LO.a: Describe a security market index.

1. Analyst 1: A security market index represents the level of risk in the market.
   Analyst 2: A security market index represents the security market, market segment or asset class.
   Which analyst's statement is *most likely* correct?
   A. Analyst 1.
   B. Analyst 2.
   C. Neither.

2. Which of the following is *least likely* true with regards to security market indices?
   A. Security market indices measure the value of different target markets.
   B. Index values are calculated using estimated or actual values of constituent securities.
   C. Once defined, the constituent securities are not changed.

LO.b: Calculate and interpret the value, price return, and total return of an index.

3. Index P is a price return index. Index T is a total return index. Both have a starting value of 1000. Both have the same underlying securities and weighting system. Six months after inception the two index values will *most likely* be equal if:
   A. the indices have not been rebalanced.
   B. the indices have not been reconstituted.
   C. the constituent securities do not pay dividends or interest.

4. An analyst gathers the following information for KSE3 index comprised of HBL, FFCL and EFOODS. This is a price-weighted index.

Security	Beginning of period price (Rs.)	End of period price (Rs.)	Total Dividend (Rs.)
HBL	148	153	8
FFCL	104	110	5
EFOODS	110	90	4

The price return of the index is *closest* to:
A. -2.5%.
B. -2.9%.
C. -10.9%.

5. A market-capitalization-weighted index consists of securities ABC, DEF and GHI:

Security	Beginning of Period Price	End of Period Price	Dividends per share	Share Outstanding
ABC	1,500	1,700	10	6,000
DEF	2,500	1,500	15	8,500
GHI	500	600	10	10,000

The price return of the index is *closest* to:
A. -10.33%.
B. -17.87%.

C. -13.90%.

6. Peter gathers the following information for a market-capitalization- weighted index comprised of securities ABC, DEF and GHI.

Security	Beginning of period price	End of period price	Dividends per share	Shares outstanding
ABC	1,500	1,700	10	6,000
DEF	2,500	1,500	15	8,500
GHI	500	600	10	10,000

The total return of the index is *closest* to:
A. 1.04%.
B. -17.06%.
C. -10.23%.

7. An analyst gathers the following data for a price-weighted index:

	Beginning of period		End of period	
Security	**Price $**	**Shares**	**Price $**	**Shares**
A	10	100	15	100
B	40	150	38	150
C	16	200	20	200

The price return of the index over the period is *closest* to:
A. 10.61%.
B. 17.1%.
C. 21.4%.

8. John gathers the following data for a value-weighted index:

	Beginning of period		End of period	
Security	**Price $**	**Shares**	**Price $**	**Shares**
A	10	100	15	100
B	40	150	38	150
C	16	200	20	200

The return on the value-weighted index over the period is *closest* to:
A. 7.1%.
B. 9.8%.
C. 11.4%.

9. John gathers the following data for an equally-weighted index:

	Beginning of period		End of period	
Security	**Price $**	**Shares**	**Price $**	**Shares**
A	10	100	15	100
B	40	150	38	150
C	16	200	20	200

The return on the index over the period is *closest* to:

A. 25.2%.
B. 16.8%.
C. 23.3%.

10. Alex gathers the following information for an equal-weighted index comprised of assets A, B, and C:

Security	Beginning of period price $	End of period price $	Total Dividends $
A	20	15	2
B	40	48	4
C	60	60	9

What is the price return of the index?

A. 10.0%.
B. -1.7%.
C. -2.5%.

11. Alex gathers the following information for an equal-weighted index comprised of assets A, B, and C:

Security	Beginning of period price $	End of period price $	Total Dividend $
A	20	15	2
B	40	48	4
C	60	60	9

The total return of the index is *closest* to:

A. 5.0%.
B. 7.5%.
C. 10.0%.

LO.c: Describe the choices and issues in index construction and management.

12. The second major question to address when constructing an index is *most likely*:

A. What is the target market?
B. When should the index be rebalanced?
C. Which securities should be selected from the target market?

13. Analyst 1: Objective or mechanical rules are used to determine the constituent securities of most indices.
Analyst 2: Some indices use a selection committee and subjective decision making rules to determine constituent securities.
Which analyst's statement is *most likely* correct?

A. Analyst 1.
B. Analyst 2.
C. Both.

LO.d: Compare the different weighting methods used in index construction.

14. The index weighting method that requires adjustment to the divisor after a stock split is:
    A. price weighting.
    B. equal weighting.
    C. float adjusted market-capitalization weighting.

15. Which of the index weighting methods leads to indices that have a value tilt?
    A. Market-capitalization weighting.
    B. Fundamental weighting.
    C. Float-adjusted market-capitalization weighting.

