THE INSTITUTE OF ACTUARIES OF AUSTRALIA

INVESTMENT MANAGEMENT **2004 EXAMINATIONS**
EXAM SOLUTIONS **PAPER TWO**

QUESTION 1 **(20 Marks)**

Use by superannuation funds of so-called 'alternative investments' has been gradually increasing in the past decade in general and the last 3 years in particular.

(a) Explain why alternative investments are becoming more popular and the general factors that need to be considered before an investment of this type is made.

(4 marks)

(b) In relation to the alternative investments listed below, explain the potential advantages and disadvantages and the key features of each type that would need to be considered before proceeding with an investment.

(i) Private equity. **(4 marks)**

(ii) Infrastructure. **(4 marks)**

(iii) Hedge funds. **(4 marks)**

(c) List and explain the items that should be considered in determining an appropriate allocation to alternative investments. The items considered should be different to those considered in determining allocations to more traditional investments. How would you determine an appropriate allocation to alternative investments in an overall portfolio? **(4 marks)**

QUESTION 1: SOLUTION **(20 marks)**

(a)

Reasons why alternative investments are becoming more popular:

- Key concepts that answers should include: DIVERSIFICATION, risk control and importance of understanding nature of vehicle given heterogeneity and non traditional risks.
- Potentially offer better risk/return trade-off, partially as a result of lower observed correlation with major asset classes (however, this better outcome has not always been delivered in practice!).
- Poor returns from equity markets, particularly global equities over the period 2000 -2002.
- General expectation of lower returns from traditional markets for the next decade.
- Looking for diversity of return from traditional markets.
- Desire for more of portfolio return to be generated by 'alpha' (active return above benchmarks) versus 'beta' (market exposure alone). This can be provided by some alternatives (e.g. hedge funds).
- Desire for funds to be seen to be more 'innovative' (i.e. competitive pressures).

(½ mark each point subject to a maximum of 2 marks.)
General factors to consider:

- Lack of liquidity in many cases (not suitable for particular liability streams, not suitable for closed/shrinking funds).
- Lack of regularly available/transparent pricing (causes problems for unit pricing and equity between members entering and exiting).
- High levels of fees.
- Complex tax and legal structures in many cases.
- Lack of transparency in investment process in some cases (e.g. hedge funds not being prepared to outline their processes and/or portfolio holdings). This makes such investments harder to research.
- Capacity limitations and access to capacity. Alternatives generally suffer from limited capacity or availability and accessing the best managers can be difficult. Too much client desire either pushes prices up (reducing the point of investing in alternatives) or leads managers to charge very high fees.
- Delays in ultimate delivery of returns in many cases, particularly for 'early stage' companies/projects in private equity or infrastructure. That is, returns can be 'back ended', which can cause intergenerational equity issues between fund members.

(½ mark for each point, subject to a maximum of 2 marks)

(b)

(i)

<u>Private Equity</u>

Advantages:

- Access to small fast growing businesses.
- Access to opportunities not generally available on the listed market.
- Nature of valuations tends to smooth returns (even if this is somewhat 'artificial').
- Historical returns at least have generally been attractive over the long term.

Disadvantages:

- Generally takes a long time to get invested.
- A lot of money currently queued up to invest in sector (i.e. delays will be even longer than usual).
- Takes a long time to have meaningful effect on performance – slow delivery of returns provides intergenerational equity issues (the so-called 'j-curve' effect).
- Lack of liquidity.
- Valuation process can be quite subjective.
- Ultimately correlated to some degree with the equity market (as many of the investments are exited via an IPO).

Other features to consider:

- Covers a wide range of risk/return spectrum from high risk (venture, 'early stage'), to lower risk (MBO, expansion finance). Need to consider which stage is appropriate for client.
- Want diversification across managers/investments and particularly 'vintage years'.
- May need to commit more than actual desired holding in order to actually achieve the desired holding (given commitments are only 'drawn' over time).

(½ mark for each point. Minimum of 1 mark required for each of advantages, disadvantages and other factors. Maximum total of 4 marks.)

(ii)

Infrastructure

Advantages:

- Useful asset diversifier.
- 'Real' asset nature is appealing (i.e. Trustees and members can typically relate to the assets in question).
- Nature of assets is such that returns tend to be relatively stable.
- Returns often linked to inflation (or margin above). Useful for matching inflation linked liabilities.

Disadvantages:

- Lack of diversification (tends to be 'lumpy', like direct property). Even infrastructure funds tend to hold only a handful of investments.
- Lack of liquidity.
- Suitable deal flow (in Australia) now questionable (many of the large government privatisations have already occurred).
- Early on returns were attractive, but deals are now much more competitive and thus offer lower potential returns.

Other features to consider:

- Need to tailor exposure between more risky (infrastructure equity, new or incomplete projects) and less risky (established projects, exposure taken via debt) to needs of client.
- Projects also tend to vary widely by sector and also by level of government regulation. Prefer a diversified exposure if this can be obtained.
- Investment opportunities in this sector tend to be episodic – i.e. they occur in groups dictated by factors such as government privatisations of particular sectors.

(½ mark for each point. Minimum of 1 mark required for each of advantages, disadvantages and other factors. Maximum total of 4 marks.)

(iii)

Hedge Funds

Advantages:

- Returns generally based on manager skill rather than market exposure. Thus provides good diversification benefits (lowly correlated to traditional market exposures).
- Even allowing for the limitations of historical performance data for hedge funds, risk/return results appear to have been attractive.
- End members/clients are more focused on absolute returns in recent years.
- Hedge funds tend to produce outcomes that better match client preferences.

