SECURITIES & INVESTMENT INSTITUTE DIPLOMA

INVESTMENT ANALYSIS CHIEF EXAMINER'S REPORT

JUNE 2009

GENERAL COMMENTS:

In general the performance of the candidates sitting the Investment Analysis paper was good, and few candidates appeared unprepared for the paper. The vast majority of the candidates attempted all of the questions. Where tested, useful market knowledge was demonstrated by candidates, particularly in the essay questions. Areas in which candidates should direct greater attention include: critical appraisal of a company's business model; the precise definition of key financial ratios; the meaning and scope of corporate social responsibility; the provision of structured investment advice on a case study company; more involved equity valuation numerical problems; numerical hedging problems; the range and relative merits of price multiples models; and the precise meaning of quantitative easing.

SPECIFIC COMMENTS:

SECTION A:

Performance in section A varied somewhat across the questions, though the majority of candidates showed evidence of advanced preparation in their approach to the analysis of a case study company. The vast majority of candidates were able to describe the main activities of the case study company in part (a) well and both compute and comment upon operating profit margins by business segment in part (b). Most candidates were able to analyse the balance sheet of the company well in part (c), though the minority were somewhat too brief in their commentary. Performance in part (d) was disappointing given the relatively straightforward analysis of business model strengths and weaknesses required. Part (e) was not well attempted by many candidates as they could not recall the precise ratio definitions for interest cover and ROCE. In part (f), some candidates were too brief in their commentary whereas others confused CSR with corporate governance. The profit and EPS forecast required by part (g) was well executed by the majority of candidates, though the recommendation in part (h) was disappointing in terms of its scope and credibility.

SECTION B:

Performance in section B also varied significantly across the questions. Question 2 concerning convertible bonds was very well attempted. Question 3 on the Capital Market Line was also well attempted, though a minority of students could not determine whether the shares were under or overvalued. Performance in Question 4 was very poor as the majority of candidates failed to understand the logic of the equity valuation problem. Question 5 was well attempted, with most candidates showing a good understanding of the term structure. Question 6 was very well

attempted, though a minority of candidates could not recall the expression for computing Macaulay duration. Performance in Question 7 was poor as many candidates were unable to provide a structured and logical set of solutions to the problem. Question 8 was reasonably well answered, though some candidates were somewhat unsure of the precise definition of Tobin's Q. Finally, most candidates could recall the definition of GDP deflator and could compute real GDP in the numerical problem in Question 9.

SECTION C:

Performance in section C was generally good. In Question 10, performance was generally good, though whilst most candidates could clearly explain the impact of recession on economic agents, not all could clearly define or explain the concept of a recession. Question 11 was not popular with candidates, and those who tackled it performed relatively poorly as they failed to provide a detailed discussion of the relative merits of price multiples models. Question 12 was well attempted, with most candidates able to discuss variants of the CAPM. Question 13 was reasonably well attempted, though whilst most candidates could explain a range of monetary policy tools, not all could adequately explain the concept of quantitative easing. Question 14, regarding companies which are "too big to fail" was well attempted by most candidates.

SECTION A **TOTAL 40 marks**

Q1.

(a) Briefly describe the main activities of Marston's plc in the year ending 4th October 2008.

(2 marks)

Marton's plc is a company within the restaurants industry with operations including both managed and tenanted public houses, as well as brewing. It has four segments for reporting purposes: Marston's Inns and Taverns, Marston's Pub Company, Marston's Beer Company, and Marston's Group Services. Marston's Inns and Taverns is the managed pub division of the company which has 506 pubs and bars located across England and Wales, focusing on community and food-led pubs. Marston's Pub Company is the trading division, with in excess of 1,700 tenanted and leased pubs under management, with income earned from the sale of alcohol, rents, and gaming machines. Marston's Beer Company is the brewing division of the company, with five breweries sited across England: Marston's, Park, Castle, Ringwood and Wychwood Breweries.

(b) Calculate and comment upon the operating profit margin of Marston's plc for the years ending 29th September 2007 and 4th October 2008 by each of its major business activities.

(4 marks)

	2007			2008		
	Revenue £m	Profit £m	Margin (%)	Revenue £m	Profit £m	Margin (%)
Inns and Taverns	367.8	66.1	*18.0%*	388.3	66.5	*17.1%*
Pub Company	200.9	90.4	*45.00%*	186.4	89.3	*47.9%*
Beer Company	121.8	16.9	*13.9%*	125.7	14.2	*11.3%*
Group Services	-	(12.7)	-	-	(13.1)	-
Total	*690.5*	*160.7*	*23.3%*	*700.4*	*156.9*	*22.4%*

Or excluding sales to other segments:

	2007			2008		
	Revenue £m	Profit £m	Margin (%)	Revenue £m	Profit £m	Margin (%)
Inns and Taverns	367.8	66.1	*18.0%*	388.3	66.5	*17.1%*
Pub Company	200.9	90.4	*45.00%*	186.4	89.3	*47.9%*
Beer Company	84.1	16.9	*20.1%*	91.4	14.2	*15.5%*
Group Services	-	(12.7)	-	-	(13.1)	-
Total	*652.8*	*160.7*	*24.6%*	*666.1*	*156.9*	*23.6%*

The Inns and Taverns division saw a marginal increase in sales due to an increase in average sales per pub, as a result of increased food sales and higher occupancy rates due to a refurbishment programme. However, the profit margin decreased marginally due to higher food services and input costs. The Pub Company division saw a

reduction in sales due to the disposal of a large number of lower growth pubs. The profit margin increased marginally as a result of the disposals and integration benefits following acquisitions. The Beer Company division saw a marginal increase in sales (more significant once sales to other segments is deducted) due to increased volume of own brewed beer and acquisitions of two new breweries. However, profit margins decreased significantly as a result of increases in raw materials and fuel costs which impacted on brewing and distribution costs. Overall sales saw a marginal increase and profitability experienced a marginal fall.

