Marking Guide

Level of difficulty

Question	Units	Knowledge & Understanding	Straight-forward Judgement	Complex Judgement	Total Marks
1a	BM	1	1		2
1b	BM	1	2	1	4
1c	BM			2	2
1d	BM	2	2	2	6
1e	BM			2	2
1f	BM		2	2	4
2a	1	4	4		8
2b	1,2		2	2	4
2c	1,2		2	2	4
2d	1	1	2	1	4
3a	1	2	4		6
3b	1	2	3	3	8
3c	1	1	1	2	4
3d	1			2	2
4a	2		2	2	4
4b	2		2	4	6
4c	2	1	2	2	5
4d	2	2	1		3
4e	2		1	1	2
5a	2	3			3
5b	2		3	3	6
5c	2		1	2	3
5d	2	1	3	4	8
TOTAL		**21**	**40**	**39**	**100**

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Answer all 5 questions.

QUESTION 1 (20 Marks)

One of the highlights of the 2006/07 Federal Budget was a projected healthy budget surplus, including personal income tax cuts to be phased over the next 4 years.

The government engages in fiscal policy when it uses the budget to manage the economy. It decides on the taxes that it collects, the transfer payments it gives out, or the goods and services that it purchases. The primary economic impact of any change in the government budget is felt by particular groups—a tax cut for families with children, for example, raises the disposable income of such families. Tax relief for one sector may be seen as a transfer of wealth from another sector.

The main components of the budget surplus/deficit in previous years are summarised in the following table:

Budget Surplus/(Deficit) 1996-2006, $ billion

	Taxation Revenue[1]				Non-taxation revenue	Total Revenue	Total Expenditure	Operating surplus[2]	Cash surplus[3]
	Individual	Companies	Superannuation	Other	(Indirect)				
Fiscal year to:									
Jun-1996	60	18	2	36	5	122	132	-10	-5
Jun-1997	66	19	3	38	5	131	136	-5	3
Jun-1998	71	19	3	39	5	137	136	1	16
Jun-1999	77	21	4	40	5	146	141	6	13
Jun-2000	83	24	4	41	17	170	160	10	22
Jun-2001	77	35	5	35	14	166	165	2	11
Jun-2002	86	27	4	32	21	171	174	-4	2
Jun-2003	91	34	5	33	20	184	182	1	7
Jun-2004	99	36	6	34	18	193	190	3	8
Jun-2005	109	43	6	35	18	211	208	3	12
Jun-2006	114	49	7	36	19	226	210	16	14

Notes

1 Excludes GST (which is treated as a State tax).

2 Accounted for on a cash basis up to June 1999, and on an accruals basis thereafter.

3 The cash basis for surplus includes the net impact of equity sales (eg Telstra) and is that reported in the financial press.

You are a business commentator, and have been asked to give broad views of the impact of the government's fiscal policy for investing in Australia.

(a) Suggest reasons for the growth of the budget operating surplus over recent years. (2 marks)

(b) Discuss briefly the impact of a budget surplus for:

- **Economic activity (i.e. GDP)**
- **Inflation**
- **Interest rates**
- **corporate earnings (4 marks)**

(c) Discuss the effectiveness of using fiscal policy to stabilise economic activity. (2 marks)

(d) Discuss how fiscal policy with a budget operating surplus can impact investment returns for each of the main asset classes of equity, debt and direct (i.e. unlisted) property, and identify what other factors are relevant for these returns. (6 marks)

(e) The 'cash surplus' shown in the table above has been accounted for in the year that revenue and expenditure are paid, and includes net receipts from capital transactions (such as sales of government owned enterprises). On the other hand, the 'operating surplus' has been assessed on an accruals basis from 2000 onwards, without allowing for capital transactions. Briefly discuss the relative merits of these two current methods for the purpose of assessing the budget's investment impact. (2 marks)

(f) As part of the 2006/07 Federal Budget, the Government included the following initiatives:

- **Taxation of superannuation arrangements to be simplified, with no taxation of benefits for members after age 60.**

- **The Budget surplus to be transferred to the Future Fund, to finance the superannuation liabilities in respect of the government's own employees.**

List the possible implications of these initiatives for Australian investment markets. (4 marks)

QUESTION 1 SOLUTIONS

(a) Possible reasons for the growth of the budget operating surplus are:

- Increased company profits as a result of a strong economy, leading to higher levels of corporate tax revenue.
- Increased employment, leading to higher personal tax revenue.
- The effect of tax bracket creep on higher wages.
- Reduced expenditure, as a result of broadening of the tax base with the introduction of GST from 2000. [This has obviated commonwealth allocations to the States]
- Greater effort in minimising tax avoidance.