Disadvantages:

- Tend to be expensive.
- Capacity is limited and access to capacity can be difficult.
- Transparency of investment process can be poor.
- Lower liquidity than listed investments, but generally significantly better than private equity or infrastructure (e.g. many funds offer monthly liquidity).
- Legal/tax structures can be complex (and offshore).

Other features to consider:

- More than any other type of alternative investment, hedge funds are a very heterogeneous group. That is, the general term describes a very wide range of different activities and different risk levels.
- Prefer a more diversified exposure to reduce the risk of individual hedge fund failures.
- Alpha rather than beta exposure.
- Note restrictions on short selling for some investors (eg super funds)

(½ mark for each point. Minimum of 1 mark required for each of advantages, disadvantages and other factors. Maximum total of 4 marks.)

(c)

Answer MUST include the limitations of traditional mean variance optimiser due to nature of data to pass 'cut off'.

A typical process for determining general asset mixes may combine elements of the following:

- Mean/variance optimisation (deterministic asset model).
- Stochastic modelling (to 'stress test' a portfolio under different assumptions and economic conditions and provide a 'range' of possible outcomes).
- Asset/liability model – typically for a defined benefit fund where close matching of assets and liabilities has been identified as a key issue.
- Assessment of medium/long term valuation levels/structural issues for major asset classes.
- Need additional reasonableness qualitative judgement and incorporation of liquidity projection and cashflow requirements.
- How to include performance based fees in modelling?

(Bonus ½ mark for attempting to state any of the above background elements.)

Issues to consider for alternative investments that are likely to differ from issues arising for more traditional investments:

- Data issues make alternative assets hard to evaluate in a traditional 'mean/variance optimisation' process.
- Limited returns history in many cases.
- Illiquidity / infrequent valuations cause serial correlation in returns (thus rendering the results of mean/variance optimisation questionable).
- Survivorship bias in returns (e.g. some hedge fund indices).
- In some cases (e.g. hedge funds generally, notwithstanding the above), the results can be that good that the optimiser would place 50% of the portfolio in them, which is not realistic from a practical perspective.
- Lack of liquidity of many alternative investments may be a problem (may need to limit exposure to an acceptable level).
- Higher cost of alternatives may not be acceptable to client (may need to limit alternative exposure to an acceptable level).
- Need to consider what alternative opportunities are actually available (no point in setting an allocation that will never be achieved in practice).

(½ mark for each point to a maximum of 2 marks.)

General approach to allocating to alternative assets:

(In essence, students need to provide a sensible answer and emphasise that practical issues will dominate theoretical considerations when setting allocations. Some points that could be made are listed below)

- If returns history is available and of sufficient quality, then use this as part of the process for setting sensible future assumptions.
- If not, look to 'similar' assets or the nature of the investment to determine sensible return assumptions (e.g. depending on type, infrastructure risk/return should sit somewhere between bonds and equities, but with possible additional return for illiquidity).
- Consider common sense allocations. Start small and increase over time as knowledge/experience increases.

- Consider the opportunities actually available.
- Build alternative portfolio allocation to some degree 'by hand', but check affect on overall portfolio using 'reasonable' assumptions.
- Need to accept that when assets in question are relatively unrecognised (and thus underpriced), insufficient data is available to build 'robust' model. Thus with virtually all alternative investments, some 'leap of faith' is required.

(½ mark for each point to a maximum of 2 marks. Note, there is no perfect answer to this question.)

QUESTION 2 **(16 Marks)**

You are a securities analyst at a funds management organisation. Your current task is to look at two recently listed Australian companies that both operate in the child care sector. Summary profit and loss statements and balance sheets for each company are set out below.

All numbers are in $A millions unless otherwise stated.

Company A

Year to June	**1999**	**2000**	**2001**	**2002**	**2003**
Revenue	2,000	2,160	2,311	2,450	2,572
Operating expenses	1,300	1,382	1,456	1,519	1,569
EBITDA	**700**	**778**	**855**	**931**	**1,003**
Interest payable	-210	-210	-210	-210	-210
Depreciation	-200	-200	-200	-200	-200
NPBT	**290**	**368**	**445**	**521**	**593**
Tax	-87	-110	-133	-156	-178
NPAT	**203**	**257**	**312**	**365**	**415**
Shares on issue (millions)	1,000	1,000	1,000	1,000	1,000
Earnings per share ($)	**0.20**	**0.26**	**0.31**	**0.36**	**0.42**
Dividends per share ($)	**0.14**	**0.18**	**0.22**	**0.26**	**0.29**
Franking	100%	100%	100%	100%	100%
Assets	6,000	6,077	6,171	6,280	6,405
Senior debt	3,000	3,000	3,000	3,000	3,000
Other liabilities	500	500	500	500	500
Equity	**2,500**	**2,577**	**2,671**	**2,780**	**2,905**

Company B

Year to June	**1999**	**2000**	**2001**	**2002**	**2003**
Revenue	300	345	397	456	525
Operating expenses	285	311	337	365	394
EBITDA	**15**	**35**	**60**	**91**	**131**
Interest payable	-14	-15	-17	-18	-20
Depreciation	-20	-25	-30	-35	-40
NPBT	**-19**	**-5**	**13**	**38**	**71**
Tax	6	1	-4	-11	-21
NPAT	**-13**	**-4**	**9**	**27**	**50**

