BEFM014

UNIVERSITY OF EXETER

SCHOOL OF BUSINESS AND ECONOMICS

JUNE 2009

INVESTMENT RESEARCH METHODS 2

Module Convenor: Jamie Stevenson

Duration: TWO HOURS

Answer THREE questions in total, of which:
ONE must be taken from **Part A** and TWO must be taken from **Part B**.

All questions carry a maximum of 100 marks.
Total marks awarded out of 300 are scaled to 100 percent.

Only silent, non-programmable calculators permitted.

This is a closed note exam.

Critical Values of the T-Distribution
Critical Values for alpha equals
Tables at end of Question 1

PART A

QUESTION 1

Answer all parts of this question

(i) It is argued that the underwriters to a company wishing to issue new shares are cautious in advising the company about the price at which to issue the shares, because any unsold shares must be purchased by the underwriters themselves at the issue price. This implies that the price of the shares a few days after the issue should be above the issue price.

New share performance
15th November 2004

Recent issue	Date of issue	Issue price (pence)	Current price (pence)
Clearstream	11 Nov	79	83.00
Afircqan Copper	11 Nov	76	79.00
Lodore Resources	10 Nov	5	11.25
Europa Oil & Gas	10 Nov	25	32.50
Phoenix IT	10 Nov	235	234.75
Cello	08 Nov	100	104.50
Mavinwood	04 Nov	10	12.00
Caspian Holdings	03 Nov	23	25.50
Subsea Resources	03 Nov	20	20.50

Source: *Financial Times* 15th November 2004

(a) For each issue, compute the change of the current price over the issue price. (5 marks)

(b) Estimate the mean and standard deviation of the nine changes in the issue price. (5 marks)

(c) Assuming that this is a small sample, compute a 95% confidence interval for the mean change of the current price over the issue price. (5 marks)

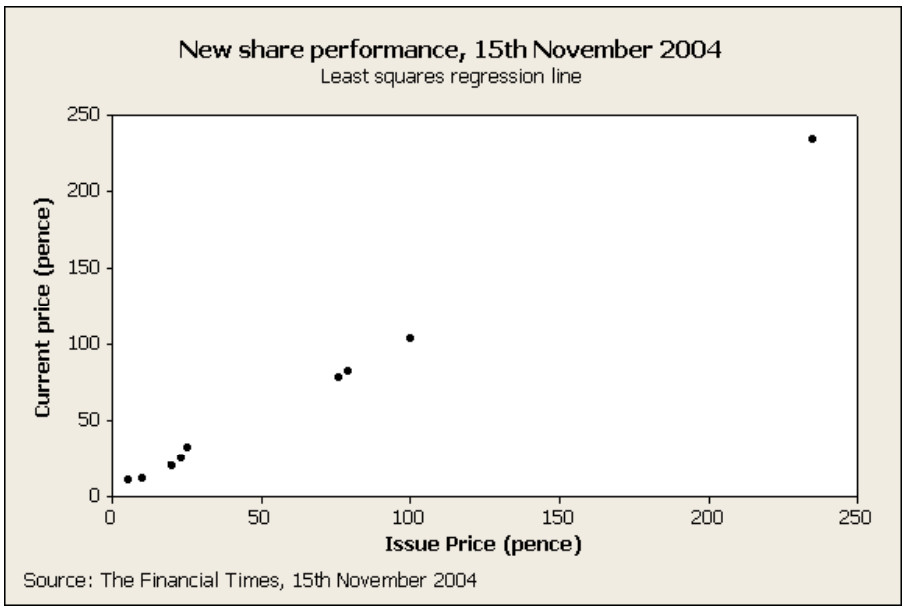
(d) If the confidence interval includes the value zero, what can we conclude about the behaviour of underwriters? And what can we conclude if it does not? (5 marks)

(ii) For the data given in part (i) let

y be the current price of the share on 15th November 2004, and

x be the issue price of the share.

Plotting these data gives the following scatter diagram.