[½ mark per point, with a maximum of 2 marks]

(b) A healthy budget operating surplus has the following effects:

- Increased levels of taxation inhibit growth in the aggregate demand for goods and services (i.e. GDP) as it restricts large increases in individuals' disposable income.
- To the extent that government expenditure on goods and services from the private sector are limited, this also inhibits growth in aggregate demand.
- Limiting growth in aggregate demand helps to control price and wage increases.
- To the extent that the government has a cash surplus, it may afford to retire government debt (or at least not to increase it). This means that the government does not need to compete with the private sector for debt finance, thus easing pressure on interest rates.
- Corporate earnings are restrained by the growth in aggregate demand (though of course there may be stimulus from overseas, through more efficient technology or wage control).
- To the extent that interest rate rises are controlled, the exchange rate is also controlled, which keeps exporters competitive.

[1 mark per point, with a maximum of 4 marks]

(c) In the short run fiscal policy may be applied to insulate economic activity from shocks caused by external events (eg oil or commodities). However it is a blunt policy instrument as:

- The time taken for the effects in (b) to materialise can be very different, together with their flow on effects, meaning that fiscal policy can be self defeating in the longer term.
- The transfers involved between different sectors of the economy (eg the effect of low interest rates on borrowers and savers), especially with a restructure of government expenditure, means that there will be different impacts on different sectors.

[1 mark per point, with a maximum of 2 marks]

(d) Although a budget operating surplus is generally contractionary for economic activity, its effects on investment markets are indirect and can be offset by many other factors:

Equity

- Corporate earnings are restrained as noted in (b) but are subject to many external factors, including those that drive fiscal policy in the first place (eg commodity prices). The overall impact depends on industry structure, i.e. on how some industries can benefit from external demand stimulus and from growth in other industries.
- The effect on equity returns depends also on how corporate earnings is priced (i.e. the PE ratio). This is a function of investor perceptions of long run growth in earnings, which is only marginally affected by current fiscal policy. It is also driven by the long term view of interest rates. Pricing sentiment may be favourable notwithstanding a non-expansionary fiscal policy, eg as a result of overseas influences.

Debt

- Fiscal policy is but one factor in interest rates. A more immediate factor is monetary policy, which is concerned with short term inflation control and exchange rates.
- Fiscal policy has a direct bearing on the volume of government debt. However long term debt yields are driven primarily by long term expectations of monetary policy, and thus the impact of fiscal policy is limited.

Direct property

- The demand for direct property directly arises from corporate demand (eg WA). This is heavily regionalized and industry specific, and so the transfer effects of fiscal policy are relevant.
- Direct property prices are also subject to perceptions as to the long term demand by corporates and for interest rates.

[1 mark per point or reasonable equivalent, with a maximum of 6 marks]

(e)

- An accruals approach to measuring revenue and expenditure provides the dollar impact of all policy decisions made in a particular budget year, regardless of when those impacts arise. This may be relevant for a long term analysis of budget outcomes – though those outcomes will be affected by other budgets. The cash impact in a budget year is a more relevant indicator of how different sectors of the economy are immediately affected, and is more suited to assessing short term impact.

- The effect of non-operating budget surplus, eg equity sales, depends on how the proceeds of those sales are applied. For example, the 2007 sale of the government's residual interest in Telstra and investment of the proceeds in the Future Fund can be expected to strengthen demand for financial assets.

[1 mark per point or reasonable equivalent, with a maximum of 2 marks]

(f) The issues to be considered might be as follows:

- The greater demand for financial assets resulting from both public and private sector savings.
- The effect of the superannuation tax policy on the savings of the working population, who will effectively subsidise the reduced taxation of benefits for the retired population.
- The possible increase in productive capacity as a result of increased savings.
- The substitution of private for public sector capital in financing infrastructure.

