金程教育 GOLDEN FUTURE

2017 年 12 月 CFA 一级百题预测

1. ETHICS
2. QUANTITATIVE
3. ECONOMICS
4. FINANCIAL STATEMENT ANALYSIS
5. CORPORATE FINANCE
6. EQUITY
7. FIXED INCOME
8. DERIVATIVES
9. ALTERNATIVE INVESTMENTS
10. PORTFOLIO

对于 2017 年 12 月考试，从全局来看，考试的难度在提高；从科目来说，对于占比较高的几门科目需要引起重视，如：财务报表分析、职业伦理和数量分析；从题目的难易程度来说，百题中所标示的基础题目必须掌握。相比较于 2016 年考纲，改动较大的科目是职业伦理、经济学和企业理财，分别增加了一个全新的章节，基本都是定性的内容，百题中这部分的题目是来自原版书及 Mock 中的精选，复习时要花点时间重点掌握。为了全面应对考试，我们全面推出了的各种学习平台，如金程网校、手机 APP、金程 CFA 微信平台答疑等活动，请各位充分利用。如有学术问题，请登录至金程网校提问。祝大家好运！

金程教育 CFA 百题师资团队，为您呈现最完美的百题预测

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2. Quantitative

2.1. Interest Rate

2.1.1. 重要知识点

2.1.1.1. Decompose required rate of return:

- Interest rate = real risk free rate + expected inflation rate + risk premium
- Nominal risk free rate = real risk-free rate + expected inflation rate

2.1.2. 基础题

Q-1. Now, the nominal risk-free rate decreases. Keep the credit risk, liquidity risk and maturity risk constant, if the inflation rate increases, the real risk-free rate will be:

A. Decrease.

B. No change.

C. Increase.

Solution: A.

The real risk free rate equals to the nominal risk-free rate minus the expected inflation rate. If the nominal risk-free rate decrease and expected inflation rate increase, the real risk-free rate should decrease.

2.2. Time Value of Money

2.2.1. 重要知识点

2.2.1.1. Annuities 的计算：FV, PV, required interest, payment

- N = number of periods
- I/Y = interest rate per period
- PMT = amount of each periodic payment
- FV = future value
- Compute (CPT) present value (PV)
- 考察方法：计算——N, I/Y, PMT, FV, PV 中任意给定四个，求另外一个

2.2.2. 基础题

Q-2. For planning purposes, an individual wants to be able to spend €80,000 per year, at the end of each year, for an anticipated 25 years in retirement. In order to fund this retirement account, he will make annual deposits of €6,608 at the end of each of his working years. What is the minimum number of such deposits he will need to make to fund his desired retirement? Use 6% interest compounded annually for all calculations.

A. 29 payments

B. 40 payments

C. 51 payments

Solution: B.

Using a financial calculator, first calculate the needed funds at retirement:

N = 25, I/Y = 6, PMT = 80,000, FV = 0; calculate PV to be 1,022,668.

Then use 1,022,668 as the FV of the accumulation phase annuity:

I/Y = 6, PV = 0, PMT = -6,608, FV = 1,022,668; calculate N. N is 40.

2.3. Calculation of HPR

2.3.1. 重要知识点

2.3.1.1. 概念： Total return an investor earns between the purchase date and the sale or maturity date.

2.3.1.2. 公式： $HPR = \frac{P_1 - P_0 + D_1}{P_0} = \frac{P_1 + D_1}{P_0} - 1$

Notes: 这个指标没有年度化，所以不同的 HPR 是不具可比性的。

2.3.2. 基础题

Q-3. An analyst gathered the following information about a common stock investment:

	Date	Amount
Stock purchase	15 January 2007	48.00
Cash dividend	14 July 2007	4.00
Stock sale	15 July 2007	54.00

The holding period return on the common stock investment is closest to:

A. 12.5%.

B. 20.8%.

C. 25.0%.

Solution: B.

HPR = $(P_1 – P_0 + D_1)/P_0$, where P_0 is the initial investment, P_1 is the price received at the end of the holding period, and D_1 is the cash paid by the investment at the end of the holding period. In this case: HPR = (54 - 48 + 4) / 48 = 20.8%. The HPR is not annualized for holding periods shorter than a year.

2.4. Calculation and conversion among R_{BD}，HPY，EAY and R_{mm}

2.4.1. 重要知识点

2.4.1.1. HPY, r_{MM}, r_{BD}, EAY, BEY 的计算及转化

- $HPY = \frac{P_1 - P_0 + D_1}{P_0}$ or $HPY = \frac{FV - PV}{PV}$
- $r_{MM} = HPY \times \frac{360}{t}$
- $r_{BD} = \frac{F - P_0}{F} \times \frac{360}{t}$
- $EAY = (1 + HPY)^{365/t} - 1$
- $(1 + \frac{BEY}{2})^2 = 1 + EAY = (1 + HPY)^{\frac{365}{t}}$
- 单利时用$\frac{360}{t}$，复利时用$\frac{365}{t}$

2.4.1.2. r_{BD} is not a meaningful measure of investors' return, for three reasons.

