



UNIVERSITY OF COLOMBO

FACULTY OF ARTS

MASTER OF FINANCIAL ECONOMICS 2017

Final Examination – Semester II

MFE06 – Financial Markets

Time Allowed: Three (03) hours

Answer only 05 Questions

The Questions are based on the Case Study Provided.

Question 1

(Based on Exhibit 2 of the Case Study)

- A. Discuss the characteristics of a Convertible Bond. Calculate the initial conversion price and the Conversion Premium offered when the Tesla convertible bond was issued in 2014 **(5 Marks)**
- B. Using the closing prices provided in **Exhibit 1** of the Case Study, determine whether the convertible bond holders would have chosen to convert the bonds on August 06, 2018? Would your answer change if the decision was to be made on August 07, 2018? **(4 Marks)**
- C. Goldman Sachs, Morgan Stanley, JP Morgan, Deutsche Bank Securities acted as underwriters to the convertible bond issue. Assume the bond was underwritten on a firm commitment basis.
- Explain the role of an underwriter in capital markets and compare the benefits and drawbacks between best efforts underwriting and firm commitment underwriting **(5 Marks)**
 - Contrast how the implementation of firm commitment underwriting differs between Sri Lanka and the USA **(4 Marks)**
 - Calculate how much proceeds the underwriters would earn from the bond issue **(2 Marks)**

(Total 20 Marks)

Question 2

(Based on Exhibit 3 of the Case Study)

- A. Explain the **meaning** and **implications** to the bond holders of the features such as Guarantee, Callability and Seniority embedded in the 5.3% 2025 Bond issued by Tesla. (5 Marks)
- B. The Bond rating and Issuer rating assigned to the 5.3% 2025 Bond at the time of issue was 'B-'
- Discuss the difference between the Bond Credit Rating and Issuer Credit Rating. (3 Marks)
 - Identify the two credit rating agencies available in Sri Lanka and the other major credit rating agency in the USA that is not identified in the Case Study. (2 Marks)
 - Discuss the four major criteria in credit evaluation used by credit rating agencies (4 Marks)
 - For each of the embedded features identified in **part 'A'** above, **explain** whether the Bond credit rating should have been notched higher, lower or the same as the Issuer credit rating? (3 Marks)
- C. Assume that today is September 21, 2018. Based on expectation of interest rate movements you arrive at a reasonable expectation that the bond may be called on the second call date.
- Draw a **cash flow diagram** to depict the cashflows available to the bond holders of the Tesla 5.3% 2025 bond if the Bond is to be called on the second call date. (2 Marks)
 - Calculate the **capital** payout required by Tesla when the bond is called in this scenario (1 Mark)
- (Total 20 Marks)

Question 3

(Based on Exhibit 3 and Exhibit 5 – Paragraph C of the Case Study)

- A. The market price of the Bond provided in Paragraph C of Exhibit 5 is as at **August 27, 2018**.
- Explain the terms clean price, full price and accrued interest of a bond (3 Marks)
 - Calculate the accrued interest of the 5.3% 2025 Bond as at August 27, 2018. (2 Marks)
 - In Exhibit 5 (Para C), the author claims that the price of \$ 87.25 results in a certain yield to maturity. Utilizing the yield to maturity stated by the author, calculate the price of the Bond as at August 27, 2018. Is the claim by the author correct? **Why or Why not?** *Assume the bond is held to maturity and would not be called.* (8 Marks)

B. For the questions below, assume all data provided in Exhibit 5 (Para C) is as at **August 15, 2018**.

a. The author claims that bond holders have lost 12.75% over the year. Show, via calculations, how he arrived at this value and discuss short falls in his calculation methodology. **(3 Marks)**

b. If the coupons could be reinvested at 3.0% *p.a.* compounding semi-annually, calculate the actual holding period return to an investor who purchased the bond when it was first issued. **(4 Marks)**

(Total 20 Marks)