[1 mark per point or reasonable equivalent, to a maximum of 4 marks]

QUESTION 2 **(20 Marks)**

An active international fund manager employs various techniques for adding value to its debt portfolios. Curiously, its Australian and international bond portfolios are managed by different teams in different locations, and the techniques applied differ as follows:

Contribution to performance %

Performance Factor/Technique	Australian Bonds	International Bonds
Duration	35	45
Yield Curve	10	5
Sector Selection - Govt bonds, semi-Govt bonds, corporate etc.	-	5
Issue Selection and credit analysis	20	5
Arbitrage and spread anomaly using forwards, swaps etc.	35	-
Country Allocation	-	35
Currency Exposure	-	5
Technical Analysis	-	-
TOTAL	100	100

You are a management consultant engaged by the fund manager to review its strategic and operational structure.

(a) For each of the performance factors mentioned in the table above, describe briefly:

- **How the fund manager can add value using techniques based on that factor;**
- **The information needed to add value; and**
- **The expertise required of the fund manager to add value.**

(8 marks)

(b) Consider the relative contributions of the performance factors listed in the table above for the two bond portfolios. What qualitative features of the two bond markets would explain the differences between these portfolios in the relative contributions of these factors? Are the differences justified? (4 marks)

(c) Techniques for the four performance factors used for the Australian bond portfolio are presently implemented by the Australian team alone. However the manager has a decision as to whether an alternative centralised global approach should be taken for some of these techniques, involving input from both teams. Which of these approaches is preferable for each factor, and why? (4 marks)

(d) In comparing the relative performance of Australian and International bonds:

- **What are the merits of adopting a hedged benchmark for international bonds (i.e. a benchmark where currency risks are hedged)?**
- **Would you expect benchmark returns for Australian and international bonds (with currency hedged) to be different? Why?**
- **Would you expect excess returns (i.e. returns relative to benchmark) for *actively* managed Australian and International bond portfolios to be different? Why? (4 marks)**

QUESTION 2 SOLUTIONS

(a) The various techniques may operate as follows:

Duration:
- exploits expected shifts of the overall *level* of the yield curve
- relies on forecasting the direction of interest rate movements
- requires expertise in analysing economic factors that drive interest rates, i.e. monetary policy, balance of payments, inflation.

Yield curve analysis:
- exploits expected movement in the *shape* of the yield curve
- relies on forecasting the timing and quantum of interest rate movements
- requires expertise in assessing expectations of future interest rates, i.e. long run economic growth, as well as experience with the behaviour of participants who patronise various ranges of the yield curve

Sector selection:
- exploits the relative pricing of generic types of debt security
- relies on deriving a yield advantage when pricing is not commensurate with risk
- requires an assessment of credit risks for the various types of debt security.

Credit analysis:
- exploits the relative pricing of particular debt securities
- relies on deriving a yield advantage when pricing is not commensurate with risk
- requires an assessment of creditworthiness of the issuer and its market pricing

Arbitrage and anomalies:
- Exploit failures of pricing relationships or rules of thumb in particular situations (cash/carry for futures/physicals)
- relies on buying the underpriced asset/selling the overpriced asset
- requires knowledge of the relationships and the systems to identify failures in real time

Country allocation:
- Exploits different interest rate regimes in different types of economy
- relies on interest rates being dependent on different factors (GDP growth, investment levels) in different countries
- requires an understanding of the underlying drivers and their interdependence across different economies

Currency exposure:
- Exploits the strength of different currencies
- relies on currency risks being different and reflecting an economy's balance of trade
- requires a understanding of the trade and capital movements that drive currencies

Technical analysis:
- Exploits patterns in yield curve movements
- relies on the validity of theories of pricing movement
- requires a faith in these theories and the ability to process historical pricing information

[1 mark for the 3 points under each heading making a total of 8 points]

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(b) The weightings given to the various techniques should reflect the perceived inefficiencies of the various markets as follows:

Factor	Australian Bonds	International Bonds
Duration	Relatively efficient, so lower weight justifiable	**Some regions inefficient, so high weighting justified**
Yield Curve	Few drivers – efficiency hard to assess	Few drivers – efficiency hard to assess
Sector Selection.	Sectors generally efficiently priced, so no weighting	Sectors generally inefficiently priced, so higher weighting justified
Credit analysis	Relatively inefficient – weighting adequate	**Credit pricing generally inefficient, so expect higher weighting**
Arbitrage and spread anomaly	**Regard as efficient- hard to justify very high weighting**	Expect greater inefficiencies than in Australian market
Country Allocation	NA	High weighting justified in view of diversity of interest rate drivers
Currency Exposure	NA	Low weighting justified in view of lack of understanding of currency drivers
Technical Analysis	NA	NA