(c) With reference to the Group balance sheet, comment upon the changing financial position of Marston's plc.

(5 marks)

The company has marginally grown its fixed asset base by expanding its productive capacity in terms of PPE and other intangible assets. The PPE grew mainly due to additions of land and buildings, and fixtures and fittings. Other intangibles rose mainly due to the acquisition of new brands. The company therefore has greater productive capacity in 2008 than in 2007. There is a significant increase in current assets due largely to an increase in cash and equivalents, assets held for sale and receivables. The reason for holding increased cash is not clear, though may be due to the company's acquisition policy. The increase in assets held for sale is effectively an increase in properties which have yet to be sold. The increase in receivables is mainly due to an increase in trade receivables but it is not felt that these clients will default as they are established customers. Overall, the company has invested more significantly in working capital than in the previous year, an investment which is more marked considering the dramatic fall in current liabilities. Current liabilities have fallen dramatically in the year 2007 to 2008 due to a large fall in short-term borrowings which is only partly offset by an increase in payables. In particular, unsecured bank borrowings have been reduced dramatically, perhaps reflecting difficult bank credit conditions. At the same time, there is some evidence that the company is stretching its payables a little as well as suffering from an increased tax liability. Longer-term liabilities have seen a significant increase over the year as the result of a significant increase in long-term borrowings (in contrast to the reduction in short-term term) and an increase in derivative instruments. The company has shifted its capital structure towards longer-term borrowing, and also towards securitised borrowing, again reflecting a more difficult borrowing environment, and a marked shift in the maturity structure of its debt. Indeed, a large proportion of the secured debt is due in 1-2 years. The increase in derivative instruments is the result of interest rate swaps employed to manage the new secured debt interest rate risk. The total equity of the company has fallen significantly due mainly to the significant fall in retained earnings and a cash flow hedge. Marston's plc has therefore seen a weakening financial position due to weakening financial performance and increased gearing, though has improved its liquidity position and changed its debt structure to accommodate worsening credit market conditions.

(d) Briefly explain within the context of the business model, the key strengths and weaknesses of Marston's plc.

(4 marks)

Marston's plc's business model focuses on targeting growth through its estate, greater training, wider distribution of its higher margin beers, increased vertical integration and asset-liability matching. Its strengths are its ability to churn its estate towards higher profit and higher growth pubs through selective acquisitions and disposals, its achievement of scale economies and supply chain control through vertical integration, its risk reduction through asset-liability matching, long-term tenancies, and increased geographical spread, tight cost control through efficiency savings, and its customer loyalty and emphasis on value for money. Its weaknesses include its much higher gearing, a large part of which is due for renewal in 2010, and the fact that it is being directly hit through the economic slowdown as more pub-goers stay at home rather than venture out to the pub.

(e) Calculate and comment upon the following ratios for Marston's plc for the years ending 29th September 2007 and 4th October 2008:
(i) Interest cover;
(ii) Return on Capital Employed.

(4 marks)

(i) Interest Cover

$$\text{Interest cover} = \frac{\text{Profit before interest and taxation}}{\text{Interest expense}}$$

This ratio measures the 'financial safety' of the firm i.e. to what extent can it cover the interest payments to its debt holders? It is sometimes referred to as 'income gearing'. A rule of thumb for income gearing is that firms should be concerned if this ratio falls below about 5.

The interest cover ratio for Marston's plc for 2007 and 2008:

2007: IC = 160.7 / 68.8 = 2.34
2008: IC = 156.9 / 80.6 = 1.95

Clearly, the interest cover of Marston's plc has deteriorated significantly due to its increased gearing. Whilst much of the debt is secured upon real estate, the company has little margin of safety if earnings fall sharply in the near future.

(ii) Return on Capital Employed

$$\text{ROCE} = \frac{\text{Net profit before interest and taxation}}{\text{Share capital + Reserves + Long-term loans}} \times 100$$

This ratio measures the profit produced by the firm from its capital base (its debt and equity). It is one of the most commonly quoted profitability measures.

ROCE 2007 = 160.7 / (748.5 + 1,133.6) x 100 = 8.54%
ROCE 2008 = 156.9 / (706.9 + 1,299.0) x 100 = 7.82%

Marston's plc has suffered a deterioration in ROCE due in part to its falling EBIT margin but also due to its marked increase in gearing. The firm is thus less effective in producing earnings from its capital base in 2008 compared with 2007.

(f) Briefly summarise and explain Marston's plc's approach to corporate and social responsibility.

