

5

SAMPLING AND ESTIMATION

1. Shawn Choate wants to choose a variable of study that has the most desirable statistical properties. The statistic he is presently considering has the following characteristics:
- The expected value of the sample mean is equal to the population mean.
 - The variance of the sampling distribution is smaller than that for other estimators of the parameter.
 - As the sample size increases, the standard error of the sample mean increases and the sampling distribution is centered more closely on the mean.

Choate's estimator is:

- (A) efficient and consistent.
- (B) unbiased and efficient.
- (C) unbiased and consistent.

2. The central limit theorem states that, for any distribution, as n gets larger, the sampling distribution:
- (A) approaches a normal distribution.
 - (B) approaches the mean.
 - (C) becomes larger.

3. A scientist working for a pharmaceutical company tries many models using the same data before reporting the one that shows that the given drug has no serious side effects.

The scientist's results are *most likely to* exhibit:

- (A) data snooping bias.
- (B) look-ahead bias.
- (C) sample selection bias.

4. A study finds that stocks with low price-to-book-value ratios, using end-of-year stock prices and book values per share, have positive abnormal returns in January on average. This study most likely suffers from:
- (A) time-period bias.
 - (B) sample selection bias.
 - (C) look-ahead bias.

5. Which of the following is the best method to avoid data snooping bias when testing a profitable trading strategy?
 - (A) Test the strategy on a different data set than the one used to develop the rules.
 - (B) Use a sample free of survivorship bias.
 - (C) Increase the sample size to at least 30 observations per year.

6. The sample mean return of Bartlett Co. is 3% and the standard deviation is 6% based on 30 monthly returns. What is the confidence interval of a two tailed z-test of the population mean with a 5% level of significance?
 - (A) 0.85 to 5.15.
 - (B) 1.90 to 4.10.
 - (C) 2.61 to 3.39.

7. Sampling error can be defined as:
 - (A) rejecting the null hypothesis when it is true.
 - (B) the difference between a sample statistic and its corresponding population parameter.
 - (C) the standard deviation of a sampling distribution of the sample means.

8. Which of the following statements about confidence intervals is least accurate? A confidence interval:
 - (A) expands as the probability that a point estimate falls within the interval decreases.
 - (B) has a significance level that is equal to one minus the degree of confidence.
 - (C) is constructed by adding and subtracting a given amount from a point estimate.

9. A sample of size $n = 25$ is selected from a normal population. This sample has a mean of 15 and a sample variance of 4. What is the standard error of the sample mean?
 - (A) 0.4.
 - (B) 0.8.
 - (C) 2.0.

10. A sample of 25 junior financial analysts gives a mean salary (in thousands) of 60. Assume the population variance is known to be 100. A 90% confidence interval for the mean starting salary of junior financial analysts is most accurately constructed as:
 - (A) $60 \pm 1.645(10)$.
 - (B) $60 \pm 1.645(4)$.
 - (C) $60 \pm 1.645(2)$.

11. A research paper that reports finding a profitable trading strategy without providing any discussion of an economic theory that makes predictions consistent with the empirical results is most likely evidence of:
 - (A) a non-normal population distribution
 - (B) a sample that is not large enough.
 - (C) data snooping.

12. Student's t-Distribution

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.025	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001
24	1.318	1.711	2.064	2.492	2.797	3.745
25	1.316	1.708	2.060	2.485	2.787	3.725
26	1.315	1.706	2.056	2.479	2.779	3.707
27	1.314	1.703	2.052	2.473	2.771	3.690

Books Fast, Inc., prides itself on shipping customer orders quickly. Books Fast sampled 27 of its customers within a 200-mile radius and found a mean delivery time of 76 hours, with a sample standard deviation of 6 hours. Based on this sample and assuming a normal distribution of delivery times, what is the confidence interval for the mean delivery time at 5% significance?

- (A) 73.63 to 78.37 hours.
- (B) 68.50 to 83.50 hours.
- (C) 65.75 to 86.25 hours.

13. The range of possible values in which an actual population parameter may be observed at a given level of probability is known as a:

- (A) degree of confidence.
- (B) significance level.
- (C) confidence interval.

