

國立臺北商業技術學院 98 學年度研究所碩士班考試入學試題

准考證號碼：□□□□□□ (請考生自行填寫)

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注意事項	1. 本科目合計 100 分，答錯不倒扣。 2. 請於答案卷上依序作答，並標註清楚題號 (含小題)。 3. 考完請將答案卷及試題一併繳回。
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- 一、(一)假設一年期的折現因子為 0.85，二年期的折現因子為 0.89，請問是否存在套利機會？若無套利機會，請證明；若有套利機會，請說明如何套利。(7分)
- (二)假設一年複利一次。已知一年期即期利率為 5%，第一年至第二年的遠期利率為 0.05%，請問是否存在套利機會？若無套利機會，請證明；若有套利機會，請說明如何套利。(7分)
- 二、已知台指選擇權為歐式選擇權：
- (一)假設你賣出四月到期、履約價格為 5,100、5,300 的賣權各一口，買入四月到期、履約價格 5,200 的賣權兩口(亦即以賣權操作賣出蝶式策略)。在不考慮期初的現金流量下，試以報價為縱軸、到期標的物價格為橫軸作圖。(6分)
- (二)(續第一小題)假設無套利機會，你認為上題期初是現金流入或流出？為什麼？請以第一小題的圖形回答。(6分)
- (三)(續第一小題)若你用相同條件下的買權來操作賣出蝶式策略，請問期初的現金流量和第一小題相較為何？請以兩者到期報價對到期標的物價格之作圖回答。禁止以歐式買賣權平價定理 (Put-Call Parity) 回答此小題。(7分)
- 三、假設美國十年期政府公債的殖利率為 2.63%，十年期美國抗通膨公債 (Treasury Inflation Protection Securities)的殖利率為 2.00%。若你只有上述資訊，且今日物價指數為 100，試預估十年後之物價指數為何？為什麼？(7分)
- 四、假設經濟體系中有 N 個風險性資產，試簡要且精確地說明如何建構效率前緣 (Efficient Frontier)。(10分)

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五、NTCB Inc. has the following capital structure, which it considers to be optimal:

Current Liabilities	\$25,000,000
Long-term liabilities	164,000,000
Equity	126,000,000

In addition, NTCB Inc. has compiled the following financial data:

EBIT	=\$105,000,000	Dividend payout ratio	=50%
Profit margin	=8%	Cost of debt before tax	=8%
Total asset turnover	=2	Corporate tax rate	=40%

- (一) Assume the NTCB Inc. has a constant dividend payout ratio and a constant debt-to-equity ratio. The firm is currently operating at full capacity. What is the maximum growth rate the firm can achieve without any external equity financing? (5%)
- (二) Assume the NTCB Inc. has a constant dividend payout ratio and a constant profit margin. The firm is currently operating at full capacity. What is the maximum growth rate the firm can achieve without any external equity financing? (5%)
- (三) Assume the NTCB Inc. has a constant dividend payout ratio and a projected sales increase of 10%. All costs, assets, and current liabilities vary directly with sales. The firm is operating at full capacity. What is the external financing needed? (5%)
- (四) If the weighted average cost of capital (WACC) is 10%, what is its cost of equity? What is its unlevered cost of equity capital? (5%)

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六、You are approached to bid on a contract to sell 10,000,000 DVD-R to Microsoft per year for the next five years. The equipment necessary for the production will cost \$3,846,000,000 and will be depreciated on a straight-line basis to a zero salvage value over the project's five-years. Production will need \$500,000 in initial net working capital, which will be returned at the end of the project. The equipment can be sold for \$800,000 at the end of the production. The production costs are \$5 per unit, and the fixed cost is \$900,000 per year. If the tax rate is 40% and the required return on this project is 12%, what bid price should you submit on the contract? [$PVIFA_{12\%,5}=3.60478$; $PVIF_{12\%,5}=0.56743$] (10%)

七、NTCB Inc. predicts that earnings in the coming year will be \$75 million. There are 12 million shares outstanding. NTCB has a debt-to-equity ratio of 1.5 and its WACC is 10%.

(一) Calculate the maximum investment funds available without issuing new equity and the increase in borrowing that goes along with it. (5%)

(二) NTCB Inc. has evaluated six potential investment projects for the coming year. All projects are independent and are of average risks.

Investment	Cost	Life	IRR
A	15 million	5	11.5%
B	22 million	5	9.5%
C	20 million	5	12%
D	27 million	5	13%
E	40 million	5	7%
F	10 million	5	11.2%

Suppose the company follows a residual dividend policy. Based on this information, what will the dividend per share be? How much in new debt was borrowed? (5%)

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八、 Suppose the annualized interest rates in the U.S. and the Eurozone are 1.2% and 0.6%, respectively. The current spot and 1-year forward exchange rates on the euro are US\$1.3317 and US\$1.3420, respectively.

(一) Is there an arbitrage opportunity? If so, how would you exploit it? (5%)

(二) At what 1-year forward rate will interest rate parity hold? (5%)

試題結束