(3 marks)

Marston's plc discusses its "FIT" approach in its CSR report, emphasising fairness, integrity and transparency in relation to its stakeholders. It has a CSR Committee to ensure adherence to this approach and to oversee its CSR activities. It highlights its relationships with stakeholders as follows:-

- Employees – good consultative and collective bargaining record;
- Diversity – diversity awareness programme and flexible working promoted;
- Development opportunities – wide range of development opportunities;
- Health and safety – health and safety training and monitoring;
- Alcohol awareness – wide range of alcohol awareness promotions and codes;
- Responsible retailing – drug awareness and training to combat underage drinking;
- Community – support of various charity initiatives;
- Ethical purchasing – adherence to ethical purchasing codes;
- Environmental impact – production of environmental report and focused reduction of input use and waste.

The company is now a member of FTSE4Good to further demonstrate its commitment to CSR.

(g) Prepare forecasts of profit before and after tax and earnings per share for Marston's plc for the year ended 3rd October 2009. Explain the basis of your computation and of any assumptions that you have made.

(10 marks)

	2007 £m	**2008 £m**	**Forecast 2009 £m**
Turnover by activity			
Inns and Taverns	367.8	388.3	***410***
Pub Company	200.9	186.4	***173***
Beer Company	84.1	91.4	***92***
Group Services	-	-	**-**
	652.8	*666.1*	***675***
Operating profit			
Inns and Taverns	66.1	66.5	***66.4***
Pub Company	90.4	89.3	***83.0***
Beer Company	16.9	14.2	***12.0***
Group Services	(12.7)	(13.1)	***(13.5)***
	160.7	*156.9*	***147.9***
Margins (%) by activity			
Inns and Taverns	*18.0%*	*17.1%*	***16.2%***
Pub Company	*45.00%*	*47.9%*	***48.0%***
Beer Company	*20.1%*	*15.5%*	***13.0%***
Group Services	-	-	**-**
Total	*24.6%*	*23.6%*	***21.9%***

Justification of forecasts for turnover and profit margins should be carefully presented by candidates and based upon recent trends in these variables and future potential drivers. The figures presented here are for the purposes of illustration only and do not constitute a 'model answer'.

Estimates of charges on operating profits for the year ending 2009 are based on the following:
Operating expenses – 76.4% of revenue in 2008; projected operating profit = £147.9m and thus operating expenses for 2009 = 78.1% of revenue.
Finance costs:
2008: Finance costs of £80.6m on total debt of (£29.2 + £1,299.0m) = 6.1%.
2009: No further long-term financing requirement articulated by the company and therefore finance costs to remain the same.
Finance income – the figure is projected to remain the same in the absence of further information.
Movement in fair value of interest rate swaps – these are exceptional costs and are therefore are not expected to be repeated.
Income tax expense
2008: Tax of £14.4m on profit of £76.2m = 18.9% which is rather low, but largely the result of exceptional items.

2009: Tax assumed to approach the normal corporate tax rate of 28%, but with further miscellaneous exceptional items, thus select tax rate of 24%: £71.4m x 24% = £17.1m.

	2008 £m	2009 £m
Revenue	666.1	675.0
Operating expenses	(509.2)	(527.1)
Operating profit	156.9	147.9
Finance costs	(80.6)	(80.6)
Finance income	4.1	4.1
Movement in fair value of interest rate swaps	(4.2)	-
Profit before taxation	76.2	71.4
Taxation	(14.4)	(17.1)
Profit for the period attributable to equity shareholders	61.8	54.3

Basic earnings per ordinary share = £54.3m/ 271.9m = 20.0p

This does not compare favourably with a basic earnings per ordinary share of 22.7p for 2008. The weighted number of shares using the 2008 weighted average number of shares as the repurchase programme is not expected to be repeated.

(h) Advise on the desirability of investment in the shares of Marston's plc at the price shown on page 1 of the Information Pack. Explain the reasons behind the advice given.

(8 marks)

Discussion here may vary, though should provide: a summary of sales and profit forecasts linked to a discussion of current and potential future performance in key markets; a brief summary analysis of key fundamentals, including free cash flow generation; and finally, a recommendation based upon consideration of selected firm and industry current and forecast financial variables such as EPS and P/E.

SECTION B **Total 30 marks**

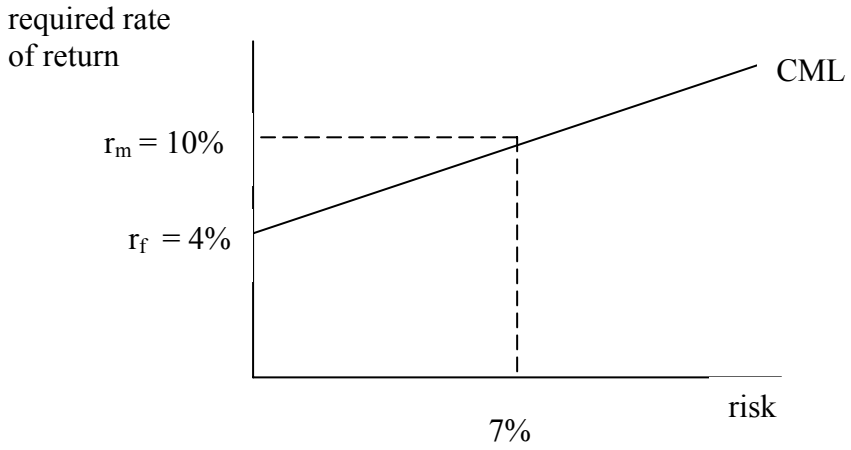
2. What are the advantages and disadvantages of *convertible bonds* to the investor?