Question 4

A. What is the difference between broker markets and dealer markets? Identify examples of each type of market in Sri Lanka. Which category does the exchange Tesla is listed in belong to? **(4 Marks)**

B. "An efficient market is one in which no one ever profits from having better information than the rest." Is this statement true, false or uncertain? Explain your answer. **(4 Marks)**

C. (Based on Exhibit 1 and 4 of the Case Study) On August 07th, 9.48 a.m. Elon Musk tweeted that he plans to take the company private at \$ 420. *Assume markets are efficient.*

a. If all investors believed Musk, what price should the share close on August 07? **(1 Mark)**

b. If no investor in the market believed the statement and no other new information on Tesla was available, what price should the share price end at on August 07? **(1 Mark)**

c. Assume 50% of investors believed the statement made by Musk. What may be an appropriate closing price for the share on August 07, 2018? What does your answer imply about the actual closing price of the Tesla share on that day? **(2 Marks)**

D. (Based on Exhibit 1 of the Case Study) On August 01, 2018, Tesla released its quarterly financial results for the June quarter.

a. Evidence in favour of efficient markets suggests that anticipated announcements do not affect the stock price. Is this statement true, false or uncertain? Explain your rationale **(3 Marks)**

b. What is meant by the term 'Earnings Surprise' in relation to efficient markets? **(2 Marks)**

c. Calculate the earnings surprise for the Tesla stock and discuss what may have happened to the share price when the financial results were released to the public on 01-Aug-2018?. **(3 Marks)**

(Total 20 Marks)

Question 5

- A. What is the difference between a market order and a limit order? If an investor wanted to sell 1,000 shares of Tesla at current market prices which type of order would he need to execute? At what price would the order be executed? Utilize *bid and ask* data in **Exhibit 1**. (4 Marks)
- B. Discuss what is meant by short sales and explain Musk's statement in Exhibit 4 paragraph C that "there are large numbers of people who have the incentive to attack the company". (4 Marks)
- C. (Utilize closing prices given in **Exhibit 1** where required.) Assume two investors, X and Y, each took an opposite position in Tesla on August 06, 2018. X is bullish on the stock and decides to invest in 100,000 shares utilizing a margin trading facility provided by his broker. In contrast Y decides to short 200,000 shares. The initial margin requirement for both transactions is 60%.
- a. Using T diagrams show the initial position of Assets and Liabilities held with the broker for each investor as at August 06, 2018. (4 Marks)
- b. Calculate the margin of each investor on August 07, 2018. If the maintenance margin is 45% identify if either investor would receive a margin call (5 Marks)
- c. Calculate the non-annualized one day holding period return for each investor (3 Marks)

(Total 20 Marks)

Question 6

- A. Valuation of equity may be carried out using the Dividend discount approach, Free Cash flow valuation approach or Relative Valuation approach.
- a. Explain the underlying principles behind each of the three methods (4 Marks)
- b. Is it appropriate to state that the Dividend discount approach and Free Cash Flow based approach are not the most suitable methods to value Tesla shares? Justify your rationale. (3 Marks)
- c. Based on the relative valuation approach, use **any two ratios** provided in **Exhibit 1**, as *appropriate*, to arrive at two valuations to justify a range for the fundamental share price for Tesla. Based to your results, is the company overvalued or undervalued compared to market prices as at 07-Aug-2018? (3 Marks)