The least squares regression is

$$\hat{y}_t = \underset{(-1.095)}{4.336} + \underset{(0.1169)}{0.98425}x_t \qquad R^2 = 0.9990 .$$

Note: Standard errors of the coefficients are shown in brackets under the coefficient to which they are attached.

(a) What evidence is there for a linear relationship between the price of a new share a few days after issue and the issue price of the share? (5 marks).

(a) Determine if the estimated slope of the regression is significantly different from unity. (10 marks).

(c) Estimate what the current price of a share issued at 5 pence will be a few days after issue, and what the current price of a share issued at 500 pence will be a few days after issue. (5 marks).

(d) On this evidence, argue the case for, or against, the statement that

"Highly-priced new issue shares are overvalued by underwriters but low-priced new issue shares are undervalued by underwriters". (10 marks)

Turn over/…

(iii) A.L. Bowley in *Studies on National Income Accounting* observes that employment in agriculture (`Lt`) fell over the 15 year period from 1924 to 1938, but gross agricultural output (`Yt`) remained unchanged. He argues that, other things being equal, this implies decreasing returns to labour and increasing returns to the other inputs in the agricultural process.

Bowley gives sufficient data to compute monetary values for ex-farm inputs of seeds and plants, feeding stuffs and fertiliser inputs (`St`).

The units of measurement of all variables are in £ million in current prices, except for employment which is measured in thousand persons. The regression result from the Minitab statistics package using as the dependent and predictor variables the natural logarithms of these data is given below.

```
Dependent variable: Ln(Yt)

Predictor      Coef     Stdev   t-ratio       p
Constant     1.5695    0.7400      2.12   0.055
Ln(Lt)       0.2942    0.1109      2.65   0.021
Ln(St)      0.49044   0.06464      7.59   0.000

R-sq = 0.865   R-sq(adj) = 0.843
Durbin-Watson statistic = 0.858
```

(a) Test the hypothesis of no first-order serial correlation (autocorrelation) against the alternative most common in economics. (10 marks)

(b) What are the implications of the result of your test in part (a)? (10 marks)

(iv) Polycarp Musinguzi and Peter Smith in "Structural adjustment and poverty: A study of rural Uganda", Discussion Papers in Economics and Econometrics, No 9813, University of Southampton argue that:

> "The causes of poverty are myriad, but in the context of an economy such as Uganda, four categories of factors can be identified: poor command over assets, poor access to markets, the vulnerability of some groups as a result of household characteristics and geographical factors"

They have data from the Bank of Uganda survey collected by interviews using a systematic/cluster sampling basis. Average monthly income is 13707 Ugandan shillings (US$ 11.95). The independent variables in the regression are defined as follows:

Landholding is measured in acres. 65% operate on plots of 2 acres or less.
Education is the number of years of schooling, typically between 4 and 7 years.
Distance to the local market is measured in miles.
Female head is a dummy variable, with the value 1 if the head of the household is female and 0 if the head of the household is male.
Household size is the size of the household, which varies from single person households up to 28 person households, the mean household size being 6.6 persons.
There are four 'Standard Regions' in Uganda; two of these are the *Eastern region* and the *Northern region*.

Regression analysis

Dependent variable: Income	Coefficient	Two tail p-value
Intercept	12.777	0.0000
Landholding	0.093	0.0432
Education	0.294	0.0008
Distance	-0.384	0.0000
Female head	-0.324	0.0882
Household size	-0.680	0.0000
Eastern region	-0.450	0.0037
Northern region	-1.151	0.0000
Observations	247	
R^2	0.319	

Turn over/…

(a) What interpretation oo you place upon the coefficient on the Female head dummy variable and on the coefficients of the Eastern region and Northern region dummy variables? (10 marks)

(b) Test the hypothesis that jointly **all** the slope coefficients are zero. (10 marks)

(c) Does the regression result confirm the general argument put forward by Musinguzi and Smith? (10 marks)

CRITICAL VALUES OF THE T-DISTRIBUTION

Entries in the table give the upper percentage points of the T distribution. For example with $\upsilon = 10$ degrees of freedom, $P(T > 2.228) = 0.025 = \alpha$.

