QF604 MCQ Practice Test 3

Please tick the most suitable answer to each multiple-choice question.

Q1. What is $X^2 + Y^2$ where $X \sim N(0,3)$ and $Y \sim N(0,3)$, and X, Y are independent?

(A) $2 \times [N(0,3)]^2$

(B) $2 \times \chi_2^2$

(C) $3 \times \chi_2^2$

(D) None of the above

Q2. Suppose we run an Ordinary Least Square regression of $Y_i = a + bX_i + e_i$ where e_i is a white noise that is independent of X_i. Given sample averages for Y and X are 30 and 10, respectively, and $\hat{b} = 2.80$, what is $\hat{a}$?

(A) 2.0

(B) 1.40

(C) 2.72

(D) Indeterminate from the given information.

Q3. For the general covariance-stationary processes such as ARMA(p, q) (p, q being any reasonably finite integers)

(A) conditional mean and conditional variance are constant at each t

(B) conditional mean and conditional variance change at each t

(C) conditional mean is constant and conditional variance changes at each t

(D) None of the above

Q4. Given that U_t, V_t, and W_t are all unit root processes, and we perform OLS regression of $W_t = a_0 + a_1 U_t + a_2 V_t + e_t$ where e_t is a disturbance that is independent of all the other variables, then

(A) the estimators of a_0, a_1, and a_2 will always be consistent

(B) the estimators of a_0, a_1, and a_2 will always be spurious

(C) it is not possible for all values of a_0, a_1, and a_2 to be non-zero

(D) None of the above.

Q5. Suppose we are testing if P_t is a unit root or $I(1)$ process, and we perform the following OLS regression $\Delta P_t = \delta + \theta P_{t-1} + e_t$, where e_t is a stationary random variable. Suppose the critical ADF statistic for this case at 1% significance level is -3.44, at 5% significance level is -2.86, and the computed $\hat{\theta} < 0$'s "t-statistic" is -2.965, then you

(A) reject null of unit root at 1%

(B) reject null of unit root at 5%

(C) cannot reject null of no unit root at 1%

(D) cannot reject null of no unit root at 5%

Q6. If stock prices are martingales, then

(A) the market is inefficient

(B) the market must always be efficient

(C) expected price changes are zeros

(D) prices are Markov processes

Q7. The predictability of long-run stock returns is due to

(A) serial correlation in dividend growth

(B) the availability of superior information

(C) behavioral finance anomaly

(D) positive alpha

Q8. Factor risk premia can be estimated by running

(A) Cross-sectional regression on the risk premia

(B) Cross-sectional regression on the risk factors

(C) Cross-sectional regression on factor loadings

(D) None of the above

Q9. A relevant variable was excluded in a mulitple linear regression. Which of the following is most reasonable?

(A) the estimated coefficients will always be biased

(B) the estimated coefficients will always be unbiased

(C) the estimated coefficient standard errors are typically larger

(D) the estimated coefficient standard errors are typically smaller

Q10. The Fama-MacBeth procedure has the advantage of smaller beta errors due to

(A) measuring the stock returns without errors

(B) repeated time series and cross-sectional regressions

(C) a panel regression approach

(D) forming portfolios of stocks with similar attributes

Q11. Suppose $U_t = c_0 + c_1 W_t + e_t, \quad t = 1, 2, \ldots, T$. W_t and zero mean e_t are stochastically independent, and e_i has different variances at diffent time, then weighted least squares can be

(A) BLUE

(B) biased but efficient

(C) biased but consistent

(D) unbiased but not efficient

Q12. Suppose $Y_t = c_0 + c_1 X_t + c_2 Z_t + e_t, \quad t = 1, 2, \ldots, T$ and e_t satisfies the classical conditions. However, in a regression, Z_t was omitted. If $Z_t = \rho Z_{t-1} + u_t$ where $\rho > 0$, and u_t is i.i.d., the D-W statistic in the above is likely to be

(A) less than 2

(B) about 2

(C) more than 2

(D) cannot be computed.