Shares on issue (millions)	1,000	1,000	1,000	1,000	1,000
Earnings per share ($)	**-0.01**	**0.00**	**0.01**	**0.03**	**0.05**
Dividends per share ($)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Franking	n/a	n/a	n/a	n/a	n/a
Assets	1,300	1,326	1,366	1,425	1,508
Senior debt	200	220	240	260	280
Other liabilities	100	110	121	133	146
Equity	**1,000**	**996**	**1,005**	**1,032**	**1,081**

(a) What sort of investigation/analysis would you carry out to determine whether the child care sector as a whole is suitable/appealing from an investment perspective? What sort of structural characteristics would you be looking for in the industry? (4 marks)

(b) From a financial perspective, what do you see as the key differences between the companies? Provide calculations and observations in this regard. What additional financial information would you seek? (6 marks)

(c) Your economist is of the view that we are about to enter a period of higher domestic inflation and rising interest rates. How would this impact on your view of the child care industry:

(i) as a whole, and (2 marks)

(ii) the relative appeal of the companies? (4 marks)

QUESTION 2: SOLUTION (16 marks)

(a)

Types of investigation/analysis to carry out:

- ABS data
- Child care industry bodies and associated data sources
- Regulatory issues / tax treatments etc
- Industry and company data from overseas child care market of similar or greater maturity (eg. the US, the UK, some European markets)
- Government statistics/treasury projections / etc
- Demographic information/workforce stats/miscellaneous socio-economic data
- List of players in the industry, their ownership structures, market shares, historical financial information, growth strategies, etc

Structural characteristics to look for in the industry:

- The threat of entry by new competitors/barriers to entry.
- The intensity of rivalry among existing competitors.

- Pressure from substitute products.
- The bargaining power of buyers.
- The bargaining power of suppliers.
- Degree of market share concentration / fragmentation.
- Regulatory risk.
- Growth potential.
- Capital intensity vs return on capital.
- Degree of price competition / elasticity.
- Margins (size and stability).
- Sensitivity to economic conditions.

(2 marks total for types of analysis (½ mark each point), ditto for structural characteristics. Maximum of 4 marks)

(b)

Calculation results for both companies are detailed below.

Company A	1999	2000	2001	2002	2003
Revenue growth		8.0%	7.0%	6.0%	5.0%
EBITDA growth		11.1%	10.0%	8.9%	7.8%
NPAT growth		26.8%	21.1%	17.0%	13.9%
EBITDA margin	35%	36%	37%	38%	39%
EBITDA/interest	3.3X	3.7X	4.1X	4.4X	4.8X
Effective tax rate	30%	30%	30%	30%	30%
Dividend payout ratio	70%	70%	70%	70%	70%
Gearing: Debt/Equity	120%	116%	112%	108%	103%
Gearing: Debt/(Debt + Equity)	55%	54%	53%	52%	51%
ROE	8.1%	10.0%	11.7%	13.1%	14.3%

Company B	1999	2000	2001	2002	2003
Revenue growth		15.0%	15.0%	15.0%	15.0%
EBITDA growth		130.0%	72.5%	53.3%	43.8%
NPAT growth		-68.9%	nm	199.3%	88.1%
EBITDA margin	5%	10%	15%	20%	25%
EBITDA/interest	1.1X	2.2X	3.5X	5.0X	6.7X
Effective tax rate	30%	30%	30%	30%	30%
Dividend payout ratio	0%	0%	0%	0%	0%
Gearing: Debt/Equity	20%	22%	24%	25%	26%
Gearing: Debt/(Debt + Equity)	17%	18%	19%	20%	21%
ROE	-1.3%	-0.4%	0.9%	2.6%	4.6%

Observations

Company A is considerably larger in terms of absolute levels of revenue, assets and profit. It also has materially higher profit margins and return on capital. It has still been able to achieve steady (if modest) margin expansion.

Company B has been experiencing much higher top line and bottom line growth. Its margins have been expanding more rapidly (although, as mentioned above, they remain far lower in absolute terms).

Company A has higher gearing, but still has better interest cover than Company B (due to its superior margins). Company B is less geared, but it is apparent that it has been raising its gearing to help drive its strong growth rate.

No difference in effective tax rate.

Company A has a healthy dividend payout ratio, whereas Company B is retaining all of its earnings

Additional financial information to seek

- Capital expenditure (development vs maintenance).
- Level of goodwill / other intangibles (including capitalised expenditure).
- More details on revenue breakup
- More details on expense breakup (esp. fixed versus variable, recurring vs development / one off)
- Cash flow statements
- Franking balances
- Current share price and share price history
- Index weighting
- Liquidity
- Details of the share registers

(½ mark for each calculation, ½ mark for accompanying comments (up to 4 marks), ½ mark for each piece of additional information. 2 marks in total)

(c)

(i)

Implications for the industry as a whole:

- Higher inflation is generally reflective of higher economic growth.
- To the extent this leads to higher employment and/or greater prosperity, could lead to greater demand for child care services.
- The tradeoff is that, if prosperity rises beyond a certain point, people can begin to afford nannies/one partner can stop working etc.

- Higher inflation will likely also translate into higher expenses, so the companies will need to achieve price increases to maintain margins.
- This should be possible given the comments above re prosperity (and because demand elasticity to changes in price should be modest).
- On the other hand, from a stockmarket perspective, the industry may be perceived as less leveraged to a stronger economy than some other sectors.

(½ mark for each. Maximum of 2 marks.)

