QF604 MCQ Practice Test 4

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

Q1. What is $X^2 + Y^2 + Z^2$ where X, Y, Z are independently distributed as $N(0, 2)$?

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

(B) $2 \times \chi^2_3$

(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 300 and 250, respectively, and $\hat{b} = 1.0$, what is $\hat{a}$?

(A) 1.20

(B) 1.19

(C) 50.0

(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 changes and conditional variance is constant at each t

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

Q4. If a stochastic trend exists in a price process Z_t with i.i.d. increments, then this is <u>not</u> likely to show up as

(A) mean reversion

(B) a possibly changing conditional mean term

(C) a decreasing variance as time decreases

(D) a correlogram (graph of correlation function against time lags) that decays very slowly.

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 -3.965, then you

(A) reject null of unit root at 1%

(B) cannot reject null of unit root at 1%

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

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

Q6. If $Q_t = e^{-rt} P_t$, and Q_t follows a martingale, then

(A) $E_t(P_{t+1}) = P_t$

(B) $E_t(P_{t+1}) = e^r P_t$

(C) $E_t(P_{t+1}) = e^{rt} P_t$

(D) $E_t(P_{t+1}) = e^{r(t+1)} P_t$

Q7. The reason why stock returns may be predictable is associated with

(A) daily time trend of the stock return

(B) long-term stock return autocorrelations

(C) weekly stock price variations

(D) momentum of stock movements

Q8. A stock beta is obtained by running

(A) Cross-sectional regression

(B) Time series regression

(C) Cross-sectional regression with constraint on loadings

(D) Time series regression with constraint on residual error

Q9. An irrelevant variable was included 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 biased downward

(C) the estimated coefficient standard errors are typically larger

(D) the estimated coefficient standard errors are typically smaller

Q10. In multi-factor models on stock pricing when only risk factors are identified, the Fama-McBeth procedure is

(A) First running cross-sectional regressions, then running time series regressions

(B) First running cross-sectional regression, then repeat after sorting

(C) First running time series regressions, then running cross-sectional regressions

(D) First sorting, then running cross-sectional regressions

Q11. Suppose $Y_i = c_0 + c_1 X_i + e_i, \quad i = 1, 2, \ldots, N$. X_i and zero mean e_i are stochastically independent, and e_i is heteroskedastic, then the OLS estimator is

(A) BLUE

(B) biased but consistent

(C) unbiased but not efficient

(D) None of the above

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 future excess return on current dividend/price variable, suppose the errors or disturbances are not contemporaneously correlated with dividend yields, but are serially correlated, then the OLS estimates will be

(A) unbiased but inconsistent

(B) unbiased and consistent

(C) biased and consistent

(D) wrong because of wrong t-statistic.

Q14. If null hypothesis is that abnormal return $AR_{it} \sim N(0, \sigma^2)$, what is the null of the distribution of cumulative abnormal return at the end of a window of 5 days?

(A) $\frac{1}{5} N(0, \sigma^2)$

(B) $\sqrt{5} N(0, \sigma^2)$

(C) $5N(0, \sigma^2)$

(D) $N(0, \sigma^2)$

Q15. There are typically many specifications that are consistent with the unbiased expectations hypothesis. The following is one.

$$S_t = c_0 + c_1 F_{t-k,t} + e_t, \; k > 0$$

What restrictions on the regression coefficients and disturbance are implied by the UEH?

(A) $c_0 \times c_1 = 0, E(e_t \,|\, F_{t-k,t}) = 0$

(B) $c_0 \times c_1 = 0, E(e_t \,|\, F_{t-k,t}) \neq 0$

(C) $c_0 = 0, c_1 = 1, E(e_t \,|\, F_{t-k,t}) \neq 0$

(D) $c_0 = 0, c_1 = 1, E(e_t \,|\, F_{t-k,t}) = 0$

Q16. An ARMA(p,q) process, where p, q are 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 $r_t = h_t^{\frac{1}{2}} e_t$, e_t is i.i.d. distributed as $N(0,1)$, and conditional variance of e_t is $h_t = \beta_0 + \beta_1 r_{t-1}^2 + \beta_2 h_{t-1} e_{t-1}^2$, what is the most plausible set of estimates?

(A) $\beta_0 = 0.03$, $\beta_1 = 0.7$, $\beta_2 = -0.1$

(B) $\beta_0 = -0.03$, $\beta_1 = 0.7$, $\beta_2 = -0.1$

(C) $\beta_0 = 0.03$, $\beta_1 = 0.4$, $\beta_2 = 0.7$

(D) $\beta_0 = -0.03$, $\beta_1 = 0.4$, $\beta_2 = 0.7$

Q18. Which technique can you use to address the endogeneity bias problem in a linear regression?

(A) Fama-MacBeth's grouping procedure

(B) White's HCCME

(C) Instrumental variable method

(D) generalized least squares

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_e. Suppose a second linear regression is $Y_{2t} = b_0 + a_1 Z_t + v_t$ for $t = 1, 2, \ldots, T$, and the vector of residual errors has $T \times T$ covariance matrix Σ_v. e_t and v_t are independent. If instead 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 such that $M = SB + E$ where B is vector of coefficients from the two regressions to be estimated, and

$$\text{cov}(E) = \begin{pmatrix} \Sigma_e & 0 \\ 0 & \Sigma_v \end{pmatrix}_{2T\times 2T},$$

what is the dimension of matrix S?

(A) $2T \times 2$

(B) $2T \times 3$

(C) $2T \times 4$

(D) None of the above

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 $E(Y_i|X_i) = \frac{1}{1+e^{-X_i B}}$ using logistic regression. If the estimates of B are $(0.1, 0.1, 0.1)$, what is the estimated probability of $Y = 1$ when $X_i = (1, 2, 3)$?

(A) 0.62

(B) 0.65

(C) 0.68

(D) None of the above

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