

Use the following information to answer Questions 25 through 30.

Jared Rojas, CFA, is an analyst at Van Westmoreland Investments, an international equities investment firm. Rojas has been assigned to value three U.S. companies in the paper products industry. The long-term growth rate for this industry is expected to be 3.4%.

Basil Montreux Company (BMC) is the largest company in the paper products industry. BMC is considered to be a stable and mature company. The equity beta of BMC based on a single factor capital asset pricing model is 0.90.

Exhibit 1 shows selected information from BMC's financial statements for the fiscal year ending 20X2.

Exhibit 1: Selected Financial Information for BMC

<i>Income Statement</i>	<i>20X2</i>
Revenue	\$20,000.0 million
EBITDA	\$3,750.0 million
Operating income	\$3,290.0 million
Interest expense	\$600.0 million
Income tax rate	30.0%
Payout ratio	72.0%
Total assets	\$31,997.0 million

Exhibit 2: Additional Information

Risk-free rate	4.0%
Market risk premium	5.0%
Size premium	2.0%
Value premium	4.0%
Liquidity premium	4.5%

Marcel Schultz Company (MSC) is another company in the paper products industry; MSC focuses on the specialty products niche. MSC is expected to enjoy a growth rate of 25% over the next three years, after which the growth rate is expected to match the overall industry growth rate. Last year's reported dividend was \$278.0 million and reported earnings were \$505.4 million.

MSC's market model regression beta is 1.12. Due to beta drift, this beta needs to be adjusted.

Sunil Gurpreet Company (SGC) is a small company focusing on new high-density paper, which has found application in the aerospace industry. SGC's earnings and revenues are expected to grow at 30% for eight years, after which time the technology will lose patent protection and SGC's growth rate will revert to the industry's overall growth rate. Last year's reported earnings were \$160 million but these earnings are believed to be of poor quality. SGC has never paid dividends. SGC's earnings can be volatile, but cash flows have been positive and stable. Rojas obtains inputs to estimate SGC's cost of equity as shown in Exhibit 3.

Exhibit 3: SGC's Cost of Equity Factor Exposures

<i>SGC</i>	β <i>Market</i>	β <i>Size</i>	β <i>Value</i>	β <i>Liquidity</i>
Factor sensitivities	1.20	0.50	-0.20	0.20

Rojas additionally gathers the following market data regarding the three companies:

Exhibit 4: Current Market Price and Shares Outstanding

<i>Company</i>	<i>Market Price</i>	<i>Shares outstanding (millions)</i>
BMC	\$26.50	1,000
MSC	\$34.25	250
SGC	\$28.45	100

25. Using an appropriate valuation model, the estimated value per share of BMC is *closest* to:
 - A. \$16.50.
 - B. \$26.50.
 - C. \$27.60.

26. Using an appropriate valuation model, the estimated value per share of MSC is *closest* to:
 - A. \$ 33.00.
 - B. \$ 33.80.
 - C. \$ 34.50.

27. The *most appropriate* model to use in estimating the value of SGC is the:
- A. residual income model.
 - B. dividend discount model.
 - C. free cash flow model.
28. The fraction of SGC's market price that is attributable to the value of growth is *closest* to:
- A. 21%.
 - B. 34%.
 - C. 50%.
29. If the justified leading P/E for BMC stock is 14.1X, then BMC stock is *best* described as:
- A. overvalued.
 - B. undervalued.
 - C. fairly valued.
30. For this question only, assume that SGC's cost of equity is 12% and that the firm pays a regular dividend, most recently \$0.80. If the initial growth rate is expected to decrease linearly over the coming eight years to the long-term industry growth rate, the estimated value of SGC stock is *closest* to:
- A. \$20.
 - B. \$26.
 - C. \$30.