(3 marks)

A convertible bond is essentially a bond which may be converted into shares by the investor. The advantages to the investor are that: they are very attractive and are often more marketable than non-convertible bonds; the conversion is only an option and need not be exercised if the shares fall in value; they tend to offer higher yields than the associated shares; and they have higher priority on liquidation in the case of financial distress. The disadvantages, however, are that the issuer may issue call options, and the lower yield on the bond element will be disappointing if conversion does not occur.

3. (a) The market index yielded 10% in recent years and you predict that it will offer a risk premium of 6% in the future. The standard deviation of market returns is 7% and the risk-free rate of return is 4%. Draw a diagram to show the Capital Market Line.

(1 mark)



(b) Which of the following three shares is over-valued given the base data in part (a) and each share's current returns performance and beta?

Share	Current rate of return on share	Share beta
X	6%	0.5
Y	10%	1.1
Z	15%	1.5

(3 marks)

X $r_i = 4 + 0.5\ (10 - 4) = 7.0\%$ thus over-valued
Y $r_i = 4 + 1.1\ (10 - 4) = 10.6\%$ thus over-valued
Z $r_i = 4 + 1.5\ (10 - 4) = 13.0\%$ thus under-valued

4. West plc grows at 6% per annum though it is expected that growth will stop after year 5. Indeed, in year 6 and thereafter it intends to pay out all of its earnings as dividends. If next year's earnings per share is 75p, next year's dividend is 50p, and the cost of equity capital is 9%, what is the share price for West plc?

(4 marks)

EPS in year 6 will be $0.75\ (1.06)^5 = £1.00$

Forecasted share price in year 5 will therefore be $1.00 / 0.09 = £11.11$

$$\begin{aligned}\text{Price} &= 0.50 / 1.09 + 0.53 / (1.09)^2 + 0.56 / (1.09)^3 + 0.60 / (1.09)^4 + 0.63 / (1.09)^5 \\ &\quad + 11.11 / (1.09)^5 \\ &= 0.46 + 0.45 + 0.43 + 0.43 + 0.41 + 7.22 \\ &= £9.40\end{aligned}$$

5. Explain what is meant by the expression 'term structure of interest rates'. Briefly outline two of the theories that attempt to explain this expression.

The term structure of interest rates is the relationship between yields offered on loans as the term to maturity increases i.e. it refers to the shape of the yield curve. There exist three theories which seek to explain the yield curve:

Expectations theory: the expectations of investors exert the most important influence on future interest rates. When the curve rises, investors expect higher rates in the future and defer buying long-dated stocks and buy short-dated ones instead – thus the price on short-dated stocks increases and lowers their yield, thereby increasing the yield on longer-dated stocks.

Liquidity preference theory: the longer an investor invests his/her money in loan stock, the higher the risk of illiquidity for the security and thus the higher the return required by the investor. After all, most investors are risk-averse and prefer greater liquidity.

Market segmentation theory: there are different segments of the market with different investment needs – for example, pension funds wish to invest long whereas banks may wish to invest short in order to maintain liquidity.

(4 marks)

6. (a) Define Macaulay duration.

(1 mark)

The duration of a bond is simply the weighted average length of time to the receipt of coupon and redemption value. The weightings here are the present value of the cash flows to the investor. Duration is a useful relative risk measure for bonds.

Macaulay duration for 4 years $= ((1xPV_1)+(2xPV_2)+(3xPV_3)+(4xPV_4)) / \text{Price}$

Where:
PV_t = present value of cash flow in year t

(b) A four year 8 per cent annual coupon bond redeemable at £100 trades with a gross redemption yield of 7 per cent. Calculate the *Macaulay duration* of the bond.

(3 marks)

Year	Cash flow to investor £	Discount factor	Present value £	Year x present value
1	8.00	0.934	7.47	7.47
2	8.00	0.873	6.98	13.96
3	8.00	0.816	6.53	19.59
4	108.00	0.763	82.40	329.6
Total			103.38	370.62

Thus duration = 370.62 / 103.38 = 3.59 years (or 3 years and 7 months)

7. QRS plc has borrowed at the floating rate of LIBOR plus 1.0% with a three month rollover. QRS's treasurer is worried that interest rates may move adversely and is therefore considering hedging the interest rate from the next rollover date. He has been offered a forward interest rate agreement (FRA) by his bank at 8% interest or a cap at 8% interest for a premium of 1.5% a year.

What is the effective interest rate that QRS plc will pay if it:
(a) Decides not to hedge;
(b) Arranges the FRA;
(c) Buys the cap,
under each of the following interest rate conditions: LIBOR moves to:
(i) 4.0%;
(ii) 6.0%;
(iii) 9.0%?