[1 mark for bolded comments; ½ mark for others, up to maximum of 4 marks]

(c) In relation to the four techniques employed for Australian bonds:

- Duration: the drivers of interest rate levels include real GDP growth, exchange rate and overseas interest rates, and hence the issues for duration are very global in character.
- Yield curve: the timing of interest rate movements is affected by political (fiscal) and monetary decisions, and hence local in character.
- Credit analysis: depends on the financial strength of individual issuers, and hence analysis should be undertaken locally.
- Arbitrage: encompasses relationships with offshore instruments (via currency/interest rate swaps), and hence should be monitored globally.

[1 mark per point, up to a maximum of 4 marks]

(d) The benefits and limitations of adopting a hedged benchmark for international bonds are as follows:

- A hedged benchmark reflects ‘pure’ interest rate risks, and international investment is directed towards diversifying these risks rather than about currency speculation.
- Currency adds unrewarded volatility in international investment, as it is uncorrelated with long term yield movements.

But:

- Short term interest rates and forward exchange rates are logically linked via interest rate parity. Thus currency may be viewed as an integral part of investing in bonds.

  [1 mark per point]

  By virtue of interest rate parity, investment in short term Australian and overseas bonds should provide very similar returns. However the term spreads (i.e. the difference in yields between short and long term bonds) is very different, reflecting amongst other things long term expectations of GDP growth. These can be significantly higher for developing economies than in Australia.

  [1 mark]

  The reasons for international bond investment are not only diversification across different interest rate regimes but also exploitation of markets that are less efficient than in Australia. This holds particularly for credit risks and country specific risks.

  [1 mark]

  Thus we would expect active management to provide higher excess returns for international investment than for Australian investment
  [1 mark]

  [1 mark per point to a maximum of 4 points]

QUESTION 3 **(20 marks)**

You are an adviser to a prudential regulator for a developed economy, involved in setting capital requirements for financial institutions. These requirements are directed towards ensuring the solvency of financial institutions with an acceptable likelihood.

The difficulty you face is that financial institutions differ widely in the nature of their activities, investment policies and liabilities. Some activities may be segregated in subsidiaries. Some liabilities may take the form of implicit guarantees. This makes it difficult to set requirements that are applicable to all institutions.

(a) Discuss what characteristics of liabilities held by a financial institution are *critical* to assessing the capital required under a given asset strategy. **(6 marks)**

(b) For each of the main types of asset, namely equity, debt and direct (i.e. unlisted) property, discuss briefly the characteristics of the asset model which are *critical* for assessing solvency for any particular type of liability.

[You could consider, amongst other things, the following aspects:

- **The dynamics of the asset model**
- **The degree of sensitivity of the model to current conditions**
- **The interrelationships of the asset classes**
- **The relationships with liability characteristics.]**

(8 marks)

(c) Outline how you would apply the asset model to assessing capital requirements. **(4 marks)**

(d) Discuss whether there should be any restrictions on how the required capital, as assessed in (c), should be invested. **(2 marks)**

QUESTION 3 SOLUTIONS

(a) A key consideration in setting capital requirements is the degree of mismatch between assets and liabilities. Thus the capital requirements should vary according to the asset strategy adopted for a particular type of liability as well as the characteristics of those liabilities.

[1 mark]

For matching purposes the following characteristics of liabilities are relevant:

- The term (duration) of the liability cash flows
- The economic drivers that determine the quantum of cash flow (eg CPI, AWOTE, court judgements), and the uncertainty of these drivers
- The linkages between cash flows and currency levels or equity indexes.
- The existence of options implied in the liabilities (i.e. guarantees)

[1 mark per point]

Depending on the liability characteristics, asset strategies may be more or less adaptable to matching liability cash flows. At one extreme, where liability cash flows are fixed in nominal terms, it may be possible for a bond portfolio to be structured to match cash flows precisely. Some degree of matching may also be found where an asset has similar economic drivers to those of the liabilities (eg CPI-linked liabilities and infrastructure). At the other extreme, some liability characteristics may have no counterpart on the assets side (eg. mortality risks).

