Philip Rodrigues Case Scenario

Philip Rodrigues is an analyst at Value Tigers. He is specialist in automobile sector. His fund manager has asked him to value few companies. He has to do absolute valuation rather than relative valuation. He is valuing Amazing Motors. The data about the company is given in Exhibit 1.

Exhibit 1

Dividend paid last year	$2.5 million
Common shares outstanding	500,000
Beta of the stock	1.2
Annual risk free rate	4.0%
Market risk premium	8.0%
Earnings of the last year	$5.0 million
Marginal tax rate	40%
Profit margin	8.0%
Asset turnover ratio	1.2
Financial leverage	1.5

The company has a long history of dividend payments. So, he decides to use dividend discount model to value the company. The company is a mature one and is expected to grow at a sustainable growth rate.

The value calculated by him comes out to be greater than the current market price of the stock. He shows his valuation results to his fund manager, Stephan Kinsella. Stephan finds the stock attractive and asks Philip to do scenario analysis on the stock. Philip asks him what all inputs he should change for the scenario analysis.

Stephan: As you have used Gordon growth model, it is most sensitive to the growth rate and the required return on equity. The higher is the spread between those, the lower is the value of the company. As the spread becomes narrow, the value of the stock rises sharply.

Philip: Okay. What other factors should I consider?

Stephan: Since you are using GGM (Gordon Growth Model), the only inputs to that model are current dividend, sustainable growth rate and the required return on equity. You can also use normalized earnings in your model to come out with the correct estimate of the dividends. One more thing you can look for is the present value of growth opportunities. The value of the company without growth opportunities will give us a base case for our analysis.

After doing scenario analysis, Philip allocates probability to the scenarios. He gives 20% probability to each worst case and best case scenario and 60% probability with the normal case scenario. The stock value after probability allocation comes out to be lower than the earlier calculations. However, the stock is still undervalued as compared to the market price.

Stephan asks Philip to calculate the implied rate of return provided by the market price so that they can look at the spread (margin of error) they can expect to earn by investing in that stock. The current stock price is $65.5.

Philip calculates the spread. He also asks whether they are taking a majority stake in the firm or the minority stake and would that impact the valuation of the company.

Stephan: We are taking a minority stake. But there won't be any impact in the value of the stock. In case of majority stake, we can change the disbursement of dividends policy and free cash flow is a better approach for valuation.

1. What is the sustainable growth rate for Amazing Motors?
   a) 5.14%
   b) 7.20%
   c) 12.00%

2. What is the value of company per share using Gordon Growth model?
   a) $78.12
   b) $83.75
   c) $335.00

3. What is the present value of the growth opportunities per share?
   a) $10.22
   b) $46.99
   c) $221.36

4. Is Stephan accurate about the difference between the valuation of majority and minority stake?
   a) Yes, because the value of stock will remain the same as there won't be any impact on earnings on changing the stake
   b) Yes, because the free cash flow approach and dividend discount model always give the same value
   c) No, the value of majority stake is typically higher than the minority stake

5. What is the justified trailing P/E ratio of the company?
   a) 8.37
   b) 7.81
   c) 6.55

6. How much spread they can expect to earn by investing in the company?
   a) 1.23%
   b) 1.44%
   c) 1.78%

Robert Treacy Case Scenario

Robert Treacy is a high net worth individual. He is looking at the investment opportunity in a company Thermax Limited. He wants to acquire a majority stake in the company.

Thermax Limited is a small capitalization company operating in the energy sector. The income statement and balance sheet for the company for the recent year is given in Exhibit 1.

Exhibit 1
Income Statement (All figures are in millions of dollars)

	2013 Forecast	2012 Actual
Sales	400	350
COGS	220	200
SG&A	40	40
EBITDA	**140**	**110**
Depreciation	40	40
Amortization	15	15
EBIT	**95**	**65**
Interest expense	27	25
Pre-tax earnings	**68**	**40**
Taxes (at 40%)	27.2	16
Net Income	**40.8**	**24**

Balance Sheet

	2013 Forecast	2012 Actual
Cash	140	40
Accounts receivable	65	55
Inventory	80	75
Current Assets	**285**	**170**
Net PP&E	675	655
Patents	80	95
Total assets	**1,040**	**920**
Accounts payable	30	30
Notes payable	60	45
Current liabilities	**90**	**75**
Long-term debt	285	250
Shareholders' equity	550	500
Retained earnings	115	95
Total liabilities and owners' equity	**1,040**	**920**

Thermax Limited financial statements are according to U.S. GAAP. The company has not sold any asset during these two years. The financing data about the company has been provided in Exhibit 2.

