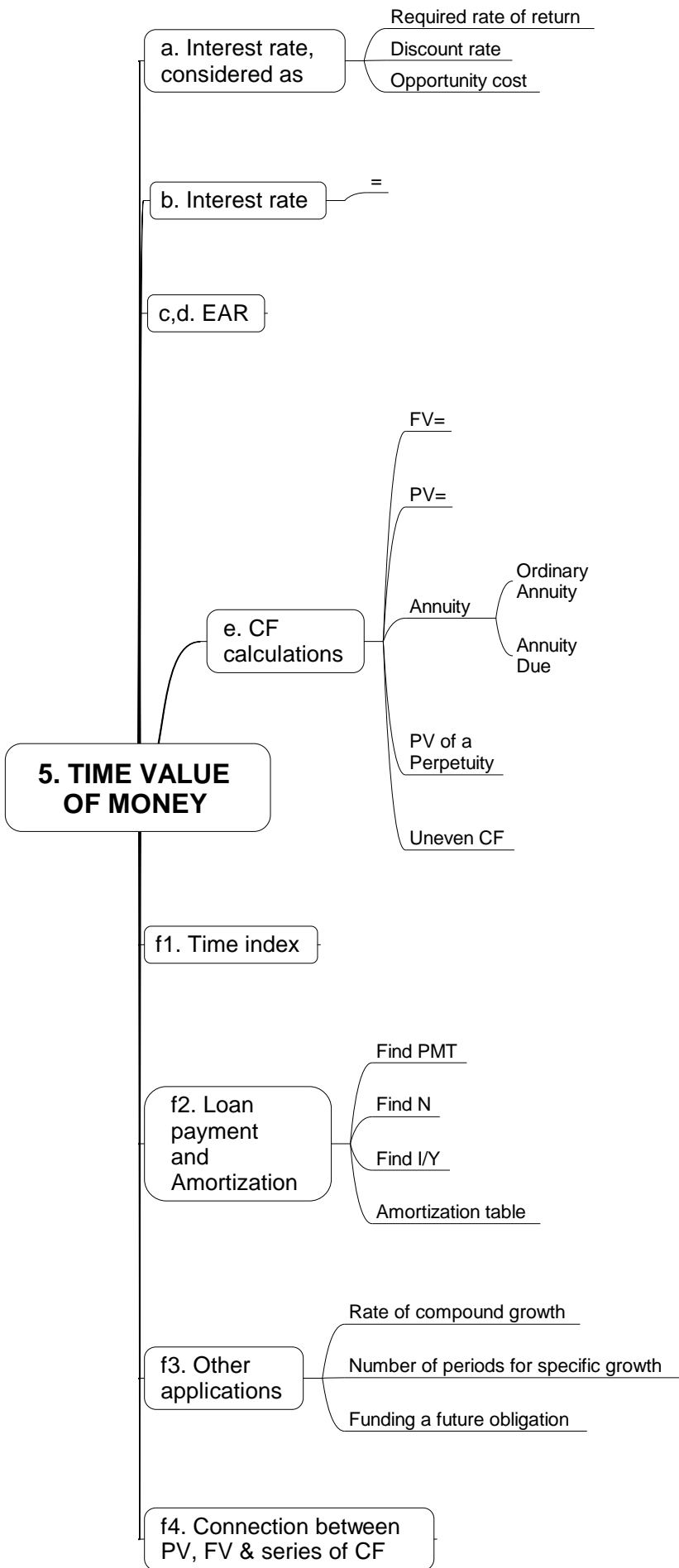


CFA LEVEL 1

STUDY SESSION 02&03

**QUANTITATIVE  
ANALYSIS**



# 6. DISCOUNTED CASH FLOW APPLICATIONS

a,b. Calculate, Interpret, Decision rule

- NPV
- IRR
  - Problems
  - Conflict with NPV due to
    - # Initial costs
    - # timing

c. HPR

d. Portfolio rate of return

- Money Weighted
  - IRR
  - More appropriate if manager has complete control over cash in/out
- Time weighted
  - Compound growth
  - Geometric mean
  - Not affected by cash in/out
  - Preferred method