14. If the true mean of a population is 16.62, according to the central limit theorem, the mean of the distribution of sample means, for all possible sample sizes n will be:

- (A) indeterminate for sample with $n < 30$.
- (B) $16.62 / \sqrt{n}$.
- (C) 16.62.

15. Student's t-Distribution

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.025	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001
40	1.303	1.684	2.021	2.423	2.704	3.551
60	1.296	1.671	2.000	2.390	2.660	3.460
120	1.289	1.658	1.980	2.358	2.617	3.373

The approximate 99% confidence interval for the population mean based on a sample of 60 returns with a mean of 7% and a sample standard deviation of 25% is closest to:

- (A) -1.584% to 15.584%.
- (B) 0.546% to 13.454%.
- (C) 1.584% to 14.584%.

16. The average annual return over 20 years for a sector of mutual funds, calculated for the population of funds in that sector that have 20 years of performance history, is most likely to:
- (A) overstate returns for the fund sector.
 - (B) understate returns for the fund sector.
 - (C) fairly state returns for the fund sector.
17. A sample of 100 individual investors has a mean portfolio value of \$28,000 with a standard deviation of \$4,250. The 95% confidence interval for the population mean is closest to:
- (A) \$27,575 to \$28,425.
 - (B) \$19,500 to \$28,333.
 - (C) \$27,159 to \$28,842.
18. To estimate the average time Level I CFA candidates spend preparing for the exam, an employee of ABC Investments decides to randomly survey candidates who work at ABC's offices, although he is unsure how well they represent the candidate population. This is most likely an example of:
- (A) judgmental sampling
 - (B) stratified sampling.
 - (C) convenience sampling.
19. Suppose the mean debt/equity ratio of the population of all banks in the United States is 20 and the population variance is 25. A banking industry analyst uses a computer program to select a random sample of 50 banks from this population and compute the sample mean. The program repeats this exercise 1000 times and computes the sample mean each time. According to the central limit theorem, the sampling distribution of the 1000 sample means will be approximately normal if the population of bank debt/equity ratios has:
- (A) a normal distribution, because the sample is random.
 - (B) a Student's t-distribution, because the sample size is greater than 30.
 - (C) any probability distribution.

20. Student's t-Distribution

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.025	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001
30	1.310	1.697	2.042	2.457	2.750	3.646
40	1.303	1.684	2.021	2.423	2.704	3.551
60	1.296	1.671	2.000	2.390	2.660	3.460
120	1.289	1.658	1.980	2.358	2.617	3.373

Based on Student's t-distribution, the 95% confidence interval for the population mean based on a sample of 40 interest rates with a sample mean of 4% and a sample standard deviation of 15% is *closest to*:

- (A) -0.794% to 8.794%.
- (B) -0.851 % to 8.851%.
- (C) 1.261 % to 6.739%.

21. Student's t-Distribution

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.014	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001
18	1.330	1.734	2.101	2.552	2.878	3.992
19	1.328	1.729	2.093	2.539	2.861	3.883
20	1.325	1.725	2.086	2.528	2.845	3.850

A traffic engineer is trying to measure the effects of carpool-only lanes on the expressway. Based on a sample of 20 cars at rush hour, he finds that the mean number of occupants per car is 2.5, with a standard deviation of 0.4. If the population is normally distributed, a 95% confidence interval for the number of occupants per car is:

- (A) 2.313 to 2.687.
- (B) 2.387 to 2.613.
- (C) 2.410 to 2.589.

22. A local high school basketball team had 18 home games this season and averaged 58 points per game. If we assume that the number of points made in home games is normally distributed, which of the following is *most likely the* range of points for a confidence interval of 90%?

- (A) 34 to 82.
- (B) 26 to 80.
- (C) 24 to 78.

23. To test the hypothesis that actively managed international equities mutual funds outperformed an appropriate benchmark index, an analyst selects all of the current international equities funds that have been in existence for at least 10 years. His test results will *most likely* be subject to:

- (A) time period bias.
- (B) look-ahead bias.
- (C) survivorship bias.

24. A study reports that from 2002 to 2004 the average return on growth stocks was twice as large as that of value stocks. These results *most likely* reflect:

- (A) time-period bias.
- (B) survivorship bias.
- (C) look-ahead bias.