	α					
υ	0.050	0.025	0.010	0.005	0.001	0.0005
1	6.314	12.706	31.821	63.657	318.31	636.62
2	2.920	4.303	6.965	9.925	22.327	31.598
3	2.353	3.182	4.541	5.841	10.214	12.924
4	2.132	2.776	3.747	4.604	7.173	8.610
5	2.015	2.571	3.365	4.032	5.893	6.869
6	1.943	2.447	3.142	3.707	5.208	5.959
7	1.895	2.365	2.998	3.499	4.785	5.408
8	1.860	2.306	2.896	3.355	4.501	5.041
9	1.833	2.262	2.821	3.250	4.297	4.781
10	1.812	2.228	2.764	3.169	4.144	4.587
11	1.796	2.201	2.718	3.106	4.025	4.437
12	1.782	2.179	2.681	3.055	3.930	4.318
13	1.771	2.160	2.650	3.012	3.852	4.221
14	1.761	2.145	2.624	2.977	3.787	4.140
15	1.753	2.131	2.602	2.947	3.733	4.073
16	1.746	2.120	2.583	2.921	3.686	4.015
17	1.740	2.110	2.567	2.898	3.646	3.967
18	1.734	2.101	2.552	2.878	3.610	3.922
19	1.729	2.093	2.539	2.861	3.579	3.883
20	1.725	2.086	2.528	2.845	3.552	3.850
21	1.721	2.080	2.518	2.831	3.527	3.819
22	1.717	2.074	2.508	2.819	3.505	3.792
23	1.714	2.069	2.500	2.807	3.485	3.767
24	1.711	2.064	2.492	2.797	3.467	3.745
25	1.708	2.060	2.485	2.787	3.450	3.725
26	1.706	2.056	2.479	2.779	3.435	3.707
27	1.703	2.052	2.473	2.771	3.421	3.690
28	1.701	2.048	2.467	2.763	3.408	3.674
29	1.699	2.045	2.462	2.756	3.396	3.659
30	1.697	2.042	2.457	2.750	3.383	3.646
35	1.690	2.030	2.438	2.724	3.340	3.591
40	1.684	2.021	2.423	2.704	3.307	3.551
45	1.679	2.014	2.412	2.690	3.281	3.520
50	1.676	2.009	2.403	2.678	3.261	3.496
55	1.673	2.004	2.396	2.668	3.245	3.476
60	1.671	2.000	2.390	2.660	3.232	3.460
65	1.669	1.997	2.385	2.654	3.220	3.447
70	1.667	1.994	2.381	2.648	3.211	3.435
75	1.665	1.992	2.377	2.643	3.202	3.425
80	1.664	1.990	2.374	2.639	3.195	3.416
85	1.663	1.988	2.371	2.635	3.189	3.409
90	1.662	1.987	2.368	2.632	3.183	3.402
95	1.662	1.987	2.368	2.632	3.183	3.396
100	1.660	1.984	2.364	2.626	3.174	3.391
∞	1.645	1.960	2.326	2.576	3.090	3.291

Turn over/…

CRITICAL VALUES OF THE DURBIN-WATSON D STATISTIC

Entries in the table give the 5% significance points of the Durbin-Watson D statistic in one-tailed tests. With $n = 10$ observations, $k' = 1$, explanatory variable (excluding the constant) $P(D \leq 1.320) = 0.05 = \alpha$ at one extreme of the data matrix and $P(D \leq 0.879) = 0.05 = \alpha$ at the other.