Q13. In a regression of 10-year future excess return on current dividend/price variable, the estimated slope coefficient of 0.3 is significantly different from null of zero at 5% significance level. In a separate regression, the 10-year future excess return is also significantly explained by size with an estimated coefficient of 0.25. Suppose another regression of 10-year future excess return is now performed on both these variables, the resulting estimated coefficients may now not be significant because of

(A) errors-in-variables

(B) wrong specification

(C) asymptotic errors

(D) multi-collinearity

Q14. In event study, the event day "-5" refers to

(A) a fixed calendar date 5 days before start of a month

(B) 5 days before the sampling period

(C) 5 days before announcement date of only one specific stock

(D) 5 days before announcement date of any stock with the same event

Q15. Suppose the unbiased expectations hypothesis is $F_{t,t+3} = E_t(S_{t+3})$. If we run a linear regression

$$S_{t+3} = \beta_0 + \beta_1 F_{t,t+3} + \beta_2 S_t + \beta_3 F_{t,t+2} + e_{t+3}$$

where e_{t+3} is independent residual error, which of the following hypothesis is most appropriate?

(A) $H_0 : \beta_1 = 1$

(B) $H_0 : \beta_0 = \beta_1 = 0$

(C) $H_0 : \beta_0 = 0;\ \beta_1 = 1$

(D) $H_0 : \beta_0 = \beta_2 = \beta_3 = 0;\ \beta_1 = 1$

Q16. An MA(q) process, where q is finite, can be represented as an infinite convergent AR process provided

(A) it is stationary

(B) it is invertible

(C) it does not have unit roots

(D) it is also autoregressive

Q17. In a GARCH model where return is $r_t = \mu + h_t^{\frac{1}{2}} e_t$, e_t is i.i.d. distributed as $N(0,1)$, and conditional variance of r_t is $h_t = \beta_0 + \beta_1 h_{t-1} + \beta_2 e_{t-1}^2$, which of the following statements is most accurate?

(A) r_t is unconditionally normally distributed

(B) r_t is non-stationary

(C) the GARCH model can forecast future variance of r_t

(D) the GARCH model cannot forecast future mean of r_t

Q18. The errors-in-variables problem in estimating beta on the CAPM can be reduced or mitigated by

(A) Fama-MacBeth's grouping procedure

(B) White's HCCME

(C) Correction for measurement errors

(D) None of the above

Q19. Suppose a first linear regression is $Y_{1t} = a_0 + a_1 X_t + e_t$ for $t = 1, 2, \ldots, T$, and the vector of residual errors has $T \times T$ covariance matrix Σ. Suppose a second linear regression is $Y_{2t} = a_0 + a_1 Z_t + v_t$ for $t = 1, 2, \ldots, T$, and the vector of residual errors has $T \times T$ covariance matrix Σ. e_t and v_t are independent. If we form dependent variable vector $M_{2T\times 1} = (Y_{11}, \ldots, Y_{1T}, Y_{21}, \ldots, Y_{2T})^T$, and explanatory variable matrix

$$S_{2T\times 2} = \begin{pmatrix} 1 & 1 & \ldots & 1 & 1 & 1 & \ldots & 1 \\ X_1 & X_2 & \ldots & X_T & Z_1 & Z_2 & \ldots & Z_T \end{pmatrix}^T$$

to run the linear regression, would the GLS estimates of a_0, a_1 be different from the GLS estimates if we run the first and the second regressions separately?

(A) The combined regression is more efficient due to larger sample

(B) The combined regression is more efficient because of GLS

(C) The combined regression is less efficient because of pooled noise

(D) The combined regression is less efficient because of inversion error

Q20. In a linear regression model $Y = XB + e$, $Y_{N\times 1}$ takes only binary values of 1 or 0, X is a $N \times 3$ explanatory variable matrix where the first column contains all ones, and e is a N vector of zero mean i.i.d. residual errors. e is non-normal. Let the i^{th} row of X be X_i. Suppose $E(Y_i|X_i) = \frac{e^{X_i B}}{1+e^{X_i B}}$ using logistic regression. If the estimates of B are $(0.5, 0.05, 0.1)$, what is the estimated probability of $Y = 1$ when $X_i = (1, 2, 1)$?

(A) 0.47

(B) 0.57

(C) 0.67

(D) None of the above.

Ans: Q1 (C), Q2 (A), Q3 (D), Q4 (D), Q5 (B), Q6 (C), Q7 (A), Q8 (C), Q9 (C), Q10 (D)
Q11 (A), Q12 (A), Q13 (D), Q14 (D), Q15 (D), Q16 (B), Q17 (C), Q18 (A), Q19 (B), Q20 (C)