(ii)

Implications for the companies:

Company A

- Relatively stable, mature business
- So, provided it can get its pricing up to cover expense inflation and higher borrowing costs, its fundamentals should not be hugely affected
- Having said this, it could be viewed by the market as being a relatively boring/ defensive play on the strengthening economy
- The tradeoff depends on the market's view on how much demand for child care services will pick up (see above)
- Consistent with the broader market, its dividend yield (at current prices) will become less compelling vs interest rate levels

Company B

- As with Company A, will probably need to get its pricing up to cover expense inflation and higher borrowing costs
- Although its lower margins give it less margin for error
- While it has lower gearing than Company A, it still has lower interest cover (again due to its lower margins)
- It therefore appears somewhat more vulnerable to the change in economic conditions
- Coming off a lower base and with what appears to be a greater growth orientation, it could find more growth opportunities
- However, the cost of borrowing to fund further expansion will also rise (implying a higher hurdle rate for new initiatives)
- Finally, given its more modest size, it may not have as much pricing power as Company A (although hard to tell on available information)

(½ mark for each. Maximum of 6 marks.)

QUESTION 3 **(20 Marks)**

You are a consultant working in an Australian consulting firm. You are responsible for managing a number of portfolios for some local superannuation funds.

It is now 12th May 2003, a day before the monthly reports are due to be delivered to your clients. A new junior consultant, John, has been working very hard in checking the accuracy of the monthly reports. In doing so, John came across the following table of data:

Index	Monthly Performance for the month of April 2003
MSCI World ex Australia Net Index (in AUD)	5.18%
MSCI World ex Australia Net Index (in local currency terms)	8.35%
MSCI World ex Australia Net Index (Fully Hedged into AUD)	8.38%

John made the following comment:

> **"There must be something wrong with our system. It has been pulling down the wrong data. Look at the table. While I understand that the difference in performance between the unhedged and the local is probably due to the surge in the Australian dollar, the difference between the local and the hedged is simply too small. It had been around 30 basis points for the past 3 months."**

(a) What is the MSCI World ex Australia Net Index? Explain briefly the major differences between the three indices quoted in John's table.

(4 marks)

Index	Monthly Performance for the month of		
	Jan 2003	Feb 2003	Mar 2003
MSCI World ex Australia Net Index (in AUD)	-6.96%	-5.10%	0.01%
MSCI World ex Australia Net Index (in local currency terms)	-3.68%	-1.57%	-0.64%
MSCI World ex Australia Net Index (Fully Hedged into AUD)	-3.34%	-1.29%	-0.37%

Currency	MSCI World ex Australia's Top 6 Currencies Exposure	Forward FX Rate at 31/3/03 (Foreign Currency/AUD)	Spot FX Rate (Foreign Currency/AUD)	
			31/3/03	30/4/03
US Dollar	59%	0.6026	0.6044	0.6264
Euro	15%	0.5528	0.5538	0.5605
UK Pound	12%	0.3819	0.3823	0.3914
Japanese Yen	9%	71.1100	71.6600	74.6900
Swiss Franc	3%	0.8139	0.8167	0.8495
Canadian Dollar	2%	0.8865	0.8890	0.8986

(b) Given the above information, do you agree or disagree with John's assertion that "the difference in performance between the unhedged [index] and the local [index] is probably due to the surge in AUD"? Why, or why not?

(6 marks)

(c) The transactions assumed by MSCI in calculating the hedged return of investing in a security are:

> ***An investor enters into a spot transaction to purchase a nominal amount of the foreign currency in which the security is denominated. The proceeds of this transaction are then invested in the security for the period. Simultaneously, a forward currency transaction is entered into, selling the amount of foreign currency purchased back into the investor's home currency. At the end of the reporting period, the investment into the security is redeemed for cash, the proceeds of which are used to settle the forward currency transaction. Any surplus or shortfall to the amount of currency sold forward is met by entering into a spot transaction.***

Using the following notations and/or the above information, derive a formula which links the local return of a security (say in USD) with the hedged return of a security in AUD according to MSCI.

RL = Return earned in local currency
RH = Hedged Return earned in AUD
FX(t) = Spot FX rate (foreign currency/AUD) at time t
FF (t) = Forward FX rate (foreign currency/AUD) at time t

(6 marks)

(d) Given the information in <u>part (c)</u>, do you agree or disagree with John's assertion that "the difference (in performance) between the local [index] and the hedged [index] is simply too small"? Why, or why not?

(4 marks)

QUESTION 3: SOLUTION **(20 marks)**

(a)

The MSCI World ex-Australia Net Index is a free float-adjusted market capitalisation index that is designed to measure the world's major developed market equity performance (excluding Australia).

It is a total return index that measures the market performance including both price performance and income from dividend payments. Its methodology assumes that dividends are reinvested in the index the day the security is quoted ex-dividend. Being a 'Net' index, it approximates the minimum possible dividend reinvestment. The dividend is reinvested after deduction of withholding tax, applying the rate to non-resident individuals who do not benefit from double taxation treaties. MSCI uses withholding tax rates applicable to Luxembourg holding companies, as Luxembourg applies the highest rates.

The major difference between the normal/unhedged index (ie the performance is expressed in AUD) and the 'local' index (i.e. the performance is expressed in the local currency terms) is that fluctuations of AUD against other developed countries'

currencies form part of the return to the normal index. The return to the normal (or unhedged) index is equal to the return of the 'local' index plus the 'return' of the spot AUD during the month. The local index is an 'artificial' index in a sense that investors in Australia cannot invest in a portfolio that can replicate that return (unless the portfolio manager can hedge each portion of his/her portfolio at the spot rate at any given point in time at no cost). To protect the investment from currency fluctuations, an investor needs to invest in a manner similar to the assumed transactions that underlies the Hedged index.