Exhibit 2

Target D/E ratio	0.50
Marginal before-tax cost of debt	8.0%
Marginal cost of equity	12.0%
Marginal tax rate	40.0%

The free cash flow to the equity is expected to grow at a constant rate of 6% from 2013 onwards. The market value of debt is 110% of total book value of debt in 2012.

Robert Treacy is also valuing another company using free cash flow approach. He finds out that the company has issued debt at a discount to the par and is put up on the balance sheet at amortized cost. The amortized discount has been subtracted and the coupon payments have been added to the income statement. He is concerned about the treatment of these cash flows from the debt and their impact on the free cash flow to the firm.

The same company also has the deferred tax assets on its balance sheet. But those assets are expected to reverse in near future.

7. What is the free cash flow to the firm for Thermax Limited in 2013?
   a) $22.0 milllion
   b) $37.0 million
   c) $77.0 million

8. What is the free cash flow to equity for Thermax Limited in 2013?
   a) $32.0 million
   b) $55.8 million
   c) $70.8 million

9. What is the total net payment by the company to the equity holders in 2012?
   a) -29.2 million
   b) -44.2 million
   c) -$68.0 million

10. What is the treatment of deferred tax assets on the free cash flow for the given company?
    a) It should be subtracted from the net income to get FCFF
    b) It should be added back to the net income to get FCFF
    c) It should be ignored

11. What is the impact of the debt's cash flows on the FCFF which is bought at a discount?
    a) The amortized discount should be added back and the coupon payments should be subtracted from the net income to get FCFF
    b) The amortized discount should be subtracted from the net income to get FCFF and the coupon payments should be ignored
    c) The amortized discount should be added back to the net income to get FCFF and the coupon payments should be ignored

12. What is the market value of the firm for Thermax Limited in 2012?
    a) $1,475.0 million
    b) $1,504.5 million
    c) $1,650.6 million

Ravi Kumar Adukia Case Scenario

Ravi Kumar Adukia is a fund manager for Adukia Investments. His fund was performing well before 2008 but after crisis hit in 2008, the fund has been not performing well. He analyzed the stocks and found out that they failed to take into account the sensitivity analysis in the valuations done by them. Because of that there were huge valuation errors in the valuations. The valuation got butchered by the rise in required rate of return and the fall in growth. Almost all of their valuations were based on the terminal value. The terminal value was very sensitive to the growth rate and the required rate of return.

He calls his best analyst, Rahul Daga, to discuss about this situation. He wants to change the models so that the effect of the sensitivity to the terminal value could be removed. Rahul Daga suggests the usage of residual income valuation model and states that in the residual income model, most of the value comes from the current book value and the terminal value is quite small.

He asks Rahul to change the models to residual income valuation models and to calculate the value of the stocks of the portfolio using that model. Rahul starts the valuation of a company using residual income valuation model. The data for the company has been provided in Exhibit 1.

Exhibit 1

Beginning book value of equity for 2012-13	$400 million
Ending book value of equity for 2012-13	$450 million
Required return on equity	12.0%
Persistence factor for residual earnings after 2013-14 (ω)	0.8
Earnings for 2012-13	$72 million
Outstanding common shares	1.2 million

The return of equity is expected to remain exactly the same in year 2013-14 as that of year 2012-13.

Ravi Kumar asks Rahul about the persistence factor and how does it impact the value of the stock in the relative valuation model.

Rahul: The ROE is not expected to remain forever higher than required return on equity. Eventually, it will come down and becomes equal in the long-run. When it becomes equal to the required return on equity, the residual income falls to zero. The persistence factor catches that fall. The higher is the persistence factor, the more is the economic profit earned by the firm because of the residual earnings.

Ravi Kumar: What are the major factors that impact the persistence factor?

Rahul: There are many factors like dividend payout ratio, persistence of residual income in the industry, the magnitude of ROE, and the accounting accruals.

Ravi Kumar: This model seems to be the perfect model for equity valuation. Are there any weaknesses of this model? Can it be used for every company?

