LEVEL II SCHWESER'S QuickSheet

Critical Concepts for the 2017 CFA® Exam

ETHICAL AND PROFESSIONAL STANDARDS

I		**Professionalism**
I	(A)	Knowledge of the Law
I	(B)	Independence and Objectivity
I	(C)	Misrepresentation
I	(D)	Misconduct
II		**Integrity of Capital Markets**
II	(A)	Material Nonpublic Information
II	(B)	Market Manipulation
III		**Duties to Clients**
III	(A)	Loyalty, Prudence, and Care
III	(B)	Fair Dealing
III	(C)	Suitability
III	(D)	Performance Presentation
III	(E)	Preservation of Confidentiality
IV		**Duties to Employers**
IV	(A)	Loyalty
IV	(B)	Additional Compensation Arrangements
IV	(C)	Responsibilities of Supervisors
V		**Investment Analysis, Recommendations, and Action**
V	(A)	Diligence and Reasonable Basis
V	(B)	Communication with Clients and Prospective Clients
V	(C)	Record Retention
VI		**Conflicts of Interest**
VI	(A)	Disclosure of Conflicts
VI	(B)	Priority of Transactions
VI	(C)	Referral Fees
VII		**Responsibilities as a CFA Institute Member or CFA Candidate**
VII	(A)	Conduct in the CFA Program
VII	(B)	Reference to CFA Institute, CFA Designation, and CFA Program

QUANTITATIVE METHODS

Simple Linear Regression

Correlation:

$$r_{XY} = \frac{cov_{XY}}{(s_X)(s_Y)}$$

t-test for r (n – 2 df): $t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$

Estimated slope coefficient: $\frac{cov_{xy}}{\sigma_x^2}$

Estimated intercept: $\hat{b}_0 = \bar{Y} - \hat{b}_1\bar{X}$

Confidence interval for predicted Y-value:

$\hat{Y} \pm t_c \times SE$ of forecast

Multiple Regression

$$Y_i = b_0 + (b_1 \times X_{1i}) + (b_2 \times X_{2i}) + (b_3 \times X_{3i}) + \varepsilon_i$$

- Test statistical significance of b; H_0: b = 0.

  $t = \hat{b} / s_{\hat{b}}$, n – k – 1 df

- Reject if |t| > critical t or p-value < α.
- Confidence Interval: $\hat{b}_j \pm (t_c \times s_{\hat{b}_j})$.
- SST = RSS + SSE.
- MSR = RSS / k.
- MSE = SSE / (n – k – 1).
- Test statistical significance of regression: F = MSR / MSE with k and n – k – 1 df (1-tail).
- Standard error of estimate (SEE = $\sqrt{MSE}$). Smaller SEE means better fit.
- Coefficient of determination (R^2 = RSS / SST). % of variability of Y explained by Xs; higher R^2 means better fit.

Regression Analysis—Problems

- Heteroskedasticity. Non-constant error variance. Detect with Breusch-Pagan test. Correct with White-corrected standard errors.
- Autocorrelation. Correlation among error terms. Detect with Durbin-Watson test; positive autocorrelation if DW < d_l. Correct by adjusting standard errors using Hansen method.
- Multicollinearity. High correlation among Xs. Detect if F-test significant, t-tests insignificant. Correct by dropping X variables.

Model Misspecification

- Omitting a variable.
- Variable should be transformed.
- Incorrectly pooling data.
- Using lagged dependent vbl. as independent vbl.
- Forecasting the past.
- Measuring independent variables with error.

Effects of Misspecification

Regression coefficients are biased and inconsistent, lack of confidence in hypothesis tests of the coefficients or in the model predictions.

Linear trend model: $y_t = b_0 + b_1 t + \varepsilon_t$

Log-linear trend model: $\ln(y_t) = b_0 + b_1 t + \varepsilon_t$

Covariance stationary: mean and variance don't change over time. To determine if a time series is covariance stationary, (1) plot data, (2) run an AR model and test correlations, and/or (3) perform Dickey Fuller test.