- The yield is based on the face value of the bond, not on its purchase price.
- The yield is annualized based on a 360-day year rather than a 365-day year.
- The bank discount yield annualizes with simple interest, which ignores the opportunity to earn interest on interest (compound interest).

2.4.2. 基础题

Q-4. A money manager has $1,000,000 to invest for one year. She has identified two alternative one-year certificates of deposit (CD) shown below:

	Compounding frequency	Annual interest rate
CD1	Quarterly	8.00%
CD2	Continuously	7.95%

Which CD has the *highest* effective annual rate (EAR) and how much interest will it earn?

	Highest EAR	Interest earned
A.	CD1	$82,432
B.	CD2	$82,746
C.	CD2	$83,287

Solution: B.

Quarterly: EAR = $1.02^4 - 1 = 1.082432 - 1 = 0.082432 = 8.2432\%$

Interest = $1,000,000 × 8.2432% = $82,432

Continuous: EAR = $e^{0.0795} - 1 = 0.082746 = 8.2746\%$

Interest = $1,000,000 x 8.2746% = $82,746

Therefore, the CD paying 7.95% compounded continuously offers the highest effective annual

rate.

Q-5. The nominal (quoted) annual interest rate on an automobile loan is 10%. The effective annual rate of the loan is 10.47%. The frequency of compounding periods per year for the loan is closest to:

A. weekly.

B. monthly.

C. quarterly.

Solution: B.

The effective annual return is: EAR = $(1 + \text{Periodic interest rate})^m$-1

For weekly compounding, $(1 + 0.10 / 52)^{52} - 1 = 0.10506 = 10.51\%$

For monthly compounding, $(1 + 0.10 / 12)^{12} - 1 = 0.10471 = 10.47\%$

For quarterly compounding, $(1 + 0.10 / 4)^4 - 1 = 0.10381 = 10.38\%$

Thus, the correct answer is monthly compounding.

Q-6. An investor buys a T-bill at 98,000 with 50 days to maturity. The par value of this T-bill is 100,000. The money market yield is closest to: （2012 年 12 月考题回顾）

A. 14.6%.

B. 14.7%.

C. 14.9%.

Solution: B.

Money market yield = [(par value – purchase price)/purchase price] * (360/50) = [(100,000 – 98,000)/98,000] * (360/50) = 14.69%

2.5. Time-Weighted Return and Money-Weighted Return

2.5.1. 重要知识点

2.5.1.1. **$1 + TWRR = (1+HPR_1) * (1+HPR_2) * \dots * (1+HPR_{365})$**, HPR_t is daily holding period return; **$1 + TWRR = [(1+r_1) * (1+r_2) * \dots * (1+r_N)]^{1/N}$**, r_i is the time-weighted return of year i.

2.5.1.2. **MWRR 概念：**The internal rate of return is called the money-weighted rate of return, in investment management applications, because it accounts for the timing and amount of all cash flows into and out of the portfolio.

- Only appropriate for the investment <u>when manager can control the timing and direction of CF</u>.

2.5.1.3. **MWRR 计算步骤及公式**

- Firstly, determine the timing of each cash flow;
- Then, using the calculator to compute IRR, or using geometric mean.

2.5.1.4. TWRR and MWRR:

- **TWRR:** Not be influenced by the timing and direction of CF, so it's an objective indicator of investment managers' performance;
  - 注意计算 time-weighted return 时，如果不是年度的 HPR 不用开方。
- **MWRR:** However, if can control the timing and direction, MWRR is the best indicator to measure the return.

2.5.2. 基础题

Q-7. Which of the following statements *most likely* represents a characteristic of the money-weighted rate of return?

A. It removes the effects of timing and amount of withdrawals and addition to the portfolio.

B. It reflects the compound rate of growth of one unit of currency invested over a stated measurement period.

C. It is the internal rate of return on a portfolio, taking account of all cash flows.

Solution: C.

The money-weighted rate of return is the IRR of an investment's net cash flows.

Q-8. An analyst gathers the following information about the performance of a portfolio ($ millions):

Quarter	Value at Beginning of Quarter	Cash Inflow (Outflow) at Beginning of Quarter	Value at End of Quarter
1	2.0	0.2	2.4
2	2.4	0.4	2.6
3	2.6	(0.2)	3.2
4	3.2	1.0	4.1

The portfolio's annual time-weighted rate of return is closest to:

A. 32%.

B. 27%.

C. 8%.

Solution: A.

