have found it necessary to explain several key issues with the work that you do.

Design a brochure for clients dealing with the following issues:

(a) The main vehicles that can be used for property investment and their strengths. (4 marks)

(b) The desirable characteristics that you would seek in a property manager. (4½ marks)

(c) A general process that you would adopt for assessing the management skills of individual property managers. (4 marks)

(d) How management expertise is reflected in the returns available to investors for both listed and unlisted property. (3 marks)

(e) 3 methods for benchmarking the performance of selected property managers and the benefits and limitations of each method. (4½ marks)

QUESTION 5 **(20 marks)**

As the financial controller of a large grain marketing firm that operates worldwide, you are vitally interested in the return delivered to grain growers as a result of your firm's operations. You see some analogies between your firm's activities and those of an investment manager and are keen to exploit the similarities.

Your firm does not trade in grain on its own account but acts as the agent of grain growers. Your firm arranges three main services for growers:

- the storage and delivery of grain from growers;
- the sale of grain on world markets, including price hedging; and
- foreign exchange of the proceeds including currency hedging.

In return, your firm earns commission from growers, based on the return available to growers relative to a performance benchmark.

Growers can choose to sell their grain into one or more pools operated by your firm. Each pool is operated as a single trust fund and provides a uniform return to growers, taking account only of the source and grade of grain delivered.

Your firm is concerned with remaining competitive with other means of sale but also with its profitability. Growers are concerned with predictability of return.

(a) Discuss the merits to growers of selling grain under an agency framework as described above compared to selling direct. (2 marks)

(b) Describe 3 ways in which the firm can add value for growers. (3 marks)

(c) For each of the ways in (b), discuss the basis of an appropriate performance benchmark, having regard to your firm's concerns. (6 marks)

(d) Discuss appropriate constraints that may be imposed on your firm's operations in the interests of growers and how these might affect your response to (c). (3 marks)

(e) Discuss a suitable basis for your firm's remuneration, in light of performance fees available generally to investment managers. (3 marks)

(f) Discuss what risk controls you would adopt for your firm's operations in its three main areas of operation. (3 marks)

END OF PAPER

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