[2 marks]

[Award marks for points made as above, to a maximum of 6 marks for this part]

(b) The key characteristics for different types of assets are as follows:

Equity

- Long term return distribution (realistic skewness and kurtosis, for modelling extreme events)
- Dynamic volatility and autocorrelation in returns (to assist in modelling extreme events)
- Consistency of expected return with long term debt (i.e. a realistic expectation of the equity risk premium)
- Consistency of return expectation with current pricing levels (may require revision if current conditions change

Debt

- Model for debt returns should be based on model for debt yields
- Expected return in line with long term interest rate expectations (i.e. with CPI and GDP growth, used for assessing liabilities)

- Consistency with model for short/long term debt yields, given current yield levels (as such yields are used for liability valuation, but may require revision if current conditions change)
- Mean reversion and serial correlation of debt yields (to ensure realism of interest rate movements, and to ensure similar behaviour of debt returns)
- Duration of bond portfolio appropriate to the term of liabilities
- Dynamics consistent with equity returns.

Property

- Consistency with equity and debt returns (as property displays characteristics of both)
- Appropriate dynamics reflecting appraisal basis of valuation, but also lagged linkages with equity returns (if this is the measurement basis for property).

[1 mark for each point or reasonable equivalent, up to 8 marks]

(c) The way that the model should be applied depends on how liabilities are to be measured. If it is required that a bond yield appropriate to the duration of the liabilities is to be applied, then simulations of bond yields must be undertaken for this purpose. If liabilities can be assessed at market value (eg currency contracts), then the relevant economic or financial variables (eg exchange rates) must also be modelled.

[1 mark]

In this event, for each type of asset allocation involving equity, debt and property, simulations of asset returns and liability values could be undertaken. The latter would be based on a typical set of liability cash flows, discounted at the simulated bond yields under the asset model. The initial asset value that would allow projected liabilities to be covered by projected assets at the required level of probability may then be determined from the simulations. This asset value may be expressed as a percentage of the initial liability value to assess a capital reserve for the given asset allocation.

[2 marks]

By repeating this exercise for different asset allocations, rules may be developed for assessing the appropriate capital reserve as a function of the asset allocation. Then repeat this exercise for different types of liability.

[1 mark]

(d) The analysis in (c) assumes that all assets, including capital reserves are invested in the same way. If capital reserves are required to be invested in more secure investments, the level of the reserves may be reduced accordingly.

[1 mark]

There may be some advantage to the regulator of requiring all or part of capital requirements to be invested more securely (eg the former Prime Assets Requirements for banks to invest in government securities and currency). This helps to ensure very short term liquidity where liabilities are of very short term. However liquidity is an aspect that can vary significantly between organisations, and difficult for a regulator to set firm rules for. For stakeholders in such organisations, such a requirement would be an unnecessary restriction on investment policy and an impediment to returns.

[1 mark]

QUESTION 4: (20 marks)

Sustainable Investing (SI) is usually defined as:

"…an approach that recognises the *financial* implications of economic activity over a *broader* range and *longer* timeframe than traditional approaches for equity investment."

This is a very broad definition, and encompasses a variety of specific approaches based on social, environmental, or corporate governance factors. Current examples are: (avoidance of) carbon emissions; bioethical standards; and employment relations. However the emphasis is on the *financial* implications, meaning that the SI approach is concerned exclusively with investment returns generated by these factors.

In practice SI may be implemented by the use of positive (or negative) 'screens' that include (or exclude) stocks according to specified SI criteria. It may also be implemented on a 'best of breed' approach, where index sector weights are respected, but the stocks best fitting the criteria in each sector are selected.

(a) Suggest possible theoretical justifications for the SI approach, and what differentiates it from traditional approaches. (4 marks)

(b) Is it valid to view SI as a management style? Why? How does it differ from the traditional value and growth styles for equity investment? Which of the traditional approaches does SI (as described above) most closely resemble? (6 marks)

(c) The empirical evidence for the relative performance of SI against traditional approaches is generally inconclusive. Suggest reasons why this may be so, and discuss the possible difficulties in assessing SI performance. (5 marks)

(d) What information would you seek for selection of managers that is specific to SI, and what special risk controls would you impose in SI mandates? (3 marks)

(e) What issues would you consider in incorporating SI into an overall portfolio approach? (2 marks)

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QUESTION 4 SOLUTIONS

(a) Possible justifications and distinguishing features are as follows.