The time-weighted rate of return is calculated by computing the quarterly holding period returns and linking those returns into an annual return as follows:

Quarter	Value ($ millions) at Beginning of Quarter (Considering Inflows and Outflows)	Value ($ millions) at End of Quarter	Holding Period Return
1	2.0 + 0.2 = 2.2	2.4	(2.4 – 2.2)/2.2 = 9.09%
2	2.4 + 0.4 = 2.8	2.6	(2.6 – 2.8)/2.8 = –7.14%
3	2.6 – 0.2 = 2.4	3.2	(3.2 – 2.4)/2.4 = 33.33%
4	3.2 + 1.0 = 4.2	4.1	(4.1 – 4.2)/4.2 = –2.38%

The time-weighted return (TWR) is found as follows:

$$TWR = (1+9.09\%)\times(1-7.14\%)\times(1+33.33\%)\times(1-2.38\%)-1 = 32\%(rounded)$$

Q-9. An analyst gathered the following information about a common stock investment:

	Date	Amount
Stock purchase (1)	15 January 2006	€86.00
Stock purchase (1)	15 January 2007	€94.00
Stock sale (2@106)	15 January 2008	€212.00

The stock does not pay a dividend. The money-weighted and time-weighted rates of return on the investment are *closest* to:

	Money-weighted rate of return	Time-weighted rate of return
A.	11.02%	8.53%
B.	11.02%	11.02%
C.	11.60%	11.02%

Solution: C.

Cash outflow of €86 occurs at t = 0, another outflow of €94 occurs at t = 1, and an inflow of €212 occurs at t = 2. Using a financial calculator, the IRR of these cash flows is 11.60%. The time-weighted rate of return is the geometric mean of the annual rates of return in the stock irrespective of the amounts invested in the various time periods. The rate of return for the first period is (94 - 86)/86 = 9.3023% and for the second period is (106 - 94)/94 = 12.7660%. The geometric mean is $(1.093023 \times 1.127660)^{0.5} - 1 = 11.02\%$.

2.6. Ratio, Ordinal, Interval, Nominal Scales

2.6.1. 重要知识点

2.6.1.1. Nominal, ordinal, interval, ratio scales

- **Nominal scales:** weakest level of measurement, categorize data but do not rank them, only has mode.
- **Ordinal scales:** stronger level of measurement, sort data into categories that are ordered with respect to some characteristics. Has mode and median.
- **Interval scales:** provide not only ranking but also assurance that the differences between scale values are equal, no absolute zero, can add and deduct.
- **Ratio scales:** the strongest level of measurement. Have absolute zero; can do all kinds of calculations.
- Notes: 一般 CFA 协会会给出具体场景，让考生判断属于哪种类型。

2.6.2. 基础题

Q-10. An analyst gathered the price-earnings ratios (P/E) for the firms in the S&P 500 and then ranked the firms from highest to lowest P/E. She then assigned the number 1 to the group with the lowest P/E ratios, the number 2 to the group with the second lowest P/E ratios, and so on. The measurement scale used by the analyst is *best* described as:

A. ratio.

B. ordinal.

C. interval.

Solution: B.

The analyst is using an ordinal scale which involves sorting data into categories based on some characteristic, such as the firms' P/E ratios.

2.7. Relative Frequencies and Cumulative Relative Frequencies

2.7.1. 重要知识点

2.7.1.1. Relative frequencies and cumulative relative frequencies:

- Relative frequency of observations in an interval is the number of observations (the absolute frequency) in the interval divided by the total number of observations.
- Cumulative relative frequency cumulates (adds up) the relative frequencies as we move from the first interval to the last.

2.7.2. 基础题

Q-11. An analyst gathered the following information about the price-earning (P/E) ratios for the common stocks held in a foundation's portfolio:

Interval	P/E range	Frequency

I	8.00-16.00	24
II	16.00-24.00	48
III	24.00-32.00	22
IV	32.00-40.00	16

The relative frequency and the cumulative relative frequency, respectively, for interval III are *closest* to:

	Relative frequency	Cumulative relative frequency
A.	20%	85%
B.	22%	36%
C.	22%	85%

Solution: A.

The relative frequency is the number of observations in an interval divided by the total number of observations. For Interval III, relative frequency = 22/110 = 20%. The cumulative relative frequency is the sum of the relative frequencies of the relevant class and all the classes before it. For Interval III, the cumulative relative frequency = (24 + 48 + 22)/110 = 85.45%.

2.8. Measures of Mean

2.8.1. 重要知识点

2.8.1.1. Measures of mean

- The arithmetic mean: $\overline{X} = \dfrac{\sum_{i=1}^{N} X_i}{n}$
- The weighted mean: $\overline{X_W} = \sum_{i=1}^{n} w_i X_i = (w_1 X_1 + w_2 X_2 + \cdots + w_n X_n)$
- The geometric mean: $G = \sqrt[N]{X_1 X_2 X_3 \ldots X_N} = (\prod_{i=1}^{N} X_i)^{1/N}$
- The harmonic mean: $\overline{X_H} = \dfrac{n}{\sum_{i=1}^{n} (1/X_i)}$
- Harmonic mean≤ geometric mean ≤ arithmetic mean

2.8.1.2. Performance measurement with means

- The geometric mean of past annual return is the appropriate measure of past performance.
- The arithmetic mean is the statistically best estimator of the next year's returns.