(5 marks)

LIBOR	(i) 4%	(ii) 6%	(iii) 9%
(a) Do not hedge (LIBOR + 1.5%)	5.0%	7.0%	10.0%
(b) FRA			
Interest rate paid	5.0%	7.0%	10.0%
Paid to bank/(refunded)	3.0%	1.0%	(2.0%)
Effective net interest	8.0%	8.0%	8.0%
(c) Cap			
Exercised?	No	No	Yes
Interest rate paid	5.0%	7.0%	8.0%
Premium cost	1.5%	1.5%	1.5%
Effective net interest	6.5%	8.5%	9.5%

(5 marks)

8. (a) Define Tobin's Q.

(2 marks)

Tobin's Q is the ratio of shareholder value to the replacement cost of assets. If assets are valued at their replacement costs then Tobin's q equals the price-to-book ratio. Another definition of this measure is as a measure of the rate of return spread, expressed as a ratio. If we hold constant the cost of capital (k) and the rate of return on the replacement cost of assets (Rrc), then shareholder value can be expressed as a capitalised constant profit stream:

Shareholder value = (Rrc x replacement cost of assets) / k

And thus Tobin's q = Rrc / k

The investment analyst might define Tobin's Q as the total market value of the firm divided by the replacement value of the firm's assets.

(b) Briefly explain how Tobin's Q might be employed by the investment analyst.

(1 mark)

Tobin's Q is a useful tool for the investment analyst who might employ it to gauge whether a company's shares are over- or undervalued. A low Q of between 0 and 1 means that the cost to replace a firm's assets is greater than the value of its shares (its market value) and thus the shares are undervalued. Conversely, a high Q which is greater than 1 signals that a firm's shares are more expensive than the replacement cost of its assets, which implies that the shares are overvalued.

9. (a) Explain what is meant by the term "*GDP deflator*" and why this concept should be of interest to the investor.

(2 marks)

The GDP deflator is a measure that can be employed to convert current prices GDP to constant prices GDP. It is essentially the weighted average of prices of all economic output in the economy (or expenditures by households, firms, governments and foreigners). The concept should be of interest to investors as the time value of money is a vital concept to a successful investment strategy – there is a time value to money which includes not just compensation and risk, but which also must cover inflation through time.

(b) The nominal GDP of a country in 2009 is £50bn and the GDP deflator for that year is 156. The base year for the deflator is 1995 at which time it was 100. Calculate real GDP in 2009.

(1 mark)

Real GDP in 2009 = (Nominal GDP in 2009 / GDP deflator) x Base year price Level

= (50,000,000,000 / 156) x 100

= £32.05bn

SECTION C **Total 30 marks**

10. Explain what is meant by an economic recession and discuss the impact of the current UK recession on economic agents.

An economic recession is broadly defined as two successive quarters of negative growth, that is, gross domestic product (GDP) contracts over a period of six months. In minor recessions, economic growth on a year-on-year basis slows but does not decline, whereas in a major recession economic growth on a year-on-year basis actually declines. The UK has not had a major recession since 1991, though it is almost certainly in one now.

The impact on the economy and government policy:

- GDP fell by 0.6% in the third quarter of 2008 and by 1.5% in the fourth quarter
- The government expects a continued contraction during 2009 and recovery in 2010
- The rate of inflation has fallen significantly to 3.0% by January 2009
- Oil and other commodity prices are expected to remain low due to suppressed consumer and business demand
- The budget deficit is likely to increase dramatically (up to 60% of GDP) as tax take falls and the fiscal stimulus rises
- Interest rates are reduced in an attempt by the Bank of England to stimulate growth (from 4.5% in October 2008 to 0.5% in March 2009)
- The Bank has also introduced quantitative easing measures to try to boost bank lending
- The government is engaging in a significant fiscal stimulus package in an attempt to kick start demand

The impact on business and the markets:

- Bankruptcies tend to rise for both individuals and companies
- Companies producing cyclically-sensitive goods and services have seen dramatic falls in demand
- UK companies which rely on their export markets have seen dramatic falls in demand for their products and services
- Stock markets are at a recent low and bond markets have experienced increased demand which has led to increased bond prices and historically low yields
- The financial sector contributes almost a third of the UK's GDP (Blue Book, 2008) and therefore the banking crisis has contributed significantly to the economic slowdown

The impact on consumers:

- Reduced consumer confidence and a greater propensity to save
- Unemployment tends to rise (now approximately 2 million and could rise to 3 million in near future), though unemployment is still less severe than in previous recessions
- Mortgage arrears and repossessions tend to rise
- Savers suffer as interest rates become very low

- In time, lower interest rates should encourage homeowners on variable rates to start spending again and thus stimulate demand
- House prices have corrected sharply downwards, leading to negative wealth effects
- Obtaining a mortgage is far more difficult and expensive for borrowers
- There is a possibility of future deflation as consumers revise their price expectations and "hold on" for expected lower future prices
- Psychological factors leading to pessimism and over-cautious spending

The impact on the global economy:

- International demand for goods and services, due to the global nature of the recession, has slowed and therefore countries which rely heavily on their export markets, such as Germany and China, have experienced dramatic falls in orders
- The IMF and World Bank have predicted that the global economy is also predicted to contract for the first time in decades during 2009

11. Discuss how price multiples may be used in the valuation of a company's shares and the relative merits of the price multiples model.