25. Joseph Lu calculated the average return on equity at 14% for a sample of 64 companies. The sample standard deviation is 16%. The standard error of the mean is *closest to*:
- (A) 0.0025.
 - (B) 0.0200.
 - (C) 0.0175.

26. Student's t-Distribution

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.025	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001
24	1.318	1.711	2.064	2.492	2.797	3.745
25	1.316	1.708	2.060	2.485	2.787	3.725
26	1.315	1.706	2.056	2.479	2.779	3.707
27	1.314	1.703	2.052	2.473	2.771	3.690

A random sample of 25 Indiana farms had a mean number of cattle per farm of 27 with a sample standard deviation of five. Assuming the population is normally distributed, what would be the 95% confidence interval for the number of cattle per farm?

- (A) 25 to 29.
- (B) 22 to 32.
- (C) 23 to 31.

27. The practice of repeatedly using the same database to search for patterns until one is found is *most likely to* result in:
- (A) look-ahead bias.
 - (B) sample selection bias.
 - (C) data snooping bias.

28. Which of the following statements about a confidence interval for a population mean is *most accurate*?
- (A) For a sample size of 30, using a t-statistic will result in a wider confidence interval for a population mean than using a z-statistic.
 - (B) If the population variance is unknown, a large sample size is required in order to estimate a confidence interval for the population mean.
 - (C) When a z-statistic is acceptable, a 95% confidence interval for a population mean is the sample mean plus-or-minus 1.96 times the sample standard deviation.

29. A traffic engineer is trying to measure the effects of carpool-only lanes on the expressway. Based on a sample of 100 cars at rush hour, he finds that the mean number of occupants per car is 2.5, and the sample variance is 0.16. What is the standard error of the sample mean?
- (A) 0.04.
 - (B) 5.68.
 - (C) 0.016.

30. Which of the following statements about sampling and estimation is *most accurate*?
- (A) The probability that a parameter lies within a range of estimated values is given by α .
 - (B) The standard error of the sample means when the standard deviation of the population is known equals σ / \sqrt{n} , where σ = sample standard deviation adjusted by $n - 1$.
 - (C) The standard error of the sample means when the standard deviation of the population is unknown equals s / \sqrt{n} , where s = sample standard deviation.
31. An efficient estimator is *most accurately described* as one that:
- (A) has a sampling distribution with a smaller variance than that of all other unbiased estimators of the parameter.
 - (B) becomes more accurate as the sample size increases.
 - (C) has an expected value equal to the parameter it is estimating.
32. Which of the following would result in a wider confidence interval? A:
- (A) higher alpha level.
 - (B) greater level of significance.
 - (C) higher degree of confidence.
33. The central limit theorem concerns the sampling distribution of the:
- (A) sample standard deviation.
 - (B) sample mean.
 - (C) population mean.
34. As a sample size is increased, which of the following statements *best* describes the change in the standard error of the sample mean and the size of the confidence interval for the true mean?
- (A) The standard error decreases and the confidence interval narrows.
 - (B) The confidence interval widens while the standard error decreases.
 - (C) The standard error increases while the confidence interval narrows.
35. If the number of offspring for females of a certain mammalian species has a mean of 16.4 and a standard deviation of 3.2, what will be the standard error of the sample mean for a survey of 25 females of the species?
- (A) 1.56.
 - (B) 0.07.
 - (C) 0.64.
36. Which of the following is *least likely* a step in stratified random sampling?
- (A) The population is divided into strata based on some classification scheme.
 - (B) The size of each sub-sample is selected to be the same across strata.
 - (C) The sub-samples are pooled to create the complete sample.