- B.** Are the following statements True, False or Uncertain? **Explain** your rationale. **(3 Marks)**
- With all else held constant, a firm will have a higher P/E if its beta is higher.
 - P/E will tend to be higher when ROE is higher (assuming plowback is positive).
- C.** ‘Greenlight Capital is among the hedge funds that have been short Tesla for several years. Almost every quarter, the Fund devotes a portion of its client letter to reiterate why it thinks the stock is vastly overvalued. In its recently published second-quarter letter, the Fund devoted three paragraphs to explain why Tesla is not how bullish investors present it. “*The odd thing is that investors claim to be interested in the long-term growth of TSLA (as the valuation certainly can’t be supported by the current loss-making enterprise),*” the letter stated.’ *(institutionalinvestor.com; August 07, 2018)*
- What is a hedge fund? Compare and contrast a hedge fund against a mutual fund. **(3 Marks)**
 - Calculate** the Present Value of Growth Opportunities (PVGO) investors have priced in to the stock as at August 06th. **What** is PVGO as a percentage of this Share price? *The current 10-year Treasury rate is 2.98%. Assume a market risk premium of 5.5% is appropriate.* **(4 Marks)**
- (Total 20 Marks)**

Question 7

(Based on Exhibit 4 of the Case Study)

- A.** On August 07, 2018, Elon Musk tweeted that he was considering taking Tesla private.
- Discuss the rationale of why sometimes companies prefer to ‘go private’ **(3 Marks)**
 - Taking a company private is a common practice in certain private equity transactions.
 - Identify and explain the two broad categories of private equity transaction types **(4 Marks)**
 - Discuss in detail, the lifecycle of a private equity fund pertaining to the category of taking a company private **(4 Marks)**
- B.** In his earnings call conference to investors, Musk was dismissive on a question posed by an analyst.
- Explain the concept of Adverse Selection and Moral Hazard. How might comments such as those made by Musk promote either of these situations? **(4 Marks)**
 - Conflicts result in higher financial market regulation. Identify three reasons for financial market regulation and discuss in detail the rationale for the one relating to the above conflict. **(5 Marks)**
- (Total 20 Marks)**

Question 8

(Based on Exhibit 1 and Exhibit 6 of the Case Study)

A. Tesla is classified under the Consumer Discretionary Sector under the GICS classification. Briefly discuss the GICS classification system and explain the rationale behind Sri Lanka introducing GICS to the Colombo Stock Exchange recently. (4 Marks)

B. The following conversation ensues between two investors:

X: *I was thinking about buying Tesla yesterday (Aug 06). I wish I had done so; I could have sold the share for a profit today. Maybe I can still get some exposure through a mutual fund.*

Y: *I don't think any mutual fund has meaningful exposure to Tesla at the moment. But you could do the same thing by buying an ETF. I believe ARKQ has over 10% currently invested in Tesla.*

X: *But investing in an ETF is the same as buying the share directly because the ETF price changes with market prices; the difference is that I become owner of a whole portfolio when I buy the ETF. But in a mutual fund, I will be able to buy the Fund at yesterday's price if I act right now.*

- a. Explain the difference between a mutual fund and an Exchange Traded Fund (4 Marks)
 - b. Is investor X correct in his statement regarding buying an ETF? Why or why not? (3 Marks)
 - c. Why is X's statement regarding buying a mutual fund incorrect? Explain the conflict *pertaining to mutual funds* that X alludes to and steps that have been taken to remedy the conflict. (4 Marks)
- C. Calculate the NAV of ARKQ Fund on **August 07, 2018**. Assume the following: (5 Marks)
- i. ARKQ's **asset value** (before expenses) is \$ 176.85 mn on August 06 with 4.8765 million shares.
 - ii. \$ 20 million Face Value is invested in a commercial paper yielding 4.25% with 152 days to maturity as at **August 06, 2018**. This is the only fixed income exposure within the fund.
 - iii. The **other equity holdings** in the Fund (*excluding Tesla and the CP*) has a beta of 2.5 to the NASDAQ index and performed accordingly, compared to the performance of the NASDAQ index, on August 07, 2018. (*Hint: beta indicates the percentage change in a security's return to a 1% change in the market*)
 - iv. The **annualized expense ratio** is 0.75% p.a.