The (currency) Hedged index represents the performance of an index of securities where currency exposures affecting index principal are hedged against a specified currency (in our case, AUD). It approximates the return that can be achieved by hedging the currency exposures of the index in the one-month forward market at each month-end. The return to the Hedged index differs from the normal/unhedged return as it not only captures the performance of international equity markets, but also neutralise (majority) of currency fluctuations on the AUD and hence is suitable for investors who are concerned with the effects of currency fluctuations.

The return to the Hedged index differs from the 'local' return due to the transaction costs incurred in hedging. The performance of a hedged index reflects the true impact of currency hedging activities. In other words, the return difference between a Hedged index and a 'local' index is the sum of the premium/discount of the forward FX rates compared to the spot FX rate (ie the interest rate differentials between Australia and other developed countries) and the spot rate effect on the unhedged exposure of the index due to market movement.

(1 mark for 'What does the MSCI benchmark measure?', then 1 mark each for differences between unhedged and local, local and hedged, unhedged and hedged, up to 3 marks. 4 marks in total)

(b)

Yes, I agree with John's assertion.
Using the notation that
RL_i = Return earned on security i in local currency
RU_i = Unhedged Return on security i earned in AUD
$FX(t)_i$ = Spot FX rate (foreign currency/AUD) at time t for security i's local currency

Then $RU_i = [(1+RL_i)* FX_i(0)/FX_i(1)] - 1 = RL_i + (1+RL_i)*[FX_i(0)/FX_i(1) -1]$

On aggregate,

Unhedged Index Return = $RL + \sum_c \text{Weight}_c * (1+RL_c)*[FX_c(0)/FX_c(1) -1]$

where
Weight_c = combined exposure/weight of currency c in MSCI World Index ex Aust
RL_c = combined weighted average return for those securities denominated in currency c
$FX_c(t)$ = Spot FX rate (foreign currency/AUD) at time t for currency c

Assuming that the cross-sectional variations in country/currency returns and the magnitude of country/currency returns are small relative to the weight/exposure of individual country/currency, the difference between the Unhedged Index return and the 'Local' Index return can be approximated by: [Note: the assumption is reasonable for the month of April 2003 as the majority of the developed markets rise in tandem in response to the end of the Iraq War]

$\sum_c \text{Weight}_c * [FX_c(0)/FX_c(1) - 1]$

Currency	MSCI World ex Australia's Top 6 Currencies Exposure	Spot FX Rate (Foreign Currency/AUD)		FX(0)/FX(1) -1
		31/3/03	30/4/03	
US Dollar	59%	0.6044	0.6264	-3.51%
Euro	15%	0.5538	0.5605	-1.20%
UK Pound	12%	0.3823	0.3914	-2.32%
Japanese Yen	9%	71.66	74.69	-4.06%
Swiss Franc	3%	0.8167	0.8495	-3.86%
Canadian Dollar	2%	0.889	0.8986	-1.07%
				-3.03%

Comparing the weighted average of -3.03% with the actual difference between the normal/unhedged Index and the 'Local' Index of -3.17%, it is reasonable to conclude that "the difference in performance between the unhedged and the local indices is probably due to the surge in AUD".

(An alternative answer to the above is detailed below.)

Students may also base their answer on general reasoning that the weighted average of the increase in AUD value was 3.14% and hence the difference between the 'local' return should be approximately 3.14% higher than the normal/unhedged index if the cross-sectional variations in country/currency returns and the magnitude of country/currency returns are small relative to the weight/exposure of individual country/currency.

The calculations based on appreciation of AUD would be:

Currency	MSCI World ex Australia's Top 6 Currencies Exposure	Spot FX Rate (Foreign Currency/AUD)		FX(1)/FX(0) -1
		31/3/03	30/4/03	
US Dollar	59%	0.6044	0.6264	3.64%
Euro	15%	0.5538	0.5605	1.21%
UK Pound	12%	0.3823	0.3914	2.38%
Japanese Yen	9%	71.66	74.69	4.23%

Swiss Franc	3%	0.8167	0.8495	4.02%
Canadian Dollar	2%	0.889	0.8986	1.08%
				3.14%

(2½ marks for calculations, 2½ marks for general reasoning, 1 mark for why/why not. 6 marks in total)

(c)

Method 1: by general reasoning 1

There are three components to a security's hedged returns:

1. The performance of the unhedged security in the hedged currency (eg in AUD)

2. The "cost" to hedge on the Forward contract

3. The actual gain or loss on the Spot exchange rate

Now, a security's unhedged return is = [(1+RL)* FX (0)/FX (1)] – 1

The 'cost' to hedge on the Forward contract is = FX(0)/FF(0) - 1

The actual gain or loss on the Spot exchange rate is = FX(0)/FX(1) - 1

The hedge impact, expressed in percent, is calculated as the difference between the cost to hedge on the Forward contract and the actual gain or loss on the Spot exchange rate.

That is, Hedge Impact on unhedged return = FX(0)/FF(0) – FX(0)/FX(1)

Hence,

RH = [(1+RL)* FX (0)/FX (1)] – 1 + FX(0)/FF(0) – FX(0)/FX(1)

Or (after re-arranging)

RH = RL + [FX (0)/FF (0) – 1] + RL * [FX(0)/FX(1) -1]

Method 2: by general reasoning 2

Since no adjustment to the hedge is done during the month to account for changes in the indices due to price movement of securities, corporate events, addition, deletions or any other changes, the hedged return can be decomposed into three components:

1. The return earned in local currency, RL

2. The interest rate differential between the local currency and AUD,
   FX(0)/FF(0) – 1

3. The spot rate effect on the unhedged portion of the return due to market movement, corporate events or any other changes to the index,
   RL * [FX(0)/FX(1) -1]

Hence,

RH = RL + [FX (0)/FF(0) – 1] + RL * [FX(0)/FX(1) -1]

Method 3: by following the transactions listed in the question

Suppose an initial investment of AUD Y is invested in a security i, whose local currency is trading at FX(0) at the beginning of the month. The value of the investment is therefore Y * FX(0) in foreign currency.