Price multiples models can be used to value a firm's equity. They are very simple because they do not require a large number of assumptions to work. The process for computing them is as follows. Firstly, choose an appropriate financial statement item such as book equity, book assets, sales, earnings, or cash flow. Secondly, estimate price multiples (such as the price-to-book-value-equity, price-to-book-value-assets, and so on) for comparable firms using your chosen value or performance measure. Thirdly, multiply the price multiple by the respective financial statement item of the firm under consideration, so for example, multiply the price-to-book-value-equity x book value equity of firm, to give us an estimate for the intrinsic value of the firm's equity. The technique can be applied at the level of the firm or at the per share level. For a guide as to which multiple ratios to compute, we should examine the types of multiple ratios most commonly quoted by the key financial databases. Similar firms are firms which have similar financing and types of operations, particularly firms in the same industry as the firm we are attempting to value.

Cornell's Comparable Companies Approach uses a number of different multiples simultaneously to value a company. Firstly, we must find comparable companies. Secondly, we must calculate a number of multiples ratios for these comparable companies. Thirdly, we need to calculate the mean of these ratios across the comparable companies. Fourthly, we apply these mean multiples to absolute data for company we wish to value, that is, multiply each mean ratio by the respective financial statement figure for the firm we wish to value. Finally, we can then take the mean of the ratios in the fourth step to produce a broader intrinsic value for the firm in question.

The advantages of the price multiples model are that: it is very simple to understand and apply; it focuses on current and forecast multiples which are easily available (or are easily estimated) for a firm and its industry; it relies on only a few parameters to arrive at intrinsic firm value; it helps us to think about how expensive or cheap a firm appears in relation to its competitors; and it can be used to value non-listed firms. The disadvantages of the model are, however that: managers can manipulate the accounts items on which multiples focus (particularly earnings); it uses a rule of thumb and

may not produce useful values where industries are diverse; it concentrates on a very narrow range of parameters and may not capture the fundamental determinants of firm value; and price multiples may be subject to significant variation over the cycle.

Using a multiples approach we can arrive at a value for a firm by multiplying the firm's earnings by the multiple which applies to its industry. However, it is often the case in the real world that analysts will use various earnings measures to arrive at the *enterprise value*, rather than the price per se, of the firm. Enterprise value is simply the value which a company would sell for on the market if it were put up for sale. Analysts will sometimes express enterprise value as a multiple of earnings, sales, assets, and so on. Enterprise value is the intrinsic value of the company's debt and equity.

Until recent years, many analysts computed a multiple of price in relation to after-tax earnings, focusing on the 'bottom-line'. However, particularly in times of economic slowdown, this figure can produce a price to earnings which looks very high on a prima facie basis. Analysts more recently would consider the use of net earnings in multiples valuation an inappropriate measure, particularly where firms are generating poor earnings in a particular phase of the business cycle.

EV/EBIT (enterprise value to earnings before interest and taxation) gives us a far better measure of the company's true value. It strips out the effect of differences in capital structure and tax position across companies and enables us to focus on the operating earnings or profits of the firm as a more consistent basis for valuation.

As well as the distortions of gearing and tax, firms can attempt to be creative and to stretch the period over which the their assets are to be depreciated or amortised, presenting some economic arguments to shareholders for doing so. This has the impact of reducing charges against profits, thereby artificially increasing EBIT. In response to this, EV/EBITDA (enterprise value to earnings before interest, taxation, depreciation and amortisation) strips out the impact of any change in depreciation and amortisation policy made by the company. It provides for the greatest consistency of valuation across firms by stripping out or reversing the impact of differences in tax policy, capital structure mix, and depreciation and amortisation policy.

12. Explain two *multi-factor asset pricing models* and discuss how they represent an important extension of the *Capital Asset Pricing Model (CAPM)*.

The *Capital Asset Pricing Model (CAPM)* is a simple model which helps us to explain the relationship between expected return and risk. It builds upon our understanding of basic portfolio theory. Unsystematic risk (specific to a firm, its projects, its industry) may be eliminated through diversification whereas systematic risk may not. Systematic risk relates to the risks faced by the whole market through, for example, changes in the macroeconomic environment. Certainly an investor might dramatically reduce systematic risk, investing solely in the risk-free asset, for example, though we assume that most investors accept such risk.

The CAPM attempts to explain how systematic risk affects expected returns on a share. The expression is as follows:

$E(r_i) = r_f + \beta\,(E(r_m) - r_f)$

Where:

$E(r_i)$ = expected return from security i

r_f = rate of return on the risk-free asset

β = beta of security i

$E(r_m)$ = expected return on the market portfolio

The CAPM is derived from the Capital Market Line (CML) which is merely a logical explanation of the relationship between risk and return for a rational investor: such an investor should hold the market portfolio plus the risk-free asset. The CAPM simplifies our analysis, as the only factor needed to distinguish expected returns across securities is the beta i.e. the degree to which a firm's expected returns covary with the expected returns of the market portfolio. As systematic risk cannot be diversified away, there are only increased rewards (returns) for bearing systematic risk. The CAPM is illustrated simply by plotting expected return against risk (beta) – greater risk is rewarded with higher returns. A security with no risk, intuitively is rewarded with the risk-free rate. As we increase the risk associated with a share we have to increase the return over and above the risk-free rate. Graphically, this plot is known as the Security Market Line.