(Total 20 Marks)

Question 9

(Based on Exhibit 7 of the Case Study)

- A. Explain the concept of tranching in a securitization. (3 Marks)
- B. Explain how Tesla has managed to create five distinct instruments of varying credit ratings by issuing an Asset Backed security using an unrated subsidiary. *Your discussion should include a description of the process, the underlying mechanics and structure of the instruments created, the credit enhancements provided and how they would impact the rating and yield.* (5 Marks)
- C. Explain the meaning of oversubscribed. Why might the level of oversubscription have impacted the ultimate yield of the issue? (3 Marks)
- D. Assume that the Trust was expected to receive a cash flow of \$ 25 mn in August to be distributed among investors in proportion to the percentage of assets in each tranche. If only \$ 22 mn was actually received, what is the cash flow that investors in each tranche are entitled to? (3 Marks)
- E. Assume that the securitization has been structured as fixed income instruments carrying semi-annual coupons. The coupon is payable semi annually and is equal to the yield at the time of issue. Calculate the duration of the Tranche B security when it was issued in February 2018. (4 Marks)
- F. In its rating report, Moody's further highlighted the following concerns regarding the Issue: "47% of leases are concentrated in California compared to recent auto ABS issuances by BMW and Mercedes which reflected concentrations of 15% and 28% to California respectively. Similarly, the pool comprises of Tesla Model S (69%) and Model X (31%) compared to model concentrations of 19% (3 Series) and 21% (C Class) for BMW and Mercedes Benz respectively" Why should potential investors be concerned about the above statement? (2 Marks)

(Total 20 Marks)

FORMULA SHEET

$$FV = PV \cdot (1 + i)^n$$

Present value and Future Value of an Annuity: $PV = \frac{C}{i} \cdot \left[1 - \frac{1}{(1+i)^n}\right]$ $FV(A) = A \cdot \frac{(1+i)^n - 1}{i}$

Bond Price: $P = [C \{ 1 - (1+r)^{-n} \} / r] + [FV / (1+r)^n]$

Duration = $D = \sum [w_i \times t_i]$

where $w_i = [CF_i / (1+r)^i] / \text{Price}$

Modified Duration = $D^* = D / (1+r)$

Price Duration Relationship (as appropriate): $\frac{\Delta P}{P} = -D^* \times \Delta r$ $\frac{\Delta P}{P} = -D^* \times \Delta r + \frac{1}{2} \times \text{Convexity} \times (\Delta r)^2$

Capital Asset Pricing Model: $E(r_i) = r_f + \beta_i [E(r_m) - r_f]$

Expected rate of return on a security with probability of occurrence of p_i : $E(r) = \sum [p_i \times E(r_i)]$

Expected Price (P) of a security with probability of occurrence of p_i : $E(P) = \sum [p_i \times E(P_i)]$

Geometric Average Return: $r_G = [(1+r_1)(1+r_2)\dots\dots(1+r_n)]^{(1/n)} - 1$

Price of a discounted security: $P = FV / [1 + (r \times d_1 / d_2)]$ where $d_2 = 360, 364, 365, 366$ etc.

No Growth Dividend Discount Model: $V_n = D_{n+1} / k$

Constant Growth Dividend Discount Model: $V_n = D_{n+1} / (k-g)$ where $D_{n+1} = D_n(1+g)$

Growth Rate of Dividends: $g = ROE \times b$

Present Value of Growth Opportunities: $PVGO = V_0 - [E_1 / k]$

Justified Price Earnings multiple: $P/E = (1-b) / [k - (ROE \times b)]$ or $P/E = (1/k) [1 + \{PVGO / (E_1/k)\}]$

Definition of EBITDA: Earnings before Interest, Tax, Depreciation and Amortization

Free Cash Flows to Firm: $FCFF = EBIT(1-Tax) + \text{Depreciation} - \text{CapEx} - \text{Increases in NWC}$

Free Cash Flows to Equity: $FCFE = FCFF - \text{Interest Expense (1-Tax)} + \text{Increases in Net Debt}$

Value of Firm Equity = $PV \text{ of } FCFF - \text{Existing Market Value of Debt}$