QUANTITATIVE ANALYSIS

- Regression coefficient: b0 and b1 (b0: intercept, b1: slope coefficient)
- If we don't know the population variance of b1 and b2 -> use t-test instead of z-test
- In predicting dependent variable using linear regression, there are two uncertainties: uncertainty in the regression model itself (standard error of estimate) and uncertainty about the estimates of regression model's parameter
- Multiple regression assumes that independent variables are not random
- If we use adjusted R2 to compare regression model: the dependent variable must be defined the same way and the sample size is the same
- **Unconditional heteroskedasticity:** error variance is not correlated with independent variables -> creates no major problem for statistical inference
- **Conditional heteroskedasticity:** error variance is correlated with independent variables -> results in consistent parameter estimates but standard error for t-statistics and F-statistics will be biased
- Positive serial correlation -> positive (negative) error for one observation increases the chance of a positive (negative) error for another observation
- Negative serial correlation: a positive error for one observation increases the chance of a negative error for another observation
- Serial correlation does not affect the consistency of the estimated regression coefficient but it affects the standard error (underestimate it)

Exhibit 16 Problems in Linear Regression and Their Solutions

Problem	Effect	Solution
Heteroskedasticity	Incorrect standard errors	Use robust standard errors (corrected for conditional heteroskedasticity)
Serial correlation	Incorrect standard errors (additional problems if a lagged value of the dependent variable is used as an independent variable)	Use robust standard errors (corrected for serial correlation)
Multicollinearity	High R^2 and low t-statistics	Remove one or more independent variables; often no solution based in theory

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- Logistic transformation for qualitative (categorical) dependent variable : logistic distribution (logit probit model) or probit model (based on normal distribution) or discriminant analysis
    - p / (1-p)) -> odds of an event happening; p = probability that the company goes bankrupt (an event happens); -> 3: prob of bankruptcy is 3x prob of company not going bankrupt
    - slope coefficient: the change in the log odds that the event happens per unit change in the independent variable holding all other independent variable constant
    - Log odds of CEO winning an award based on estimated regression model: - 2.3085; slope coefficient of independent variable female: 0.81; log odds of the CEO winning an award if the CEO was a female = -2.3085 + 0.81 = -1.4985
    - Odds of CEO winning an award: e(-2.3085)
    - Ratio of odds of female CEO wins an awards to the odds of male CEO wins an award: e(0.81) = 2.2479
- Log linear model: 1) for exponential growth rate (compound growth rate with continuous compounding) 2) constant growth rate

Exhibit 8 Noncash Items and FCFF

Noncash Item	Adjustment to NI to Arrive at FCFF
Depreciation	Added back
Amortization and impairment of intangibles	Added back
Restructuring charges (expense)	Added back
Restructuring charges (income resulting from reversal)	Subtracted
Losses	Added back
Gains	Subtracted
Amortization of long-term bond discounts	Added back
Amortization of long-term bond premiums	Subtracted
Deferred taxes	Added back but calls for special attention

- Dividend imputation tax system = ensures that corporate profits distributed as dividends are just taxed just once at the shareholder's tax rate
- Split-rate tax system = corporate profits distributed as dividends are taxed at a lower rate than the ones retained in the business

EQUITY INVESTMENT

- If stock is fairly valued, total return = required return; total return = dividend yield + capital gain; in the case of Gordon Growth Model, capital gain = constant growth rate
- Normalized EPS
  - Level of EPS that the business expected to achieve under mid-cyclical conditions
  - Method of historical average EPS of the most recent full cycle
  - Method of average ROE -> average ROE from the most recent full cycle is multiplied by current BPVS
- Momentum Valuation Indicators
  - Scaled earnings surprise = unexpected earnings / st. dev of analyst's earnings forecast
  - Standardized unexpected earnings (SUE) = (actual EPS – expected EPS) / st.dev of unexpected EPS over some historical period
  - Relative Strength Indicator = compare stock's performance to its own historical performance or with the performance of some group of stocks

FIXED INCOME

- For zero coupon bonds, effective duration is the same as its maturity
- Effective duration of portfolio (3 bonds with maturity 1,5,10 years) = 1/3 * (1+5+10) = 5.333
- Economic expansion -> monetary authorities raise benchmark rates to control inflation -> **bearish flattening** -> short-term bond yields rise more than long-term bond yields resulting in a flatter yield curve
- Economic recession -> monetary authorities cut benchmark rates to stimulate economic activities -> **bullish steepening** -> short-term bond yield fall more than long-term yield -> steeper term structure

Special situations	Mezzanine finance	Financing generally provided in the form of subordinated debt and an equity kicker (warrants, equity, etc.) frequently in the context of LBO transactions
	Distressed/turnaround	Financing of companies in need of restructuring or facing financial distress
	One-time opportunities	Financing in relation to changing industry trends and new government regulations
	Other	Other forms of private equity financing are also possible—for example, activist investing, funds of funds, and secondaries.

- Valuation techniques:
  - Seed and start-up companies: real options, replacement cost
  - For more mature companies: DCF and price multiples
- Rachet: a contractual term enabling management of private equity-controlled company to rewarded with an increase in equity stake as a result of meeting a performance target
- Private equity return
  - The IRR of private equity return is cashflow-weighted while the performance of most other asset class is measured in terms of time-weighted rate of return
  - Distribution waterfall according to total return method (European) -> GP receives carried interest only after the fund has returned the entire committed capital to LPs /// others: carried interest is distributed if NAV before distribution exceeds committed capital -> carried interest is calculated as = carried interest rate (NAV before distribution t – NAV bfr distribution t-1)
  - Distribution waterfall (American) -> deal by deal basis
  - Management fees are calculated on the basis of paid-in capital
  - Paid-in capital -> cumulative capital called down
  - RVPI = (total capital called down + total operating result – total fee & carried interest – total distribution) / total capital called down
  - Ngeliat hurdle rate tercapai atau engga dari gross IRR
    - -100 + 6 + 112 = 8.87% > 7% hurdle rate
    - Limited partners return = (6+12) – (2% management fee * 100 paid in capital * 2 years) – ((6+12-2 management fee)*17% carried interest) = 11.62
- Theories of future returns
  - Insurance theory (normal backwardation) -> producers of commodity will prefer to accept a discount on the potential future spot price in return for the certainty of knowing the future selling price in advance
  - Hedging pressure hypothesis: producers and consumers seek to protect themselves from commodity market price volatility
  - Theory of storage

PORTFOLIO MANAGEMENT

- Authorized participants (AP)
  - A special group of institutional investors who are authorized by ETF issuers to participate in the creation / redemption process; usually large broker/dealers/market maker
  - Creation: AP transfer securities to ETF issuer in exchange of ETF shares
  - Redemption: AP receive securities from ETF issuers in exchange of ETF shares
- Significant ETF cost
  - Short-term investors: commission, bid-ask spread, premium/discount
  - Long-term investors: management fee, tracking error, others