The implications of the CAPM for the average investor are that they could construct a portfolio to provide their desired portfolio beta. A portfolio beta greater than unity will give rise to a better (worse) than average performance when the market is performing well but worse (better) than average performance when market returns fall.

There exist a number of extensions to the basic CAPM, including the Arbitrage Pricing Theory and the Fama and French three factor model. They all attempt to provide an explanation of the relationship between the risk and returns associated with shares.

The *Arbitrage Pricing Theory* also attempts to provide an alternative explanation of the relationship between expected return and risk. The model is essentially an extension of the CAPM as it considers several factors rather than just one. This macroeconomic-based risk factor model assumes that the risk premium on a share is determined by several factors (macroeconomic variables) and company-specific noise:

$r_i = a + b_1 r_{V1} + b_2 r_{V2} + \ldots +$ company specific variables

Where:

r_i = returns to company i's shares

b = sensitivity of share to V1

Vn = macroeconomic variables

However, the model does not tell us which V factors to use, though the original model employed non-anticipated variations in inflation, manufacturing output, and the risk premium, and changes in the yield curve. The risk premium then simply becomes the summed risk premiums on each variable:

$r_i - r_f = b_1(r_{V1}-r_f) + b_2(r_{V2}-r_f) + \ldots$

The model is applied by finding the relevant macroeconomic variables for a given share and then measuring how sensitive the share is to those variables. Intuitively, a security with b coefficients of zero will return the risk-free rate and increasing sensitivity gives rise to an increased premium. Investors can adjust b values to achieve the desired level of risk in their portfolios.

The *Fama and French* (1993) three factor model is a microeconomic-based risk factor model which employs certain individual share measures. Their model is specified as follows:

$$(R_{jt} - RFR_t) = \alpha_j + \beta_{j1} (R_{Mt} - RFR_t) + \beta_{j2}SMB_t + \beta_{j3}HML_t + \varepsilon_{jt}$$

Thus, this includes not only the excess return on the market portfolio (difference between the market return and the risk-free rate) but also

i) SMB (small minus big factor) which is the return on a portfolio of small capitalisation shares less the return on a portfolio of large capitalisation shares;

ii) HML (high minus low factor) which is the return on a portfolio of high MTB (market-to-book ratio) shares less the return on a portfolio of low MTB shares.

Quite simply, SMB captures risk related to firm size whereas HML captures risk differences related to growth. These two new factors were introduced as evidence showed subsequent to the development of the CAPM that they have an important impact on share performance. Other authors such as Carhart (1997) extended the Fama and French model to include a momentum factor to account for the fact that firms with positive past returns tend to produce positive future returns.

13. Explain the nature of *quantitative easing* and how it differs from the conventional tools of monetary policy.

The objective of monetary policy is to control the supply of money and/or limit the demand for money so that as the economy grows inflation does not grow disproportionately. In the UK we are in the interesting but unfortunate position of observing a wide variety of monetary policy measures in action in recent months, from interest rate cuts to quantitative easing as a means of addressing the effects of the "credit crunch". There are numerous tools potentially available to a central bank to help it to either directly control money supply or indirectly limit the demand for money by changing interest rates. Conventional tools include direct controls, funding policy, control over interest rates, reserve requirement ratios, central bank lending to banks, and open market operations.

Direct controls may be employed by the central bank on bank lending. Such controls may apply to the type of lending e.g. limit lending to households or increase lending to certain types of business. Alternatively, quantitative controls may be imposed – these could be imposed on bank deposits or bank lending. *Funding policy* aims to control the liquidity in the banking system. If the central bank sells more bonds and less bills to the banking system then it can directly reduce the liquidity in the banking system and therefore the ability of banks to extend their lending. *Control over interest rates* is probably the most important monetary control exercised by central banks. Monetary tightening through interest rate increases reduces aggregate demand in the economy whereas monetary loosening through interest rate cuts increases aggregate demand. The central bank can announce a particular interest rate and then engage in open market operations to ensure that money supply adjusts to ensure the intended equilibrium rate. However, more recently, the Bank of England has run out of flexibility in its control over interest rates as rates were reduced to 0.5%, the lowest rate in their history. *Reserve requirement ratios* are effectively minimum ratios of cash and other liquid assets which commercial banks are required to hold. If the central bank increases these ratios, this restricts the ability of banks to lend and their ability to increase the money supply (through the bank credit multiplier). *Central bank lending to banks* also impacts directly on the money supply (liquidity in the banking system). If the central bank increases the repo rate (usually below the market rate) then it can restrict the amount of bank borrowing and reduce the money supply. Alternatively, the central bank could reduce its repurchase of government securities to squeeze the liquidity in the system. Finally, *open market operations* involves the sale and purchase of government securities such as treasury bills and bonds in the open market. Selling more government securities reduces liquidity in the market whereas purchasing them introduces more liquidity in the market. The emphasis until recently has been on selling government securities to reduce liquidity in the banking system as the central bank has been focused solely on its inflation target.