37. An equity analyst needs to select a representative sample of manufacturing stocks. Starting with the population of all publicly traded manufacturing stocks, she classifies each stock into one of the 20 industry groups that form the Index of Industrial Production for the manufacturing industry. She then selects four stocks from each industry. The sampling method the analyst is using is *best* characterized as:
- (A) systematic sampling.
 - (B) random sampling.
 - (C) stratified random sampling.
38. The average U.S. dollar/Euro exchange rate from a sample of 36 monthly observations is \$1.00/Euro. The population variance is 0.49. What is the 95% confidence interval for the mean U.S. dollar/Euro exchange rate?
- (A) \$0.7713 to \$1.2287.
 - (B) \$0.5100 to \$1.4900.
 - (C) \$0.8075 to \$1.1925.
39. The following data are available on a sample of advertising budgets of 81 U.S. manufacturing companies: The mean budget is \$10 million. The sample variance is 36 million. The standard error of the sample mean is:
- (A) \$667.
 - (B) \$400.
 - (C) \$1,111.
40. From a population with a standard deviation of 15, a sample of 25 observations is taken. The standard error of the sample mean is:
- (A) 1.67.
 - (B) 3.00.
 - (C) 0.60.
41. In which one of the following cases is the t-statistic the appropriate one to use in the construction of a confidence interval for the population mean?
- (A) The distribution is nonnormal, the population variance is known, and the sample size is at least 30.
 - (B) The distribution is normal, the population variance is known, and the sample size is less than 30.
 - (C) The distribution is nonnormal, the population variance is unknown, and the sample size is at least 30.
42. The sample mean is an unbiased estimator of the population mean because the:
- (A) expected value of the sample mean is equal to the population mean.
 - (B) sampling distribution of the sample mean has the smallest variance of any other unbiased estimators of the population mean.
 - (C) sample mean provides a more accurate estimate of the population mean as the sample size increases.

43. Which of the following statements about sampling and estimation is *most* accurate?
- (A) A point estimate is a single estimate of an unknown population parameter calculated as a sample mean.
 - (B) Time-series data are observations over individual units at a point in time.
 - (C) A confidence interval estimate consists of a range of values that bracket the parameter with a specified level of probability, $1 - \beta$.
44. What is the 95% confidence interval for a population mean with a known population variance of 9, based on a sample of 400 observations with mean of 96?
- (A) 95.706 to 96.294.
 - (B) 95.613 to 96.387.
 - (C) 95.118 to 96.882.

45. Student's t-Distribution

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.025	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001
40	1.303	1.684	2.021	2.423	2.704	3.551
60	1.296	1.671	2.000	2.390	2.660	3.460
120	1.289	1.658	1.980	2.358	2.617	3.373

From a sample of 41 monthly observations of the S&P Mid-Cap index, the mean monthly return is 1% and the sample variance is 36. For which of the following intervals can one be *closest to 95%* confident that the population mean is contained in that interval?

- (A) $1.0\% \pm 1.6\%$.
- (B) $1.0\% \pm 6.0\%$.
- (C) $1.0\% \pm 1.9\%$.

46. Cumulative Z-Table

Z	0.05	0.06	0.07	0.08	0.09
2.4	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9970	0.9971	0.9972	0.9973	0.9974

The average return on the Russell 2000 index for 121 monthly observations was 1.5%. The population standard deviation is assumed to be 8.0%. What is a 99% confidence interval for the mean monthly return on the Russell 2000 index?

- (A) 0.1% to 2.9%.
- (B) -0.4% to 3.4%.
- (C) -6.5% to 9.5%.

47. A statistical estimator is unbiased if:
- (A) the variance of its sampling distribution is smaller than that of all other estimators.
 - (B) an increase in sample size decreases the standard error.
 - (C) the expected value of the estimator is equal to the population parameter.
48. An analyst divides the population of U.S. stocks into 10 equally sized sub-samples based on market value of equity. Then he takes a random sample of 50 from each of the 10 sub-samples and pools the data to create a sample of 500. This is an example of:
- (A) simple random sampling.
 - (B) stratified random sampling.
 - (C) systematic cross-sectional sampling.
49. Which of the following characterizes the typical construction of a confidence interval *most* accurately?
- (A) Point estimate +/- (Standard error / Reliability factor).
 - (B) Point estimate +/- (Reliability factor x Standard error).
 - (C) Standard error +/- (Point estimate / Reliability factor).
50. An analyst is asked to select a sample of securities from those included in a broad-based index that can be expected to have the same return as the index while preserving the key risk exposures of the index. The analyst should *most appropriately* use:
- (A) stratified random sampling.
 - (B) constrained random sampling.
 - (C) simple random sampling.
51. Melissa Cyprus, CFA, is conducting an analysis of inventory management practices in the retail industry. She assumes the population cross-sectional standard deviation of inventory turnover ratios is 20. How large a random sample should she gather in order to ensure a standard error of the sample mean of 4?
- (A) 20.
 - (B) 25.
 - (C) 80.
52. Which of the following statements regarding confidence intervals is most accurate?
- (A) The lower the degree of confidence, the wider the confidence interval.
 - (B) The lower the significance level, the wider the confidence interval.
 - (C) The higher the significance level, the wider the confidence interval.
53. Stratified random sampling is most often used to preserve the distribution of risk factors when creating a portfolio to track an index of:
- (A) stocks.
 - (B) corporate bonds.
 - (C) alternative investments.