21. C $\Delta P = D(1 - T_D) / (1 - T_{CG}) = 2.25(1 - 0.15) / (1 - 0.396) = 3.17$
(Study Session 7, LOS 23.c)
22. C Investors do not like instability in the dividends paid by a company. Any volatility in dividends is seen as a negative sign by investors, and the company's stock price would be punished as a result of varying dividends. According to the bird-in-the-hand theory, investors prefer the assurance of receiving a higher dividend today rather than waiting for returns in the form of capital appreciation. Because of the uncertainty associated with capital appreciation and the relative certainty of dividends, the bird-in-the-hand theory predicts that investors will reward dividend paying companies with a lower cost of equity and, thus, a higher equity value. A repurchase does not provide the same type of assurance since it is an unpredictable and possibly one-time event. (Study Session 7, LOS 23.a,b,f)
23. A If the company plans on spending \$160 million on net investments, then only 60% of the funds need to come from retained earnings. Therefore, MavsHD needs $0.6 \times 160 = \$96$ million in retained earnings. Net income is projected to be \$153 million, leaving \$57 million ($153 - 96$) available to pay dividends. Thus, the dividend payout ratio would equal $57 / 153 = 37.3\%$. (Study Session 7, LOS 23.f)
24. B Under a residual dividend policy, a firm determines the optimal capital budget and then uses retained earnings to fund the optimal capital budget, paying out what is left over to shareholders. Because the amount of distributable earnings is not known in advance and is determined as a function of the capital budget, the dollar dividend paid to shareholders will fluctuate widely from year to year. However, the firm will be able to use internally generated funds to a greater extent when deciding how to fund the optimal capital budget. It is not true, however, that the residual dividend policy will reduce the firm's cost of capital. Investors do not like unpredictable dividends and will penalize the company in the form of a higher required return on equity to compensate for the additional uncertainty related to dividend payments. (Study Session 7, LOS 23.f)
25. C BMC is a mature company. The most appropriate model for valuation is the single-stage Gordon growth model.

	<i>In \$ millions</i>
EBIT (operating income)	3,290.0
Interest expense	600.0
Earnings before tax	2,690.0
Tax at 30%	807.0
Earnings	1,883.0
Dividends at 72%	1,355.8
Dividend per share	1.36

<i>Cost of Equity:</i>	
CAPM beta	0.90
Risk-free rate	4.0%
Market risk premium	5.0%
Discount rate	$(0.90)(5.0\%) + 4.0\% = 8.5\%$

LT growth rate = 3.4% (given)

$$\frac{1.36 \times (1.034)}{(0.085 - 0.034)} = \$27.57$$

(Study Session 9, LOS 28.c; and Study Session 10, LOS 30.c)

26. A MSC is best valued using a two-stage growth model. For the first three years, dividends grow at 25.0%; after Year 3, dividends grow at 3.4%. Calculate the Year 4 dividend and use this to find the terminal value, which is treated as additional cash flow in Year 3.

<i>Value of Dividend</i>	<i>In \$ millions</i>
Year 0	278.0
Year 1	347.50
Year 2	434.38
Year 3	542.97
Terminal value (Year 3 cash flow)	$(542.97 \times 1.034) / (0.094 - 0.034)$ = 9357.18

<i>Cost of Equity:</i>	
CAPM beta	1.12
Adjusted beta	$1.12(2/3) + 1.00(1/3) = 1.08$
Market risk premium	5.0%
Discount rate	$(1.08)(5.0\%) + 4.0\% = 9.4\%$

Using a financial calculator, CF0 = 0; CF1 = 347.50; CF2 = 434.38; CF3 = 542.97 + 9357.18 = 9,900.15; I/Y = 9.4; solve for NPV = \$8,241.77 million.

Divide \$8,241.77 million by 250 million shares results in \$32.97 per share.