- Proponents of SI may argue that markets are not efficient in reflecting the SI factors as described in the pricing of assets. This may be because information on such factors is not available, or is not sought because it is costly.

- Though this is a general principle that is used to justify different active management styles, it would not distinguish SI as an active style. Moreover it is unlikely that SI information has been overlooked.

- What may distinguish SI as a different approach is that it embodies factors that have not been taken into account in asset pricing because their effects are considered too distant to be of any relevance. A current example is in carbon emissions, a form of pollution. If penalties were to be introduced to companies that pollute, the effects would be more immediate.

- Thus SI factors may be different from other investment factors in that the effect of those factors on long tem company profits is not anticipated.

[1 mark per point]

(b) SI may be viewed as a management style to the extent that it does rely on specific factors that are thought to contribute or detract from performance. [1 mark]

However those factors differ from value or growth factors in the following respects:

- They do not rely on perceptions of price in relation to current earnings (as does the value style).

- They do not relate to any particular industry or technology (as do growth styles).

- They may be entirely related more to internal process (eg bioethics) rather than the earnings outcomes possible under current conditions.

- They are generally qualitative rather than based on any quantitative measurement.

[1 mark per point or reasonable equivalent]

As such the closest analogy is with quant or thematic styles based on a range of quantitative and qualitative factors. However a much longer timeframe for the assessment of performance would have to be considered. [1 mark]

[award marks as indicated above to a maximum of 6 marks for this part]

(c) Possible difficulties are as follows:

- The timeframe for performance evaluation is much longer than for other management styles.
- It is difficult to attribute performance solely to SI criteria; SI managers may employ non-SI criteria for stock selection, and these criteria may overlap under certain economic conditions.
- It is difficult to verify that SI managers follow the SI principles they espouse.
- As with a comparison of value or growth styles, the business cycle may affect the returns achieved under SI styles, and hence bias the comparison against other styles.

[1 mark per point or reasonable equivalent]

Given that SI factors are not likely to change dramatically over time for any particular stock, the turnover of stocks for SI managers should be explained.
[1 mark]

[award marks as indicated above to a maximum of 5 marks for this part]

(d) The information sought should include:

- The SI factors targeted.
- The active returns attributed to these factors.
- The method of assessment of SI factors for particular stocks.

[½ mark per point]

The risk controls should cover, as with all management styles:

- The uncertainty attached to SI factors.
- The tracking error against established indexes to be met.
- The impact of portfolio turnover.

[½ mark per point]

[award marks as indicated above to a maximum of 3 marks for this part]

(e) The issues for including SI in an equity portfolio would include:

- The likely interaction of SI factors with other factors used in active management (such as PE and price momentum). This would help in assessing portfolio diversification and the level of outperformance that can be expected against index benchmarks.

- Whether SI satisfies the governance criteria for an investment in the best financial interests of fund members.
- The level of stock turnover relative to active management styles. This would help to gauge the passivity of SI styles and their CGT impact.
- The level of management fees offered.

[½ mark per point to a maximum of 2 marks for this part]

QUESTION 5 **(20 marks)**

You are the CFO of a widely diversified financial group that has banking, insurance and investment arms. You are considering the adoption of Basel II type risk measures for the management of the group's financial risks across all its business units.

Basel II is a framework of international protocols developed for banking supervision. It covers risk measurement and capital, banking regulation and disclosure. Your main interest is in the framework to be adopted for risk measurement, which identifies three relevant types of financial risk:

- **Credit risk is that faced by the group on the non-payment or default on debt advanced to customers. The 'standard' approach for risk measurement is based on external assessment of borrowers (eg AAA, AA+) by credit rating agencies (e.g. S&P, Moodys).**

- **Operational Risk is that "…resulting from inadequate or failed internal processes, people and systems, or from external events". The 'standard' approach for risk measurement is to adopt a set percentage of revenue, depending on the type of activity involved, eg corporate or retail banking, broking, investment management.**

- **Market Risk is that due to the performance of the assets held to cover liabilities, in particular the mismatch between them. Under Basel II, the standard approach for risk measurement is based on *Value-at-Risk* (VaR).**

The measurement of all three risk types can be standard, depending on the type of business activity in question, or tailored to the specific structure and experience of the organisation.