54. Thomas Merton, a car industry analyst, wants to investigate a relationship between the types of ads used in advertising campaigns and sales to customers in certain age groups. In order to make sure he includes manufacturers of all sizes, Merton divides the industry into four size groups and draws random samples from each group. What sampling method is Merton using?
- (A) Simple random sampling.
 - (B) Cross-sectional sampling.
 - (C) Stratified random sampling.
55. Which of the following statements about sampling errors is *least accurate*?
- (A) Sampling error is the difference between a sample statistic and its corresponding population parameter.
 - (B) Sampling error is the error made in estimating the population mean based on a sample mean.
 - (C) Sampling errors are errors due to the wrong sample being selected from the population.
56. An auditor who decides to handpick rather than randomly select transactions to examine for instances of fraud is most likely using:
- (A) judgmental sampling.
 - (B) convenience sampling.
 - (C) cluster sampling.
57. From a population of 5,000 observations, a sample of $n = 100$ is selected. Calculate the standard error of the sample mean if the population variance is 2500.
- (A) 5.00.
 - (B) 250.
 - (C) 0.2.
58. The sample mean is a consistent estimator of the population mean because the:
- (A) expected value of the sample mean is equal to the population mean.
 - (B) sampling distribution of the sample mean has the smallest variance of any other unbiased estimators of the population mean.
 - (C) sample mean provides a more accurate estimate of the population mean as the sample size increases.
59. When sampling from a population, the most appropriate sample size:
- (A) is at least 30.
 - (B) minimizes the sampling error and the standard deviation of the sample statistic around its population value.
 - (C) involves a trade-off between the cost of increasing the sample size and the value of increasing the precision of the estimates.

60. The average return on small stocks over the period 1926-1997 was 17.7%, and the standard deviation of the sample was 33.9%. Assuming returns are normally distributed, the 95% confidence interval for the return on small stocks next year is:
- (A) 16.8% to 18.6%.
 - (B) -16.2% to 51.6%.
 - (C) -48.7% to 84.1 %.
61. According to the Central Limit Theorem, the distribution of the sample means is approximately normal if:
- (A) the sample size $n > 30$.
 - (B) the standard deviation of the population is known.
 - (C) the underlying population is normal.
62. A nursery sells trees of different types and heights. Suppose that 75 trees chosen at random are sold for planting at City Hall. These 75 trees average 60 inches in height with a standard deviation of 16 inches.
Using this information, construct a 95% confidence interval for the mean height of all trees in the nursery.
- (A) $60 \pm 1.96(1.85)$.
 - (B) $0.8 \pm 1.96(16)$.
 - (C) $60 \pm 1.96(16)$.
63. Fred's Correspondence College wants to construct a 90% confidence interval for the mean starting salaries of its graduates. A sample of 100 recent graduates has a mean of \$50,000 and a standard deviation of \$30,000. Assuming the population of graduates' starting salaries is normally distributed, the College's confidence interval is *closest to*:
- (A) \$44,000 to \$56,000.
 - (B) \$0 to \$100,000.
 - (C) \$45,000 to \$55,000.
64. A range of estimated values within which the actual value of a population parameter will lie with a given probability of $1 - \alpha$ is a (n):
- (A) a percent confidence interval
 - (B) a percent point estimate
 - (C) $(1 - \alpha)$ percent confidence interval.
65. In a confidence interval for the mean of a normally distributed population with a sample size of 25, it is *least likely that*:
- (A) a t-distributed test statistic is appropriate if the population variance is unknown.
 - (B) a z-distributed test statistic is appropriate if the population variance is known.
 - (C) no test statistic is available.