Assume the total return on the security during the month in local currency is RL, then the value of the investment at the end of the month in is:
Y * FX(0) * (1+RL) in foreign currency, or
Y * FX(0) * (1+RL) / FX(1) in AUD

Hence, the Unhedged return is (1+RL) * FX(0)/ FX(1) - 1

Now, to account for the Forward Currency transaction, it is noted that:
The initial value of the contract, in AUD, was Y * FX(0) / FF(0)
The month-end value of the contract, in AUD, is Y * FX(0) / FX(1)
Therefore, the profit in the Forward transaction is FX(0)/FF(0) – FX(0)/FX(1)

Summing up the returns from the physical trade and the forward contract:

RH = [(1+RL)* FX (0)/FX (1)] – 1 + FX(0)/FF(0) – FX(0)/FX(1)

Note:
Another way to follow the whole transaction is that:

The initial nominal value of the contract in foreign currency was Y * FX(0)
The value of investment at month end in foreign currency is Y * FX(0) * (1+RL).
There is a surplus foreign currency of Y * FX(0) * (1+RL) - Y * FX(0)
= Y * FX(0)*RL, which is not covered by the Forward and needs to be converted using the Spot rate
=> The value of surplus in AUD is Y* RL*FX(0)/FX(1)

The value of foreign currency converted by closing out the Forward is
Y * FX(0)/FF(0)
Therefore, the value of the investment at month end is:
Y * FX(0)/FF(0) + Y* RL*FX(0)/FX(1)

Hence the return RH = FX(0)/FF(0) + RL * (FX(0)/FX(1) -1

Or
RH = RL + FX(0)/FF(0)-1 + RL * [(FX(0)/FX(1) -1]

(2 marks for setting up three components, 2 marks for linking relationships, 2 marks for reasoning. 6 marks in total.)

(d)

I disagree with John's assertion that **"***the difference (in performance) between the local and the hedged indices is simply too small***".**

From the expression derived from c,

RH = RL + FX(0)/FF(0) -1 + RL * [FX(0)/FX(1) -1]

it is clear that the two main components of Hedged return which are in addition to the "local" return are:

1. The premium/discount in forward rate, which represents the interest rate differential between Australia and other developed countries.

2. The spot rate effect on the 'unhedged' exposure due to market movement.

In general, the spot rate effect on the 'unhedged' exposure is generally small as the 'local' returns are generally single digit numbers. Given that the 'local' returns were either negative or close to zero, the spot rate impact on the Hedged return was therefore minor for the first three months of 2003. Since Australia's cash rate was about 3.5% higher than the weighted average of other countries' 'cash' rate, this explains why the differences between the Hedged return and the Local return were around 30bp for each month between Jan and March 2003 .

However, in April 2003, most of the developed market had a good run and hence the 'local' returns became significant in affecting the hedge ratio. In other words, as MSCI assumes a 'hedge and forget' strategy, the 'unhedged' exposure due to market movement became material compared to the actual return.

On a very rough calculation, the AUD appreciates by around 3% during the month and the 'local' returns were on average about 8%, this gives a drop in Hedged performance of about 24bp (compared to a truly fully hedged portfolio). Combining with the 'regular' interest rate differential of about 30bp, this gives a rough estimate of the difference between the Hedged return and Local return to be about 6bp. Comparing this to the actual 3 bp difference, it is reasonable to conclude that the figures are correct.

(1 mark for stating whether in agreement or disagreement with the statement. 3 marks for clear explanation.)

QUESTION 4 **(20 Marks)**

Having heard that 'smaller is better' when it comes to equity investment firms you have decided to follow the recent trend of investment professionals setting up their own equity fund by establishing Big Alpha Boutique Investments (BABI). Having come up with a catchy name, you face many decisions before the funds roll in.

(a) Firstly, you need to consider what type of investment fund you want the BABI fund to be. Assuming you want to be an active, fundamental investor, list your broad options in terms of investment style, including a short explanation of what it means to adopt those styles. (3 marks)

(b) Apart from style, what other parameters/constraints do you need to consider for the fund? (3 marks)

(c) Having decided that your process will involve a very analytical, bottom up approach, you have decided to set out your analytical process for the analysts you plan to hire.

Outline 4 different ways that you can assess the value of an equity investment and describe 2 constraints for each of these methods. (8 marks)

(d) Provide a summarised explanation of how you would go from knowing nothing about an equity investment to coming up with a solid investment recommendation for the portfolio, including sources of information. (6 marks)

QUESTION 4: SOLUTION **(20 marks)**

(a)

Value investing (1 mark) – The process of investing in companies believed to be trading below their intrinsic value. It typically involves investing in companies that are trading on lower than market PE ratios, or price to book ratios, and higher than market dividend yields (1 mark).

Growth investing (1 mark) – Looking for companies that have higher earnings growth rates than the market, and typically trade on higher than market PE ratios and lower than market dividend yields (as capital appreciation is the primary goal). (1 mark).

