ANSWERS TO STUDY QUESTIONS

Chapter 25

25.1. The two major types of errors are random noise and systematic bias most commonly in the form of a temporal lag and/or smoothing bias.

25.3. In the context of appraisal valuations of individual properties, temporal lag bias refers to the tendency of the appraisal valuation to have an expected value equal to the true value of the property as of some point in past time (prior to the "as of" date of the appraisal). This is typically caused by the need of appraisers to base their estimations on (and document them explicitly by) hard empirical evidence about property pricing, and such evidence is largely provided by past sales of similar properties ("comps"). The probability distribution of the appraisal valuation is thus distributed not around the current true value of the property but around some prior true value.

25.5. The "noise-versus-lag trade-off" refers to the fact that in general most ways to help the appraiser reduce the amount of random noise in the valuation estimate tend to introduce more temporal lag bias, and vice versa most ways to reduce the lag bias tend to introduce more random noise. The terms of the tradeoff become more favorable the denser (in time) is the comparable sale evidence, as that increases the sample size of comparable property sales that can be used as evidence to make the valuation estimate. According to the "Square Root of N Rule" of statistics, the standard error of an estimate of a population (true) value is inversely proportional to the square root of the number of observations in the estimation sample drawn from the population. In the appraisal context, the more good comps available in the present (or very recent past) period, the more accurate (less noisy) one can make the appraisal without going so far back in time for the evidence, or (equivalently) the more one can rely just on current or nearly current market pricing evidence without sacrificing accuracy (i.e., without adding noise to the valuation estimate).

25.7. Appraisal-based returns lag true contemporaneous transaction-based returns, which causes them to understate both the standard deviation of real estate returns and the correlation of real estate and stock returns. As a result, portfolio optimization models may tend to show a much larger role for real estate than is actually warranted.

25.9. (See section 25.3 in the text.)

25.11. As of 2012, the indices publicly available in the United States for tracking commercial property prices and investment performance included appraisal-based (such as NCREIF and IPD), transaction price based (such as NTBI, CPPI, CCRSI), and stock market–based (such as FTSE-NAREIT PureProperty™).

25.13. a. Best estimate of $C = V^* = (\$2{,}650{,}000 + \$2{,}450{,}000 + \$2{,}400{,}000)/3 = \$2{,}500{,}000$

b. Best estimate of $C = V^* = (\$2{,}650{,}000 + \$2{,}450{,}000 + \$2{,}400{,}000 + \$2{,}550{,}000)/4 = \$2{,}512{,}500$

c. Market value is unobservable, so nobody can know for certain what the fourth property's market value was as of the date it sold, but our best guess is $2,512,500, calculated as in (b).

d.

$$e_1 = \$2{,}650{,}000 - \$2{,}512{,}500 = +\$137{,}500$$
$$e_2 = \$2{,}450{,}000 - \$2{,}512{,}500 = +\$62{,}500$$
$$e_3 = \$2{,}400{,}000 - \$2{,}512{,}500 = -\$112{,}000$$
$$e_4 = \$2{,}550{,}000 - \$2{,}512{,}500 = +\$137{,}500$$

25.15. The best estimate of the long-run beta would be

$$\widehat{\beta} = 0.05 + 0.15 + 0.10 = 0.30$$