	k'									
	1		2		3		4		5	
n	d_L	d_U	d_L	d_U	d_L	d_U	d_L	d_U	d_L	d_U
10	0.879	1.320	0.697	1.641	0.525	2.016	0.376	2.414	0.243	2.822
15	1.077	1.361	0.946	1.543	0.814	1.750	0.685	1.977	0.562	2.220
20	1.201	1.411	1.100	1.537	0.998	1.676	0.804	1.828	0.792	1.991
25	1.288	1.454	1.206	1.550	1.123	1.654	1.038	1.767	0.953	1.886
30	1.352	1.489	1.284	1.567	1.214	1.650	1.143	1.739	1.071	1.833
35	1.402	1.519	1.343	1.584	1.283	1.653	1.222	1.726	1.160	1.803
40	1.442	1.544	1.391	1.600	1.338	1.659	1.284	1.721	1.230	1.786
45	1.475	1.566	1.430	1.615	1.383	1.666	1.336	1.720	1.287	1.776
50	1.503	1.585	1.462	1.628	1.421	1.674	1.378	1.721	1.335	1.771
55	1.528	1.601	1.490	1.641	1.452	1.681	1.414	1.724	1.374	1.768
60	1.549	1.616	1.514	1.652	1.480	1.689	1.444	1.727	1.408	1.767
65	1.567	1.629	1.536	1.662	1.503	1.696	1.471	1.731	1.438	1.767
70	1.583	1.641	1.554	1.672	1.525	1.703	1.494	1.735	1.464	1.768
75	1.598	1.652	1.571	1.680	1.543	1.709	1.515	1.739	1.487	1.770
80	1.611	1.662	1.586	1.688	1.560	1.715	1.534	1.743	1.507	1.772
85	1.624	1.671	1.600	1.696	1.575	1.721	1.550	1.747	1.525	1.774
90	1.635	1.679	1.612	1.703	1.589	1.726	1.566	1.751	1.542	1.776
95	1.645	1.687	1.623	1.709	1.602	1.732	1.579	1.755	1.557	1.778
100	1.654	1.694	1.634	1.715	1.613	1.736	1.592	1.758	1.571	1.780
150	1.720	1.746	1.706	1.760	1.693	1.774	1.697	1.788	1.665	1.802

QUESTION 2

Answer all parts of this question

(i) State the growth accounting equation. Given the share of capital stock to output is $\alpha = 0.4$, then compute the percentage growth in output if

(a) The percentage growth in the capital stock is 2 per cent.

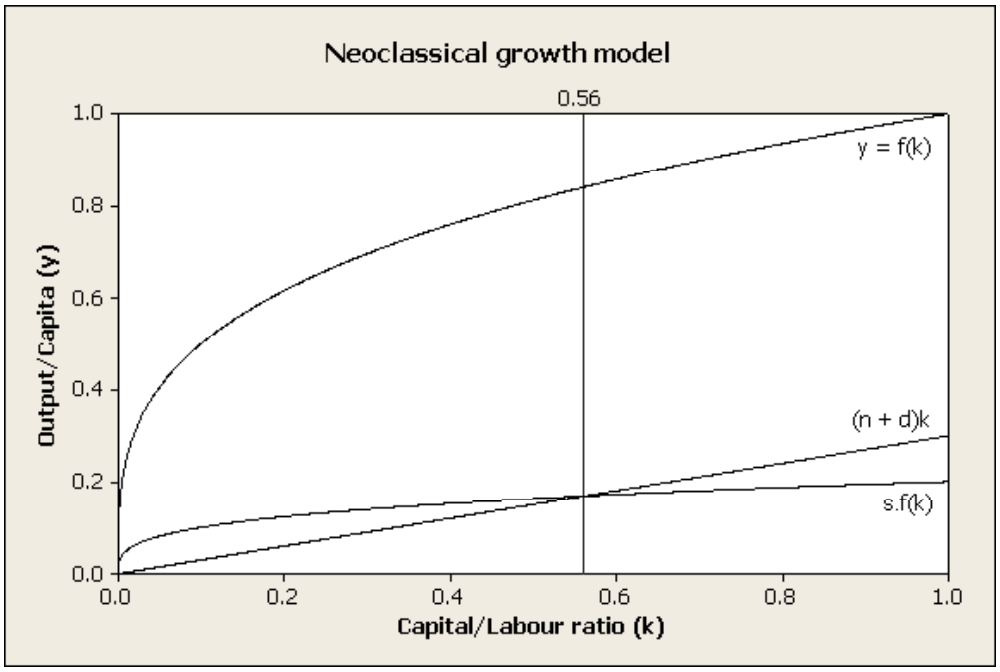
(b) The percentage growth in the labour force is 3 per cent.