Rahul: It is generally used to value banking sector stocks. However, it can be used for any company. The main limitations with regard to this model are the unreliability of accounting data and the violation of clean surplus equation.

Ravi Kumar: What are the driving factors of the stock price according to this model?

Rahul: The lower is the spread between ROE and required return on equity, the higher is the value of the equity.

Ravi Kumar: The formula of this model looks like that of justified P/B ratio. The justified P/B ratio is equal to

(ROE – g)/(r-g) and the value of stock using this formula is (ROE-r)*B_0/(r-g). The value of stock can also be written as (ROE-g)*B_0/(r-g) – (r-g)*B_0/(r-g) or (Justified (P/B) ratio – 1)*B_0.

Rahul: Exactly. The higher is the value of justified P/B ratio, the higher is the value of the stock.

13. What is the value per share for the company?
    a) $437.50
    b) $445.31
    c) $475.00

14. What is the present value of the company's expected economic profit?
    a) $75.00 million
    b) $84.37 million
    c) $112.25 million

15. What is the value of the company if the residual income persists forever?
    a) $600 million
    b) $650 million
    c) $675 million

16. If the company has paid a dividend of $5 per share and its beginning book value per share was $25 per share and the earnings per share for the year were $7, what is the least likely value of the ending book value per share if there is a violation of clean surplus relation?
    a) $23.00
    b) $25.00
    c) $27.00

17. Which of the following statements made by Rahul is least accurate?
    a) About limitations of the residual income valuation model
    b) About the driving factors of the price of the stock
    c) About the persistence factor of the residual income

18. Which of the following factors is least likely to be associated with lower persistence factor?
    a) High dividend payout ratios
    b) Low magnitude of ROE
    c) High accounting accruals

Rohan Pinto Case Scenario

Rohan Pinto is an equity research analyst working in Gamma Hedge Company. He gives calls to the traders based on the relative valuation models. He is calculating the different justified price multiples from the data given in Exhibit 1 and comparing those with the actual multiples.

Exhibit 1
Data for AXL Software

Profit margin	10.00%
Earnings	$120 million
Dividends paid	$80 million
Book value of equity at the beginning of the year	$600 million
Risk free rate	6.00%
Market risk premium	10.00%
Beta of the stock	0.8
Common outstanding shares	60 million

The stock of the company is trading at $20 per share. The average multiples of the industry are given in Exhibit 2.

Exhibit 2
Industry Data

P/E multiple	7.56
P/B multiple	1.52
P/S multiple	0.86
Average required return on equity	13.5%
Average growth rate in industry	8.0%

Rohan Pinto is concerned about the relevance of the price multiple. He discusses the various factors which can lead to the difference in price multiples across firms with Roshan Pinto. Roshan Pinto is his colleague and also a CFA level II candidate.

Rohan: AXL software has higher price multiples than the industry average. Can we say that it is overpriced?

Roshan: Higher or lower price multiples do not necessarily mean that the stock is overvalued or undervalued. The multiples can be high/low because of the higher/lower expected growth rate and lower/higher required rate of return.

Rohan: Is there any multiple which can get rid of the above problems mentioned by you?

Roshan: There is a multiple PEG which divides the P/E by the growth rate to take care of the growth.

Rohan: I have complied the price multiple ratio of various companies. How should I calculate the industry average price multiple?

Roshan: You can either use median or the arithmetic mean. Those two methods are most suitable. But you must remove the outliers first as they can impact the averages.

Rohan: How are various price multiples related to growth rate?

Roshan: All price multiples are positively related to the growth rate except one.

19. What is the justified P/S multiple for AXL software?
  a) 0.909
  b) 0.969
  c) 1.045

20. What is the justified P/B ratio of AXL software?
  a) 1.82
  b) 3.26
  c) 5.26

21. The P/E ratio of AXL software stock is higher than that of industry average. Use exhibit 2 to tell the most likely reason for the difference in the P/E ratio?
  a) The stock is overvalued with respect to the industry
  b) The difference in P/E is due to the higher growth rate of AXL software than the industry average growth rate
  c) The difference in P/E is due to the lower required rate of return demanded on AXL software than the industry average required rate of return