16. The index weighting that has a momentum effect is *most likely* to be:
    A. equal weighted.
    B. fundamental weighted.
    C. market-capitalization weighted.

17. Jim is looking for a method that is *least likely* to require rebalancing. Which one of the following methods would Jim select?
    A. price weighting.
    B. equal weighting.
    C. fundamental weighting.

18. Which of the following is *least likely* a characteristic of fundamental weighting of an index?
    A. Index will have a contrarian effect.
    B. Index will use multiple measures to weigh constituent securities.
    C. Index will include all shares.

19. Which of the following type of market index *most likely* requires frequent rebalancing?
    A. Equal weighted.
    B. Market-capitalization weighted.
    C. Price weighted.

20. Contrarian "effect" is *most likely* a characteristic of which of the following types of index weighting methods?
    A. Market capitalization weighting.
    B. Price weighting.
    C. Fundamental weighting.

21. High transaction costs reduce portfolio returns due to rebalancing. Which of the following indices is *most likely* to experience this?
    A. Equal weighted.
    B. Price weighted.
    C. Value weighted.

LO.e: Calculate and analyze the value and return of an index given its weighting method.

22. The following information is available for an index:
Value of the index as of December 31, 2012: 1,000
Interest income over the year 2012: 45.50
Dividend income over the year 2012: 12.00
Total return of the index over the year 2012: -3.50%
The value of the index as of January 1, 2012 is *closest* to:
    A. 1,073.
    B. 1,084.
    C. 1,096.

23. The index weighting method that *most likely* requires an adjustment to the divisor after a stock split is:
    A. fundamental weighting.
    B. market-capitalization weighting.
    C. price weighting.

24. The data for four stocks in a price-return index are as follows:

Stock	Shares Outstanding	% Shares in Market Float	Beginning of Period Price ($)	End of Period Price ($)	Dividends Per Share ($)
1	2000	80	25	28	1.5
2	5000	90	13	11	2.0
3	4000	60	44	42	2.5
4	6000	50	38	45	1.5

Assuming the beginning value of the float-adjusted market-capitalization-weighted equity index is 100, the ending value is *closest* to:
    A. 103.8.
    B. 105.8.
    C. 110.7.

LO.f: Describe rebalancing and reconstitution of an index.

25. Rebalancing is *most likely* to involve:
    A. adding or removing securities to maintain consistency with the target market.
    B. adjusting securities' weight to keep the turnover stable.
    C. adjusting securities' weights to maintain consistency with the index's weighting method.

26. What does reconstitution of a security market index help reduce?
    A. Portfolio turnover.
    B. Market-capitalization weighting of the index.
    C. The likelihood that the index includes securities that are not representative of the target market.

LO.g: Describe uses of security market indices.

27. Which of the following is *least likely* true about security market indices?
    A. Indices allow us to gauge market sentiment.
    B. Indices serve as investment vehicles.
    C. Indices serve as a basis for investment products.

28. Analyst 1: Security market indices serve as market proxies when measuring risk-adjusted performance.
    Analyst 2: Security market indices are often used as benchmarks to evaluate the performance of active portfolio managers.
    Which analyst's statement is *most likely* correct?
    A. Analyst 1.
    B. Analyst 2.
    C. Both.

LO.h: Describe types of equity indices.

29. An index that contains securities with more than 90% of the market's total value is *most likely* a:
    A. broad market index.
    B. sector index.
    C. multi-market index.

30. An example of a style index is an:
    A. index based on geographic regions.
    B. index based on economic sector.
    C. index based on value stocks.

LO.i: Describe types of fixed-income indices.

31. On the basis of market, fixed income indices can be *least likely* classified as:
    A. global.
    B. currency zone.
    C. investment grade**.**

LO.j: Describe indices representing alternative investments.

32. Which of the following is *least likely* true with regards to hedge fund indices?
    A. Returns are generally overstated.
    B. Hedge funds can decide whether to report their performance to index creators.
    C. Returns are generally understated.

33. What is *most likely* a feature of hedge fund indices? They:
    A. are frequently equal weighted.
    B. are determined by the constituents of index.

C. reflect the value of private rather than public investments.

34. Which of the following statements regarding commodity indices is *least likely* correct?
    A. Most commodity indices use the same weighting methods.
    B. Commodity indices containing the same underlying commodities might have different returns.
    C. Most commodity indices are based on commodity futures contracts.

35. Which of the following is *least likely* to be an issue pertaining to a commodity index?
    A. Commodity indexes are based on future prices, rather than spot prices.
    B. Commodity indexes may vary due to the use of different methodologies of determining weights.
    C. Commodity indexes may show an upward bias due to the reflected performance of only surviving commodities.

LO.k: Compare types of security market indices.