66. A sample size of 25 is selected from a normal population. This sample has a mean of 15 and the population variance is 4. Using this information, construct a 95% confidence interval for the population mean, μ .
- (A) $15 \pm 1.96(0.4)$.
 (B) $15 \pm 1.96(0.8)$.
 (C) $15 \pm 1.96(2)$.
67. An analyst has reviewed market data for returns from 1980-1990 extensively, searching for patterns in the returns. She has found that when the end of the month falls on a Saturday, there are usually positive returns on the following Thursday. She has engaged in:
- (A) biased selection.
 (B) time period bias.
 (C) data snooping.
68. Which of the following is *least likely* a prediction of the central limit theorem?
- (A) The mean of the sampling distribution of the sample means will be equal to the population mean.
 (B) The standard error of the sample mean will increase as the sample size increases.
 (C) The variance of the sampling distribution of sample means will approach the population variance divided by the sample size.

69. Student's t-Distribution

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.025	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001
30	1.310	1.697	2.042	2.457	2.750	3.646
40	1.303	1.684	2.021	2.423	2.704	3.551
60	1.296	1.671	2.000	2.390	2.660	3.460
120	1.289	1.658	1.980	2.358	2.617	3.373

From a sample of 41 orders for an on-line bookseller, the average order size is \$75, and the sample standard deviation is \$18. Assume the distribution of orders is normal. For which interval can one be exactly 90% confident that the population mean is contained in that interval?

- (A) \$71.29 to 78.71.
 (B) \$70.27 to \$79.73.
 (C) \$74.24 to \$75.76.

70. An article in a trade journal suggests that a strategy of buying the seven stocks in the S&P 500 with the highest earnings-to-price ratio at the end of the calendar year and holding them until March 20 of the following year produces significant trading profits. Upon reading further, you discover that the study is based on data from 1993 to 1997, and the earnings-to-price ratio is calculated using the stock price on December 31 of each year and the annual reported earnings per share for that year. Which of the following biases is *least likely* to influence the reported results?
- (A) Look-ahead bias.
 - (B) Survivorship bias.
 - (C) Time-period bias.
71. An analyst has compiled stock returns for the first 10 days of the year for a sample of firms and estimated the correlation between these returns and changes in book value for these firms over the just ended year. What objection could be raised to such a correlation being used as a trading strategy?
- (A) Use of year-end values causes time-period bias.
 - (B) The study suffers from look-ahead bias.
 - (C) Use of year-end values causes sample selection bias.
72. A traffic engineer is trying to measure the effects of carpool-only lanes on the expressway. Based on a sample of 1,000 cars at rush hour, he finds that the mean number of occupants per car is 2.5, with a standard deviation of 0.4. Assuming that the population is normally distributed, what is the confidence interval at the 5% significance level for the number of occupants per car?
- (A) 2.288 to 2.712.
 - (B) 2.455 to 2.555.
 - (C) 2.475 to 2.525.
73. Which of the following statements regarding the central limit theorem (CLT) is *least* accurate? The CLT:
- (A) gives the variance of the distribution of sample means as σ^2 / n , where σ^2 is the population variance and n is the sample size.
 - (B) states that for a population with mean μ and variance σ^2 , the sampling distribution of the sample means for any sample of size n will be approximately normally distributed.
 - (C) holds for any population distribution, assuming a large sample size.
74. Sampling error is the:
- (A) difference between the point estimate of the mean and the mean of the sampling distribution.
 - (B) estimation error created by using a non-random sample.
 - (C) difference between a sample statistic and its corresponding population parameter.

75. Student's t-Distribution

Level of Significance for One-Tailed Test						
df	0.100	0.050	0.025	0.01	0.005	0.0005
Level of Significance for Two-Tailed Test						
df	0.20	0.10	0.05	0.02	0.01	0.001
40	1.303	1.684	2.021	2.423	2.704	3.551
60	1.296	1.671	2.000	2.390	2.660	3.460
120	1.289	1.658	1.980	2.358	2.617	3.373

The average salary for a sample of 61 CFA charterholders with 10 years of experience is \$200,000, and the sample standard deviation is \$80,000. Assume the population is normally distributed. Which of the following is a 99% confidence interval for the population mean salary of CFA charterholders with 10 years of experience?

- (A) \$172,754 to \$227,246.
- (B) \$160,000 to \$240,000.
- (C) \$172,514 to \$227,486.