(a) **Compare the significance of each of the three risk types for the group's three business segments.** **(3 marks)**

(b) **Discuss whether credit risk assessment could be undertaken by the standard approach as described above, or be specifically designed for each of the group's business segments.** **(6 marks)**

(c) **Suggest a broad approach to measuring operational risk that can take account of the organisational structure of the group. What features of the administration would you consider relevant in this respect?** **(3 marks)**

(d) The VaR measure of market risk for a business segment is defined as:

"..the maximum loss, measured at market value, that can be expected with a given likelihood over a given period."

Discuss the suitability of this risk measure for management purposes, compared with other risk measures, such as factor exposure (the sensitivity of the economic value of the business to a particular risk factor). You might consider the following issues:

- **The possible range of risk factors**
- **The ability to quantify risks**
- **The timeframe for risk measurement**
- **Interactions between risk factors** **(8 marks)**

QUESTION 5 SOLUTIONS

(a) Banking obviously is exposed to all three types of risk: credit risk in lending; operational risk in transactions; and market risk in the matching of loans and deposits. [1 mark]

Insurance is most exposed to market risk in the mismatch between assets and liabilities, though this is mitigated for insurance savings products. Operational risk is present whenever customer records and transactions are needed. Credit risk is limited to that in debt investments or in reinsurance of liabilities. [1 mark]

Investment suffers from operational and credit risks in the same way as insurance. It is not usually exposed to market risk as this is passed through to the client (except to the extent that management fees depend on market performance). [1 mark]

[All 3 types of business should be covered and each of the 3 types of risk should be considered for full marks. Markers can use their discretion in awarding part marks for partially correct answers.]

(b) The standard approach to credit risk assessment is based on the information available to credit rating agencies: financial statements, public information (such as stockmarket reports and prices), and some individual analysis. [1 mark]

For insurance, credit risk is limited to that in debt investments or in reinsurance of liabilities. Investment is exposed to credit risks via holdings of debt instruments. Accordingly these types of business could use the standard approach to credit risk assessment.

A bank has potentially much more detailed information in respect of its lending operations:

- The intended uses of funds raised for future operations
- Daily movements of customers' cash positions
- Some control over borrowing activities by means of covenants and restrictions on lending
- Knowledge of market factors affecting all clients in particular industries (eg mining)

[1 mark per point, up to 3 marks]

As such, the group can construct a credit model for its customers that embrace a wider range of credit information, some of which is private. [1 mark]

This can include the development of early warning signals to manage credit limits for customers. [1 mark]

(c) An approach specific to the group's administration could be based on a model of transactions between the group and its customers and suppliers, and between different business units within the group. [1 mark]

The administration aspects that are relevant to this model could be:

- The complexity of transactions
- The information systems employed
- The authorities and delegations that govern human intervention.
- The dollar value of systems failure

[½ mark per point]

[Award marks as suggested above to a maximum of 3 marks for this part. Markers may use their discretion in awarding points for other equally valid answers]

(d) The VaR approach places a dollar value on loss for specific types of business, and can be used to allocate scarce management resources and to assess relative capital requirements. [1 mark]

However VaR:

- is a measure of downside risk, and can vary dramatically (eg, when option-like liabilities are involved).
- Does not indicate the relative causes of risk, which can be a mixture of different market effects, such as arising from interest rates, currencies, commodities or equity industry sectors
- Requires a subjective assessment of the underlying risks and their interactions
- Is not additive over different types of business, and hence depends on how businesses are structured
- Does not allow for possible recovery from loss in the longer term (eg. for underperforming equity risks).
- May depend critically on the specific period and the loss tolerance used for measurement.

[1 mark per point, up to 5 marks]

Exposures to specific risk factors (such as interest rates), on the other hand, do not quantify likely loss but only the possible extent of loss if an adverse event occurs. Such exposures are more durable, and they can be used to estimate total loss for any combination of adverse events. Thus they are more useful as a management tool for responding to events.

[1 mark]

They can avoid the problems of additivity and timeframe dependence noted above, but the assessment of adverse events must itself be subjective.

[1 mark]

[Award marks as suggested above, to a maximum of 8 marks for this part of the question]

END OF PAPER

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