22. Which of the following statements is least accurate about the PEG ratio?
  a) Keeping all other things constant, the higher is the PEG ratio, the overvalued the stock is relative to the benchmark
  b) The PEG ratio implies that the impact of growth rate is non-linear on the stock price while in fact the impact of growth rate is linear on the stock price
  c) The PEG ratio doesn't differentiate the stocks according to the riskiness of the business. A less risky stock can have a higher PEG ratio than a more risky stock and both can be properly valued

23. Which of the price multiple is negatively related to the growth rate?
  a) Price to book value ratio
  b) Price to cash flow ratio
  c) Dividend yield ratio

24. Which of the following statements made by Roshan is least accurate?
  a) Regarding the reasons behind the difference between the price multiples
  b) Regarding the calculation of average industry multiples
  c) Regarding the calculation of PEG ratio

Ashish Joshi Case Scenario

Ashish Joshi is an equity analyst with DaulatGuru. His area of expertise is to value thinly traded companies. Brooklyn Inc. is also a thinly traded company. The company operates into energy distribution space. Mintax Limited is another company which also operates in the same sector. The details for Mintax Limited have been given in Exhibit 1.

Exhibit 1
Mintax Limited

Required rate of return on equity	12%
D/E ratio	0.667
Risk-free rate	6.0%
Rate of return from the market	10%
Marginal tax rate	40%
Marginal before-tax cost of debt	10%

Ashish uses Mintax Limited as benchmark for Brooklyn Inc. and calculates the beta of Brooklyn Inc. The details for Brooklyn Inc. have been provided in Exhibit 2.

Exhibit 2
Brooklyn Inc.

D/E ratio	0.8
Marginal tax rate	35%
Marginal before tax cost of debt	10.5%

Ashish calculates the value of Brooklyn Inc. using that beta and finds out that the company is undervalued. He invests in the stock at $12.5 per share.

Jachim Gobien is another analyst with DaultGuru. He has some doubts related valuation. He discusses those doubts with Ashish Joshi.

Jachim: I have been valuing conglomerate companies. I have observed that the overall value of company is less than the sum of the parts of the company. What is the reason behind that? As per my finance theory, the company value should be higher because of the low cost of financing and economies of scale.

Ashish: The conglomerate businesses generally trade at a discount. That is because of the ineffective capital budgeting. The company might also have pursued into unrelated businesses to hide the poor operating performance.

Jachim: I have used Fama French model to value the cost of equity for Yemex Inc. which is coming as 7.8%. But my fund manager is asking me to adjust the cost of equity for liquidity factor as well. The liquidity risk premium is 2.5% and the company's factor beta towards liquidity is -0.3. Which model should I use to calculate the cost of equity?

Ashish: You should use Pastor-Stanbaugh model. That model accounts for the liquidity factor as well. The base value for the liquidity factor is one. But while calculating do check the other factor beta as well. They might get changed because of addition of one more variable in the regression equation.

Jachim: That thing I have already checked. There have been no changes in the factor betas for other variables. I was also studying an equity research report about a company which is liquidating. There were two different values for the company assuming normal liquidation and orderly liquidation. What is the difference between those two values?

Ashish: The orderly liquidation assumes that the company will be liquidated but in the ordered fashion and the value of the company using orderly liquidation is more than without orderly liquidation.

Jachim notices the Bloomberg screen on the system of Ashish. He notices that there has been sharp unexpected steepening of the Treasury yield curve in last few days. He has used one macroeconomic multifactor model to calculate the cost of equity of a stock. He takes leave from the company of Ashish to adjust the changes due to the steepening of curve in his macroeconomic multifactor model.

25. What is the asset beta for Mintax Limited?
    a) 0.90
    b) 1.07
    c) 1.50

26. What is the cost of equity for Brooklyn Inc.?
    a) 11.47%
    b) 12.48%
    c) 13.12%

27. What is the holding period return for Ashish if he sells the stock for $18 per share after 2 years?
    a) 20.00%
    b) 22.00%
    c) 44.00%

28. Which of the following statements made by Ashish Joshi is least accurate?
    a) Regarding conglomerate discount
    b) Regarding liquidation of a firm
    c) Regarding Pastor-Stanbaugh model

29. What is the cost of equity for Yemex Inc. using Pastor-Stanbaugh model?
    a) 7.05%
    b) 8.55%
    c) 10.3%

30. Which of the following risk factors is most likely to be affected by the steepening of the Treasury yield curve?
    a) Confidence risk
    b) Time horizon risk
    c) Inflation risk