Unit root: coefficient on lagged dep. vbl. = 1. Series with unit root is not covariance stationary. First differencing will often eliminate the unit root.

Autoregressive (AR) model: specified correctly if autocorrelation of residuals not significant.

Mean reverting level for AR(1):

$$\frac{b_0}{(1-b_1)}$$

RMSE: square root of average squared error.

Random Walk Time Series:

$$x_t = x_{t-1} + \varepsilon_t$$

Seasonality: indicated by statistically significant lagged err. term. Correct by adding lagged term.

ARCH: detected by estimating:

$$\hat{\varepsilon}_t^2 = a_0 + a_1\hat{\varepsilon}_{t-1}^2 + \mu_t$$

Variance of ARCH series:

$$\hat{\sigma}_{t+1}^2 = \hat{a}_0 + \hat{a}_1\hat{\varepsilon}_t^2$$

Risk Types:

Appropriate method	*Distribution of risk*	*Sequential?*	*Accommodates Correlated Variables?*
Simulations	Continuous	Does not matter	Yes
Scenario analysis	Discrete	No	Yes
Decision trees	Discrete	Yes	No

ECONOMICS

bid-ask spread = ask quote – bid quote

Cross rates with bid-ask spreads:

$$\left(\frac{A}{C}\right)_{bid} = \left(\frac{A}{B}\right)_{bid} \times \left(\frac{B}{C}\right)_{bid}$$

$$\left(\frac{A}{C}\right)_{offer} = \left(\frac{A}{B}\right)_{offer} \times \left(\frac{B}{C}\right)_{offer}$$

Currency arbitrage: "Up the bid and down the ask."

Forward premium = (forward price) – (spot price)

Value of fwd currency contract prior to expiration:

$$V_t = \frac{(FP_t - FP)(\text{contract size})}{\left[1 + R_A\left(\frac{days}{360}\right)\right]}$$

Covered interest rate parity:

$$F = \frac{\left[1 + R_A\left(\frac{days}{360}\right)\right]}{\left[1 + R_B\left(\frac{days}{360}\right)\right]} S_0$$

Uncovered interest rate parity:

$E(\%\Delta S)_{(A/B)} = R_A - R_B$

Fisher relation:

$R_{nominal} = R_{real} + E(inflation)$

International Fisher Relation:

$R_{nominal\ A} - R_{nominal\ B} = E(inflation_A) - E(inflation_B)$

Relative Purchasing Power Parity: High inflation rates leads to currency depreciation.

$\%\Delta S(A/B) = inflation_{(A)} - inflation_{(B)}$

where: %ΔS(A/B) = change in spot price (A/B)

real exchange rate $= S_t\left[\frac{CPI_B}{CPI_A}\right]$

Taylor Rule: Prescribed central bank policy rate

$= r_n + \pi + \alpha(\pi - \pi^*) + \beta(y - y^*)$

= (neutral real policy rate) + (current inflation rate)

+ α(current inflation rate – target inflation rate)

+ β(log of the current level of output – log of the potential level of output)

Profit on FX Carry Trade = interest differential – change in the spot rate of investment currency.

Mundell-Fleming model: Impact of monetary and fiscal policies on interest rates & exchange rates. Under high capital mobility, expansionary monetary policy/restrictive fiscal policy → low interest rates → currency depreciation. Under low capital mobility, expansionary monetary policy/expansionary fiscal policy → current account deficits → currency depreciation.

Dornbusch overshooting model: Restrictive monetary policy → short-term appreciation of currency, then slow depreciation to PPP value.

Labor Productivity:

output per worker $Y/L = T(K/L)^{\alpha}$

Growth Accounting:

growth rate in potential GDP

= long-term growth rate of technology

+ α (long-term growth rate of capital)

+ (1 – α) (long-term growth rate of labor)

growth rate in potential GDP

= long-term growth rate of labor force

+ long-term growth rate in labor productivity

Classical Growth Theory

- Real GDP/person reverts to subsistence level.