(c) The percentage growth in total factor productivity (technology) is 2 per cent.

(d) Conditions (a), (b) and (c) applied at the same time.

If the percentage growth in output is 3.5 per cent, the growth in the capital stock is 2 percent and the growth in the labour force is 3 per cent, compute the (residual) part of the growth in output which is not accounted for by capital and labour growth. What explanation is there for a residual such as this? (30 marks)

(ii) The neoclassical growth model is illustrated in the following diagram,



where $y = Y/N$ is output per capita (in nominal financial units), $k = K/N$ is the capital stock per capita (in nominal financial units per person), n is the rate of growth of the population, d is the rate of depreciation on capital stock and s is the proportion of output not consumed.

Turn over/…

(a) Identify the key assumptions that the neoclassical growth model makes about the nature of the economy? (10 marks)

(b) Explain why long run equilibrium of output per head is given by $s \times f(k) = (n + d)k$. (10 marks)

(c) Separately consider what are the effects on equilibrium consumption per head

if the savings ratio is decreased;
if the rate of growth of the population decreases;
if the length of the working day is increased;
if some of the capital stock of the economy is destroyed? (20 marks)

(d) Describe the main differences between the endogenous growth model and neoclassical growth model. (10 marks)

(iii) Argue for, or against, the view that the Neoclassical growth model contributes to understanding the impact on the growth of the UK economy of the current financial crisis of 2008/9. (20 marks)

PART B

QUESTION THREE

i. What is the difference between a Defined Contribution (DC) and a Defined Benefit (DB) pension scheme? Which type of scheme gives to the employee greater certainty about his future pension rights, and why? Which type of scheme gives to the employing company greater certainty about its future pension obligations? Why has there been a decrease in the number of DB schemes offered to new employees by companies over the past ten years? What have been the main social, demographic and financial trends contributing to this decrease? (20 marks)

ii. Under a DB scheme, define the three different methods of estimating the value of the company's obligation to make future pension payments. Identify the method which is used in almost all calculations of the company's pension liabilities and expense, and explain why this is the most appropriate method. (10 marks)

iii. Identify five assumptions upon which this method of estimating the value of the pension obligation depends, and explain how each contributes to the likely future cost of pension payments. Pick out the two most critical assumptions. Explain why they are likely to have the strongest influence on the estimate, and how rises & falls in these two assumptions will affect the estimate of the pension obligation. (20 marks)

iv. There are five main components to the change during a company's financial year between the opening and closing estimate of the pension obligation – service cost, interest cost, actuarial gains & losses, prior service costs and benefits paid. Define each of these five components. Explain the distinction between the interest and service cost element of each year's increase in pension obligation. Explain why adjustments need to be made each year for actuarial gains & losses, and for prior service costs. (15 marks)

Turn over/…

v. There are also five components to the calculation of the annual pension expense in the income statement – service cost, interest cost, actuarial gains & losses, prior service costs and return on fund assets. Why are 'benefits paid' not included in the annual pension expense? What is the annual pension expense seeking to measure, and how does this differ from the annual change in the pension obligation? Explain the role of 'smoothing' in this calculation of the pension expense. (15 marks)

vi. How is the economic status of the pension fund measured? How does this differ from the accounting status? Why were companies, prior to SFAS 158, guided to use accounting rather than economic status? And why has SFAS 158 changed this? Which do you regard as the more appropriate approach likely to give a true and fair value of a company's net pension assets or liabilities? (20 marks)

QUESTION FOUR

On 1st January 2005, UK-based Bodmin Mining plc purchases a 25% stake in Fernandez Minerals, registered in the small Latin American state of Parazuela but listed on the New York Stock Exchange, for US$20m. Bodmin states that this is a strategic stake and that it will consider adding to or reducing its holdings in response to future opportunities. Local regulations allow only Parazuelan nationals to join the boards of locally registered companies. Bodmin has no local representatives in Parazuela. In the financial year to 31st December 2005, Fernandez Minerals reports US$20m net income and makes US$4m dividend payments to shareholders. The market price of shares in Fernandez doubles between 1st January and 31st December 2005.