36. An index based on market capitalization *most likely*:
    A. requires frequent rebalancing.
    B. has a value tilt.
    C. is influenced by overpriced securities.

37. An example of a style index is an index based on:
    A. geographic regions.
    B. economic sector.
    C. value stocks.

38. Which of the following is *least likely* a real estate index category?
    A. Repeat sales index.
    B. Initial sales index.
    C. Appraisal index.

39. Tim is working on his assignment to compare equity indices with fixed-income indices. From his class lecture, he recalls that 1) fixed income securities are harder to replicate 2) constituent securities of fixed-income indices are more liquid, and 3) constituent securities of fixed income indices are drawn from a larger pool as compared to securities of equity indices. Out of the three facts he recalls, which of the following is *least likely* correct?
    A. Fixed income securities are harder to replicate.
    B. Constituent securities of fixed-income indices are more liquid.
    C. Constituent securities of fixed income indices drawn from a larger pool.

Solutions

1. B is correct. A security market index represents the security market, market segment or asset class.

2. C is correct. Most major indices are reconstituted periodically.

3. C is correct. Income generated over time by underlying securities in terms of dividend or interest creates a difference between a price return index and a total return index consisting of identical securities and weights. If the securities in the index do not generate income, both indices will be identical in value.

4. A is correct. The price return of the price-weighted index is the percentage change in price of the index: $\frac{353-362}{362}$ = - 2.49%.

Security	Beginning of period price	End of period price
HBL	148	153
FFCL	104	110
EFOODS	110	90
TOTAL	362	353

5. B is correct. The price return of the index is $\frac{28{,}950{,}000 - 35{,}250{,}000}{35{,}250{,}000}$ = -17.87%.

6. B is correct. The total return of the market-capitalization-weighted index is calculated below:

Security	Beginning of Period Value	End of Period Value	Total Dividend	Total Return %
ABC	9,000,000	10,200,000	60,000	14
DEF	21,250,000	12,750,000	127,500	-39.4
GHI	5,000,000	6,000,000	100,000	22
Total	35,250,000	28,950,000	287,500	-17.06

7. A is correct. The sum of prices at the beginning of the period is 66; the sum at the end of the period is 73. Regardless of the divisor, the price return is $\frac{73}{66} - 1$ = 0.1061 or 10.61percent.

8. B is correct. It is the percentage change in the market value over the period:
Market value at beginning of period: $(10 * 100) + (40 * 150) + (16 * 200)$ = 10,200
Market value at end of period: $(15 * 100) + (38 * 150) + (20 * 200)$ = 11,200
Percentage change is $\frac{11{,}200}{10{,}200} - 1$ = 0.09804 or 9.8 percent with rounding.

9. C is correct. With an equal-weighted index, the same amount is invested in each security. Assuming \$500 is invested in each of the three stocks, the index value is \$1,500 at the beginning of the period and the following number of shares is purchased for each stock:
   Security A: 50 shares.
   Security B: 12.5 shares.
   Security C: 31.25 shares.
   Using the prices at the beginning of the period for each security, the index value at the end of the period is \$1,850: $(\$15 * 50) + (\$38 * 12.5) + (\$20 * 31.25)$. The price return is $\frac{\$1,850}{\$1,500} - 1$ = 23.3%.

10. B is correct.
    The price return of the index equals the weighted average of price returns of the individual securities.
    Return of A: -25percent = $\frac{15-20}{20}$
    Return of B: 20 percent = $\left[\frac{48-40}{40}\right]$;
    Return of C: 0 percent = $\left[\frac{60-60}{60}\right]$.
    The price return index assigns equal weights to each asset; therefore, the price return is $\frac{1}{3} * [-25\% + (20\%) + 0\%]$ = -1.7%.

11. C is correct.
    The total return of an index is the price appreciation, or change in the value of the price return index, plus income (dividends and/or interest) over the period, expressed as a percentage of the beginning value of the price return index.
    Return of A: $\frac{15-20+2}{20}$ = -15%
    Return of B: $\frac{48-40+4}{40}$ = 30%
    Return of C: $\frac{60-60+9}{60}$ = 15%
    An equal-weighted index applies equal weight to each security's return; therefore, the total return = $\frac{1}{3} * (-15\% + 30\% + 15\%)$ = 10%.

12. C is correct. The first major question to address is what is the target market? The second major question is what securities to select from the target market?

13. C is correct. Both statements are correct.

14. A is correct. The index weighting method that requires an adjustment to the divisor after a stock split is the price weighing method.

15. B is correct. Fundamental weighting leads to indices that have a value tilt.

16. C is correct. Market capitalization weighted indices generally will have a momentum “effect”.

17. A is correct. Equal weighing and fundamental weighting methods require rebalancing. Price weighting does not require rebalancing.

