

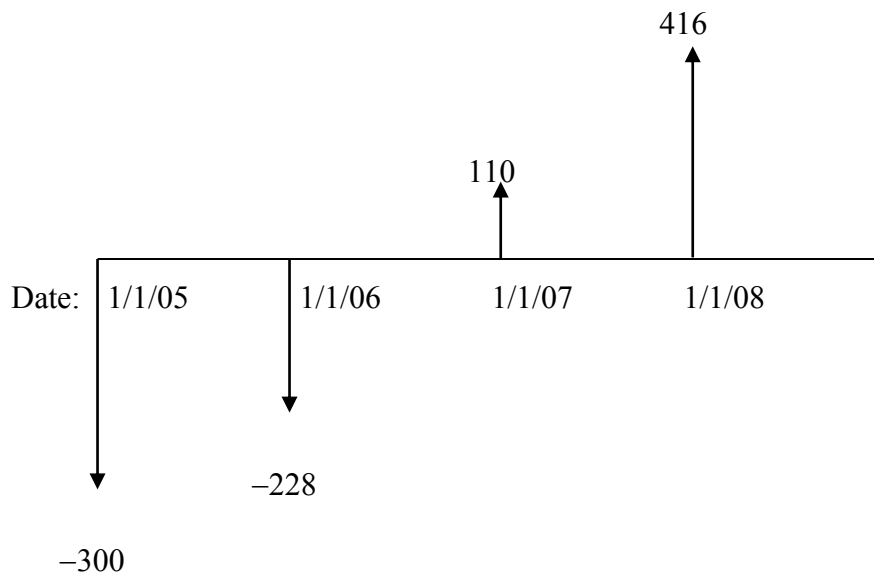
**Solutions**

5. a. Time-weighted average returns are based on year-by-year rates of return:

Year	Return = (capital gains + dividend)/price
2005 – 2006	$[(\$120 - \$100) + \$4]/\$100 = 24.00\%$
2006 – 2007	$[(\$90 - \$120) + \$4]/\$120 = -21.67\%$
2007 – 2008	$[(\$100 - \$90) + \$4]/\$90 = 15.56\%$
Arithmetic mean: $(24\% - 21.67\% + 15.56\%)/3 = 5.96\%$	
Geometric mean: $(1.24 \times 0.7833 \times 1.1556)^{1/3} - 1 = 0.0392 = 3.92\%$	

b.

Date	Cash Flow	Explanation
1/1/05	-\$300	Purchase of three shares at \$100 each
1/1/06	-\$228	Purchase of two shares at \$120 less dividend income on three shares held
1/1/07	\$110	Dividends on five shares plus sale of one share at \$90
1/1/08	\$416	Dividends on four shares plus sale of four shares at \$100 each



Dollar-weighted return = Internal rate of return = -0.1607%

8.

	Stock A	Stock B
(i) Alpha = regression intercept	1.0%	2.0%
(ii) Information ratio = $\alpha_P / \sigma(e_P)$	0.0971	0.1047
(iii) *Sharpe measure = $(r_P - r_f) / \sigma_P$	0.4907	0.3373
(iv) **Treyner measure = $(r_P - r_f) / \beta_P$	8.833	10.500

\* To compute the Sharpe measure, note that for each stock,  $(r_p - r_f)$  can be computed from the right-hand side of the regression equation, using the assumed parameters  $r_M = 14\%$  and  $r_f = 6\%$ . The standard deviation of each stock's returns is given in the problem.

\*\* The beta to use for the Treynor measure is the slope coefficient of the regression equation presented in the problem.

- b. (i) If this is the only risky asset held by the investor, then Sharpe's measure is the appropriate measure. Since the Sharpe measure is higher for Stock A, then A is the best choice.
- (ii) If the stock is mixed with the market index fund, then the contribution to the overall Sharpe measure is determined by the appraisal ratio; therefore, Stock B is preferred.
- (iii) If the stock is one of many stocks, then Treynor's measure is the appropriate measure, and Stock B is preferred.

11. a. Manager return:  $(0.30 \times 20) + (0.10 \times 15) + (0.40 \times 10) + (0.20 \times 5) = 12.50\%$   
 Benchmark (bogey):  $(0.15 \times 12) + (0.30 \times 15) + (0.45 \times 14) + (0.10 \times 12) = \underline{13.80\%}$   
 Added value:  $-1.30\%$

b. Added value from country allocation:

Country	(1) Excess weight (Manager – benchmark)	(2) Index Return minus bogey	(3) = (1) × (2) Contribution to performance
U.K.	0.15%	-1.8%	-0.27%
Japan	-0.20%	1.2%	-0.24%
U.S.	-0.05%	0.2%	-0.01%
Germany	0.10%	-1.8%	-0.18%
Contribution of country allocation:			-0.70%

c. Added value from stock selection:

Country	(1) Differential return within country (Manager – Index)	(2) Manager's country weight	(3) = (1) × (2) Contribution to performance
U.K.	8%	0.30%	2.4%
Japan	0%	0.10%	0.0%
U.S.	-4%	0.40%	-1.6%
Germany	-7%	0.20%	-1.4%
Contribution of stock selection:			-0.6%

Summary:

Country allocation	-0.70%
<u>Stock selection</u>	<u>-0.60%</u>
Excess performance	-1.30%