More recently, the Bank of England has announced a £75 billion programme of *quantitative easing*. Quantitative easing (QE) is the creation of new money within the banking system by the central bank. This increases the value of deposits in banks which can then be lent on. More specifically, the central bank buys up assets such as government bonds and corporate bonds using money it has effectively "created into being". Banks and other financial institutions then have new funds in their accounts which should increase the money supply through the deposit multiplier. Alternatively, the central bank could buy government bonds on the open market or even lend new money directly to banks. The hope is that the yields on debt instruments and in particular inter-bank debt fall and therefore the spread for lending to others increases, thereby encouraging greater lending.

QE is portrayed by the press as "printing money", but this is an over-simplified description of the operation. When the central bank buys gilts from banks, for example, then the increased money supply can lead fairly directly to increased lending volumes. Further, as the supply of gilts falls, their price rises and their yield falls. As the interest rates on a range of loan products, such as fixed rate mortgage deals, overdrafts, and corporate lending, are tied directly to gilt yields then borrowing is encouraged as a result. The effect of QE is to increase the size of the central bank's balance sheet by increasing base money. Quantitative easing can be employed in conjunction with "*qualitative easing*" (where there is a change in the composition of the central bank's assets towards riskier/less liquid assets without changing the size of the balance sheet). To make QE even more effective, the Bank may well seek to reduce not just short-term interest rates but longer term rates as well by changing the maturity of instruments they are willing to purchase.

Whether the quantitative easing approach will work within the UK banking system depends on a number of factors. Firstly, it can be highly inflationary if not done carefully. However, this Bank policy is a response to the risk of deflation rather than the government itself printing money to fund a deficit. Secondly, the policy may not be aggressive enough, in which case the "credit crunch" will persist and the lending environment will remain very difficult. It is likely to take some time for QE to work through to an easier credit environment and for recent interest rate cuts to feed through into increased economic activity.

14. With reference to the current problems in the international financial sector, together with you own knowledge, discuss the implications of the proposition that some companies are "too big to fail".

A "bailout" is the granting of loans or the giving funds to a failing company to save it from bankruptcy or insolvency. In the context of this question, the party granting the loan or giving the funds is the Government, and as such the funds are ultimately "given" by the taxpayer. The proposition that some companies are "too big to fail" is implicit in the actions of a number of western Governments since the onset of the current financial crisis. The international financial sector has experienced some significant bailouts since the onset of the subprime financial crisis. In the UK, three of the most marked examples are Northern Rock, Lloyds Banking Group and the Royal Bank of Scotland. Many commentators argue that, given the importance of banking to the financial system and the orderly operation of all industries, larger banks are simply too big and too important to fail.

Northern Rock became an early casualty of the subprime financial crisis as its business model was fundamentally flawed. It relied too heavily on short-term money

markets rather than the funds of depositors to support its lending, a situation which came to a head when interbank lending froze. A series of events, including a run on the bank, ultimately led to the UK Government stepping in to nationalise the bank in early 2008.

In November 2008, Lloyds TSB took over ailing HBOS to become Lloyds Banking Group. In October 2008, the UK Government stepped in to bailout a large part of the UK banking sector, injecting £37 billion of new capital into a number of banks, giving UK taxpayers a 43% stake in the bank. HBOS then declared an enormous loss of £11 billion, leading to the Government increasing its ownership to 65% of the merged bank.

From 2000 onwards, the Royal Bank of Scotland acquired NatWest and then took part in a consortium acquisition of ABN AMRO in October 2007, and many financial commentators believe that the bank overpaid significantly at the time. To rebuild it's balance sheet after significant write-downs following the sub-prime crisis, RBS announced a rights issue in April 2008 of £12 billion, though the issue ultimately failed. In October 2008, the UK Government bailed out RBS, along with other banks, resulting in the taxpayer owning a 57% stake in the company. In January 2009, the Government injected further funds to take public ownership of the bank up to 70%.

Banks are arguably a special case when it comes to Government bailouts. The advantages of bank bailouts include: the Government now has some oversight over a large part of the banking sector at a time of great market volatility and change; the banks bailed out should not fail and therefore the position of depositors and other stakeholders such as employees is safer; certain corporate entities are just 'too big to fail' – the concern over systemic failure has subsided; it protects jobs in a sector which is of fundamental importance to the economy; and, at some future point, as long as the banking market recovers, the Government can sell the bank's shares and "repay the public purse". However, the disadvantages of such bailouts include: it leads to various distortions of the free market – winners should be free to thrive whilst losers should be allowed to die; it incentivises risk to some extent as moral hazard is created; it replaces corporate management (efficient) with government management (inefficient); and, some US commentators and politicians have even suggested that it hails the beginnings of "creeping socialism".

Other industries which have experienced bailouts across the world include transportation, oil, and the auto industry. In the US, for example, there has been significant debate over whether the Government should bail out the "Big Three" auto producers. Supporters of bailouts here point to the millions of jobs which rely on the auto companies continued existence whereas critics point to the effective incentivisation of risk and creation of moral hazard. The issue of bailout ultimately rests on where your stance is regarding the trade-off between social and corporate welfare. Certainly, there is a strong social welfare argument involved, though perhaps Governments could achieve this more directly and effectively through, say, unemployment benefits rather than by bailing out the corporate sector. A fairly convincing argument remains, however, for support of the banking sector as ignoring the problem and letting large banks fail might lead to systematic failure and subsequent very slow economic recovery.