18. B is correct. Fundamental indices use a single measure, such as total dividends, to weight the constituent securities. Fundamentally weighted indices generally will have a contrarian “effect” in that the portfolio weights will shift away from securities that have increased in relative value and toward securities that have fallen in relative value whenever the portfolio is rebalanced. All shares are included in a fundamental weighted index.

19. A is correct. This is because after an equal weighted index is constructed and the prices of constituent securities change, the index is no longer equally weighted. Therefore, maintaining equal weights requires frequent adjustments (rebalancing) to the index.

20. C is correct. Fundamental weighting leads to indices that have a relative value tilt i.e. the contrarian ‘effect’, where portfolio weights will shift away from securities that have increased in relative value and towards securities that have fallen in relative value whenever the portfolio is rebalanced.

21. A is correct. Price and value-weighted are adjusted to their correct values by changes in prices. Therefore, rebalancing is only carried out for equal weighted indexes and these experience high transaction costs.

22. C is correct. The total return of an index is the price appreciation, or change in the value of the price return index, plus income (dividends and/or interest) over the period, expressed as a percentage of the beginning value of the price return index.

    $TR_I = \frac{V_{PRI1} - V_{PRI0} + Inc_I}{V}$

    where

    TR_I = the total return of the index portfolio (as a decimal number)

    V_{PRI1}= the value of the price return index at the end of the period

    V_{PRI0} = the value of the price return index at the beginning of the period

    Inc_1 = the total income (dividends and/or interest) from all securities in the index held over the period

    $-3.5\% = \frac{1000 - V_{PRI0} + 45.5 + 12}{V_{PRI0}}$;

    $V_{PRI0} = \frac{1000 + 45.5 + 12.0}{1 - 3.5\%} = 1{,}096.$

23. C is correct. In the price weighting method, the divisor must be adjusted so the index value immediately after the split is the same as the value immediately prior to split

24. A is correct. This is a price return index (not a total return index). Hence we only consider changes in prices and ignore the dividends. In float-adjusted market-capitalization weighting,

the weight on each constituent security is determined by adjusting its market capitalization for its market float.

Stock	Shares Outstanding	% Shares in Market Float	Shares in Index	Beginning of Period Price ($)	Beg. Float Adj. MarketCap ($)	End of Period Price ($)	Ending Float Adj. Market Cap ($)
	(1)	(2)	(1) * (2) = (3)	(4)	(3) * (4) = (5)	(6)	(3) * (6)
1	2000	80	1600	25	40000	28	44800
2	5000	90	4500	13	58500	11	49500
3	4000	60	2400	44	105600	42	100800
4	6000	50	3000	38	114000	45	135000
Total					318100		330100
Index Value					100.0		**103.8**

As per the computations shown above, the ending value of the index equals 103.8 = $\frac{330,100}{318,100}$

25. C is correct. To maintain the weight of each security consistent with the index's weighing method, the index provider rebalances the index by adjusting the weights of the constituent securities on a regularly scheduled basis.

26. C is correct. Reconstitution is the process of changing the constituent securities in an index. Constituent securities that no longer meet the criteria are replaced with securities that do meet the criteria. Thus, reconstitution reduces the likelihood that the index includes securities that are not representative of the target market.

27. B is correct. Security market indices serve as model portfolios for investment products. We cannot invest directly in an index.

28. C is correct. Both statements about the uses of security market indices are correct.

29. A is correct. A broad market index tries to represent the entire market and usually contains more than 90% of the market's total value.

30. C is correct. Style indices represent groups of securities classified according to market capitalization, value, growth, or a combination of these characteristics

31. C is correct. On the basis of market, fixed income indices are classified as global, regional and country or currency zone.

32. C is correct. Performance reporting is voluntary. Hedge funds with poorer performance may be less likely to report their performance to the database, which make the returns biased upwards.

33. B is correct. Since hedge funds are not required to report their performance to any party except for the investor, therefore constituents determine the hedge fund index rather than the index providers determining the constituents.

34. A is correct. There is no standardization with regards to commodity indices. Different indices will probably use different weighting methods. The other two statements are true.

35. C is correct. Upward bias exists only in the case of *hedge funds* and not in the case of *commodities.* The other two options are definitely issues pertaining to a commodity index.

36. C is correct. Equal-weighted indices require frequent rebalancing. Fundamentals-weighted indices have a value tilt. Market capitalization weighted indices are influenced by overpriced securities.

37. C is correct. Style indices represent groups of securities classified according to market capitalization, value, growth, or a combination of these characteristics.

38. B is correct. Real estate index can be categorized as appraisal index, repeat sales index and real estate investment trust index. Initial sales index is not a real estate index category.

39. B is correct. Constituent securities of fixed-income indices are generally less liquid compared to equity securities.