Style Neutral (1 mark) – applying no style constraint to investment decisions, allowing the fund to outperform in any market environment, dependant entirely on individual stock decisions (1 mark).

Should also accept variants on the above eg 'deep value', 'growth at reasonable price' etc, with full marks for accurate explanations.
(3 marks in total)

(b)

Need to consider:

- Benchmark – what will the benchmark of the fund be
- Tracking error
- Turnover
- Size constraints
- Number of stocks in the portfolio
- Use of derivatives
- Maximum cash balance
- Small cap or large cap
- Ethical fund
- Long/short
- Maximum % ownership at individual company level
- also cover top down vs bottom up investing
- time horizon
- recognise periods in market cycle when style will underperform/do well

(½ mark each, up to a maximum of 3 marks)

(c)

Methods could include:

<u>Discounted Cash Flow (DCF)</u>
- Requires reliance on cash flow forecasts that can be significantly uncertain for certain industries.
- Heavily dependant on discount rate used.
- Terminal value has significant impact.

<u>Price Earnings Ratio (PER)</u>
- Impacted by variances in tax treatment.
- Impacted by variances in gearing.
- Impacted by variances in accounting treatment.
- Does not work for negative earnings/loss making companies.
- Doesn't explicitly take into account future growth or risk.
- Hard to determine what the 'right' PE multiple to use.

<u>Dividend Discount Model (DDM)</u>
- Heavily dependant on discount rate used.
- Heavily dependant on long term growth rate assumed.
- Hard to take account of differences in payout ratio/reinvestment rate.
- Does not work when growth rate > discount rate (ie generally only works for mature companies).

Enterprise Value Multiples (eg EV/EBITDA or EV/EBIT)

- Can be distorted by accounting treatment (both balance sheet and P&L).
- Relies on point in time value of cash and debt on the balance sheet.
- For various industries, ignoring gearing may not tell the whole story.
- Doesn't explicitly take into account future growth or risk.
- Ignores cashflow items such as tax, interest and capex.
- Hard to determine what the 'right' multiple to use for different industries.

Balance Sheet Multiples (eg Price to Book Value or NTA)

- Direct reliance on the accuracy of the balance sheet.
- Comparisons can be difficult due to variances in accounting treatment.
- Doesn't explicitly take into account future growth or risk.
- Hard to determine what the 'right' multiple to use for different industries.

Will also accept other commonly used methods eg Cash flow multiples.

(1 mark each for the method (up to 4 marks) and ½ mark each for constraints (up to one mark per method). 8 marks in total).

(d)

Explanation should include the following points:

- Start by reading publicly available reports eg Annual Reports.
- Read about and understand the industry dynamics, eg trade journals.
- Meet with company management.
- Meet with competing companies in the same industry.
- Meet with suppliers and customers of the company.
- Given we are going to be a fundamental bottom up investor, we would need to build earnings models of the company being analysed, and assess our views on earnings compared to the markets view.
- Assess our 'value' of the company compared to the share price, and multiples (eg PER) compared to peers.
- Assess the characteristics of the company/share versus the funds stated style, and/or target investment criteria.

(½ mark for each point, above up to a maximum of 4 marks)

Sources of information that should be mentioned:

- Annual and Half Yearly Reports
- Company presentations and news releases
- Broker reports
- Information services eg Bloomberg, IRESS, Reuters etc
- Other news sources (newspapers, Internet etc).

(½ mark for each, up to a maximum of 2 marks)

QUESTION 5 **(15 Marks)**

You are working as a financial planner and one of your clients (a wealthy retiree) has expressed an interest in investing in a market neutral long/short hedge fund. This client is currently invested in a range of pooled balanced type products, as recommended by you. The performance of these funds has been quite volatile over recent years, and hence the idea of a fund that may be able to outperform under a variety of investment market conditions is attractive to him.

(a) What are the advantages and disadvantages of investing in such long/short funds for your client? (5 marks)

(b) If the client was going to invest in such a fund, what are the primary issues and constraints that they should consider before commencing such an investment? (5 marks)

(c) One of the funds that your client is specifically considering investing in is a long /short equities fund with a Socially Responsible Investment (SRI) filter.
The manager of this fund is The Best of Both Worlds Funds Management (TBOBWFM). It has recently been formed to take advantage of the interest in socially responsible investing. In the promotional literature for the fund, the Managing Director outlined the philosophy of their investment process as follows:

> **"… what goes around, comes around. Companies that are unethical and do not look after their clients get found out sooner or later, generally in a spectacular fashion. Conversely, well managed, ethical business practices are the only way to sustainable investment. Hence our long/short fund will buy the shares of companies that meet our socially responsible criteria and short sell those companies who we consider to be unethical dinosaurs awaiting extinction."**

Discuss the merits of this product in general, and also in the context of your client's portfolio. (5 marks)

QUESTION 5: SOLUTION **(15 marks)**

(a)

Advantages

- Can potentially benefit from both rising and falling markets.
- Can better capitalize on manager's stock picking abilities.
- Potential diversification benefits due to low correlation with client's other investments.

Disadvantages

- Fees for such products can be quite high (in both relative and absolute terms).
- Need to be able to generate sufficient companies on both the long and short side in order to spread one's bets.
- Ability to short-sell stocks is limited.
- Requires a lot more work from the fund manager – enough resources?

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

(b)

Primary Issues and Constraints

- What are the risk and return expectations for the product?
- How much of the portfolio should be allocated to the product?
- How liquid is the product?
- What are the fees charged by the fund?
- Does including the fund in the portfolio comply with the restrictions in the client's investment policy statement?
- How many fund managers are applying the same process? And could they all potentially be looking to unwind their short positions at the same time?