(i) Should Bodmin account for its holding in Fernandez:

a. Using the cost method on a Held-for-Maturity basis
b. Using the equity method
c. Using the market method on a Held-for-Trading basis
d. Using the market method on an Available-for-Sale basis

Explain the reasons for your answer to (i) above. (15 marks)

(ii) For the year to 31st December 2005, will Bodmin report net income from Fernandez closest to:

a. US$5m
b. US$1m
c. US$25m
d. US$21m

Explain the reasons for your answer to (ii) above. (15 marks)

(iii) In its balance sheet at 31st December 2005, will Bodwin value its holding in Fernandez at:

a. US$20m
b. US$25m
c. US$40m
d. US$21m

Explain the reasons for your answer to (iii) above. (15 marks)

On 1st January 2006, Bodmin takes its stake in Fernandez to 50% by acquiring a further 25% for US$40m. The remaining 50% of shares in Fernandez are purchased by Parazuela's leading oil company PetroPara. The Fernandez shares are de-listed from the New York stock exchange and Fernandez becomes a 50-50 joint venture between Bodmin and PetroPara. Local regulations are altered to permit foreign board members and Bodmin takes up half the places on the board of Fernandez. In the year to 31st December 2006, Fernandez reports US$30m net income and pays US$6m dividends.

Turn over/…

(iv) Under international accounting standards, should Bodmin account for its stake in the Fernandez joint venture:

a. Using the market method on an Available-for-Sale basis
b. Using consolidation
c. Using the equity method
d. Using partial consolidation

Explain the reasons for your answer. (15 marks)

Do you agree with the accounting treatment recommended by international standards. If so, explain why this is the most appropriate treatment. If not, explain why you think a different treatment might be more appropriate (10 marks)

(v) In the year to 31st December 2006, will Bodmin report net income from Fernandez of :

a. US$10m
b. US$3m
c. US$43m
d. US$15m

Explain the reasons for your answer. (15 marks)

(vi) In its balance sheet at 31st December 2006, will Bodmin value its holding in Fernandez at:

a. US$60m
b. US$80m
c. US$72m
d. US$75m

Explain the reasons for your answer (15 marks)

QUESTION FIVE

i. What is the purpose of accrual accounting? How does this differ from cash accounting? (10 marks)

ii. Which is likely to give the most accurate measure of the company's financial performance, and why?

(10 marks)

iii. Which is likely to give a better indicator of the company's sustainable, or 'persistent', performance? And why?

(10 marks)

iv. Which is likely to be more susceptible to manipulation? And why?

(10 marks)

v. Name and describe three ways in which revenue recognition is often manipulated on income statements.

(15 marks)

vi. Name and describe three ways in which expenses recognition is often manipulated on income statements.

(15 marks)

vii. Name the three categories of Cash Flow and define the components of each. Which of these (or which combination) is likely to offer the most reliable measure of 'sustainable' cash flow? Explain why, itemising the activities which require to be funded in order to sustain a business on a going concern basis. (15 marks)

viii. What tests under US GAAP must a company meet in order to classify the capital value of its operating leases off balance sheet?

(5 marks)

ix. What tests under US GAAP must a company meet in order to be allowed to classify a Variable Interest Entity (VIE) off its balance sheet? Are these tests tight enough to prevent a company from hiding significant liabilities?

(10 marks)

Turn over/…

QUESTION SIX

i. Despite tighter US GAAP and IFRS rulings since the Enron scandal in 2002, investors have been shocked by the over-reporting of income and under-reporting of liabilities which have led up to the collapse of Lehmann Brothers, Bear Stearns, AIG and other major financial institutions. Explain and illustrate with examples the 'creative' accounting methods which managements can use both to inflate income and to obscure true liabilities. (75 marks)

ii. In your view will mechanisms such as IFRS create a more consistent and transparent financial reporting framework in which rational investors from around the world can be confident that financial statements are comparable and no longer disguising creative accounting practices? Illustrate your answer with some examples.

(25 marks)

End of Exam