(Study Session 9, LOS 28.d; and Study Session 10, LOS 30.l)

27. C SGC is a growing company that has no dividend history, so the dividend discount model would be inappropriate. Residual income is appropriate for companies with high quality earnings. The value of SGC stock is best estimated using free cash flow model, as we are told that earnings are erratic but cash flows are stable. (Study Session 10, LOS 30.a)

28. B Using the Pastor-Stambaugh model to calculate SGC's cost of equity:

$$0.04 + (1.20 \times 0.05) + (0.50 \times 0.02) + (-0.20 \times 0.04) + (0.20 \times 0.045) = 11.10\%$$

$$\$28.45 = \frac{\$1.60(1.30)}{0.111} + \text{PVGO}$$

$$\$28.45 = \$18.74 + \text{PVGO}$$

$$\text{PVGO} = \$9.71$$

$$\begin{aligned} \text{PVGO/Price} &= \$9.71 / \$28.45 \\ &= 34.13\% \end{aligned}$$

(Study Session 9, LOS 28.c; and Study Session 10, LOS 30.e)

29. B If the justified fundamental leading P/E ratio is 14.1X, then the justified fundamental trailing P/E ratio is $(14.1) \times (1.034) = 14.6X$.

	<i>In \$ millions</i>
EBIT (operating income)	3,290.0
Interest expense	600.0
Earnings before tax	2,690.0
Tax at 30%	807.0
Earnings	1,883.0
Shares outstanding	1000.0
EPS	\$1.883

Based on the current market price, the trailing price-to-earnings is $\$26.50 / \$1.883 = 14.1X$. This means that the fundamental value is greater than the market price; the stock is undervalued. (Study Session 10, LOS 30.f)

30. A Using the H-model, valuation of SGC is:

$$\begin{aligned} V_0 &= \frac{D_0 \times (1 + g_L)}{r - g_L} + \frac{D_0 \times H \times (g_S - g_L)}{r - g_L} \\ &= \frac{\$0.80 \times (1.034)}{0.12 - 0.034} + \frac{\$0.80 \times 8 / 2 \times (0.30 - 0.034)}{0.12 - 0.034} \\ &= \$19.55 \end{aligned}$$

(Study Session 10, LOS 30.p)

31. B Normalizing EPS using the method of average EPS is accomplished by averaging the EPS over the six-year period from 2010–2015:

$EPS(\text{normalized}) = (1.90 + 1.65 + 0.99 + 1.35 + 0.77 + 1.04) / 6 = 1.283$. The P/E ratio based on this normalized EPS is $26.5 / 1.283 = 20.649$. (Study Session 11, LOS 32.e)

32. A Normalizing EPS (for 2016) using the method of average return on equity is accomplished by (1) averaging the ROE over the six-year period from 2010–2015, and then (2) multiplying the average ROE times the 2015 BVPS. $ROE(\text{average}) = (0.178 + 0.178 + 0.122 + 0.177 + 0.114 + 0.160) / 6 = 0.155$. $EPS(\text{normalized}) = 0.155(10.66) = 1.652$. The P/E ratio based on this normalized EPS is $26.5 / 1.652 = 16.04$. (Study Session 11, LOS 32.e)

33. A Book values are more likely to be positive than EPS. Thus, the P/B ratio suffers less often from the problem where P/E ratios are not meaningful because of a negative EPS. The other two advantages given are actually disadvantages associated with using P/B ratios. (Study Session 11, LOS 32.c,d)

34. A Aims is correct about both ratios. For example, let's take the trailing P/E ratio, which is P_0/E_0 . Multiplying by the net profit margin results in $P_0/E_0 \times E_0/S_0 = P_0/S_0$. If the justified P/E is $(1 - b)(1 + g) / (r - g)$, the justified P/S is $(E_0/S_0) (1 - b)(1 + g) / (r - g)$. Multiplying the leading P/E ratio by the ROE results in $P_0/E_1 \times E_1/B_0 = P_0/B_0$. If the justified P/E is $(1 - b) / (r - g)$, the justified P/B is $ROE(1 - b) / (r - g)$. This becomes $(ROE - b \times ROE) / (r - g)$. Since $b \times ROE = g$ (from sustainable growth equation), the equation becomes $(ROE - g) / (r - g)$. (Study Session 11, LOS 32.h)