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

(c)

Key points to address in the answer.

- Who determines the definition of 'ethical'?
- Could it be leveraging up one's exposure to such 'ethical' companies. Is this desirable?
- One of the problems with a long short fund in this context is that it could take a while for unethical companies to be found out. One might eventually be proven correct – but in the short term being incorrect on the stock price movements could lead to large losses that might breach the hedge funds limits and have to be crystallized and be closed out.
- The fact that a company is an unethical joke does not mean that its stock price will necessarily underperform. This may already be factored into its stock price, e.g. tobacco manufacturers.
- Also face the risk that many unethical businesses have proven to be quite resilient for various reasons, eg the tobacco industry is considered immoral by many, but it continues! Same goes for weapons manufacturers. Shorting these stocks could be dangerous.
- Even if ethics are an important driver of business success and hence share price success, there are other sources of positive and negative alpha that are not covered by this approach (what about ethical businesses run by idiots?) This will put the fund at a competitive disadvantage to other long short funds with similar
- What is the appropriate level of exposure?

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

QUESTION 6 **(9 Marks)**

You are the asset consultant to an Australian superannuation fund with $1 Billion of funds under management.

This fund's entire exposure to property is via a $100M investment in an unlisted property trust. This trust has been winding down over several years, and there is now only one other investor in this trust. This investor owns 25% of the trust (i.e. your client owns the other 75%).

The manager of the trust is keen to wind it up and has offered your client two options:

1. **To accept an equivalent dollar value (less a 3% discount) of shares in NewCo, a property management company about to be set up and listed on the Australian Stock Exchange.**

   NewCo will be managed by the manager of the current unlisted trust. The initial assets of this company will consist of the existing assets of the current unlisted vehicle, as well as some assets that the manager has taken from other unlisted trusts it manages. Further, this company will be able to participate in the development of new property projects.

2. **To assume 100% ownership of the unlisted trust by purchasing the units held by the other investor, at a price reflecting the most recent independent valuation of the properties in the trust.**

Your client has decided that it will accept one of these options, and has come to you asking for advice as to which option to accept. Draft a letter to your client discussing the pros and cons of each alternative. Your letter should also contain your recommendation, support of this recommendation, any assumptions you make and any further due diligence you would conduct before providing your final advice.

QUESTION 6: SOLUTION

At first glance, swapping units in the unlisted trust for shares in the company is the most attractive option, given that:

- This is a relatively clean and easy to implement option (the manager of NewCo seems to have set up all the arrangements/legals, etc)
- This approach would leave the fund's dollar exposure to property unchanged and presumably within their target levels.
- There is no requirement to fund – one is simply swapping units in a trust for a roughly equivalent investment in shares in a company. If the fund decided to buy out their existing co-investor in the unlisted trust they would need to disrupt their other assets and raise their exposure to property assets from $100M to $133.3M. Further, they would still be left with an investment in a small, probably poorly diversified and illiquid property portfolio.

- Presumably assets from elsewhere will also be incorporated into NewCo – or at least this is the intention, increasing the diversity of the asset base. This is likely to be useful given that the current $133M unlisted fund is not likely to be very well diversified.
- The new investment would also have better liquidity – an attractive by-product of the listing process.

Nonetheless, some potential problems with the move to the new entity remain:

- The 3% discount is a real cost that needs to be considered.
- Small listed property trust? Expensive to run?
- NewCo will not just be an unlisted property trust, but also a development company. This increases the risk profile of the fund's property exposure.
- The risk profile is also almost certain to change due to the introduction of leverage within the new management company structure.
- The tax and stamp duty implications of the two options are likely to be different. It may well be that the trust units for company shares swap could be deemed an effective disposal and involve an immediate tax and stamp duty liability, whereas buying further units in the trust is not likely to lead to similar complications.

On balance, I would recommend that the trust opt for swapping the units for shares in Newco. The 3% discount can be viewed as the price to be paid for obtaining liquidity. If the Trustee is not entirely happy the management contract, it can sell down its holdings in Newco. This aside, the Newco holding might be sold down anyway post asset swap, and an even more diversified property exposure achieved via further investments in list property vehicles.

Further due diligence would then include:

- What are NewCo's intentions regarding property development? What constraints will there be on the range and size of opportunities that it can pursue? What is the Manager's skill set in terms of developing properties?
- What are the constraints for using borrowing within the Newco structure?
- What are the other property assets to be included in NewCo? How large will this new entity be? Will it have economies of scale in terms of property management and development? How diversified will the resulting portfolio be? What is the quality / value of these properties?
- Tax sign offs.
- Stamp duty signoffs.
- Perhaps getting a second opinion on the valuations of the underlying properties in the unlisted trust, in order to confirm that the discount is not effectively considerably great than 3%.
- Confirming that the management contract between NewCo and the manager is reasonable.
- At what price would NewCo list? Do we have a view?
- What other costs will be incurred by NewCo? ASX listing and other compliance may well be significant and eat in to future returns.

- The move from a trust structure to a company structure will change the nature of ongoing distributions and taxation of profits. What will be the impact on these on the after tax returns of your super fund client?

(1 mark per valid point, including 1 mark for a recommendation. Student must make a firm recommendation. They must realise the pros and cons of the two different investments, especially the change in risk profile and liquidity issues. Some demonstration of street smarts (ie. is my client getting ripped off?) necessary for very high marks. Maximum of 9 marks in total)

END OF PAPER TWO SOLUTIONS