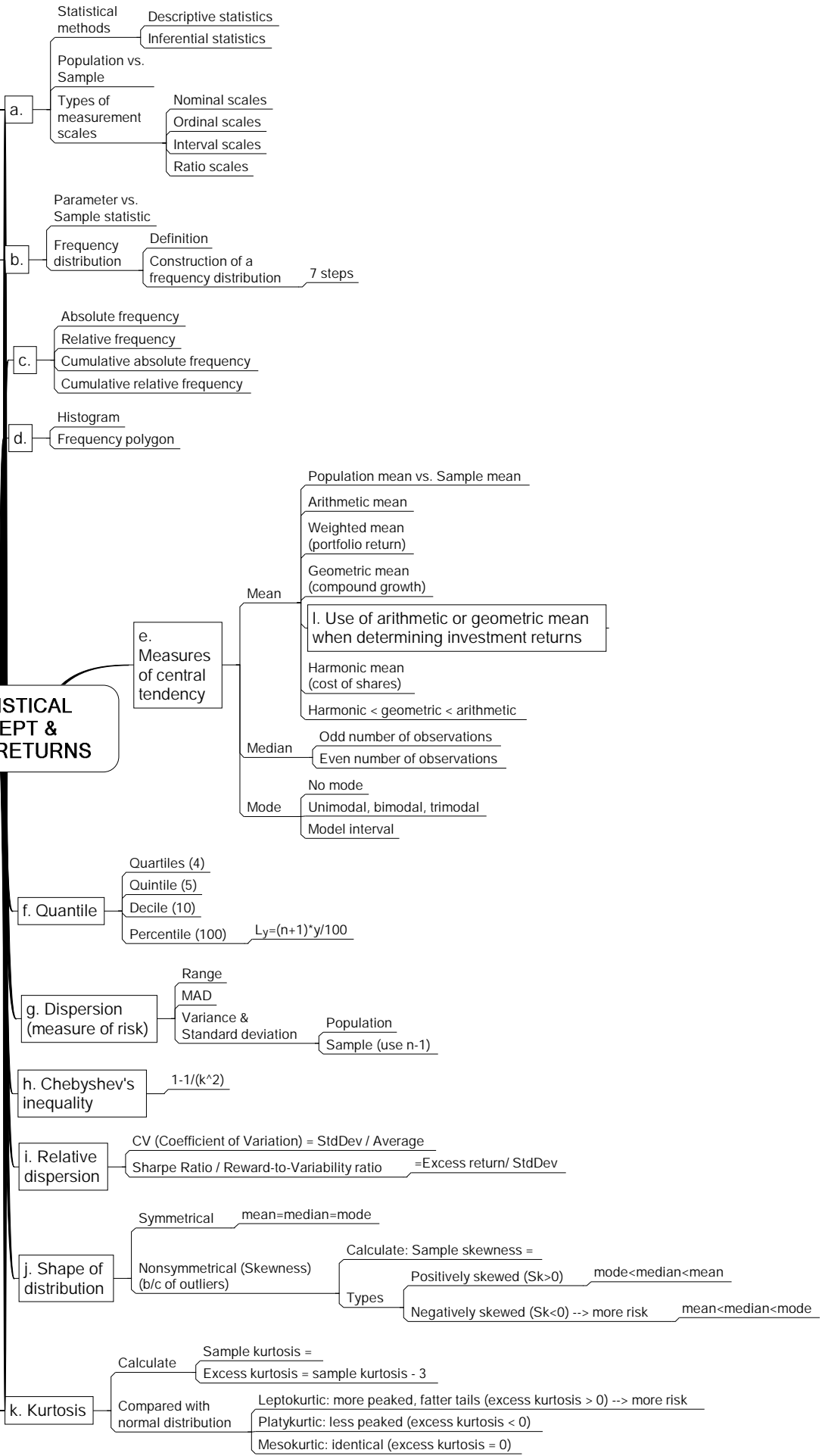
e. Yields of T-bills

- Bank discount yield
- Holding period yield
- Effective annual yield
- Money market yield

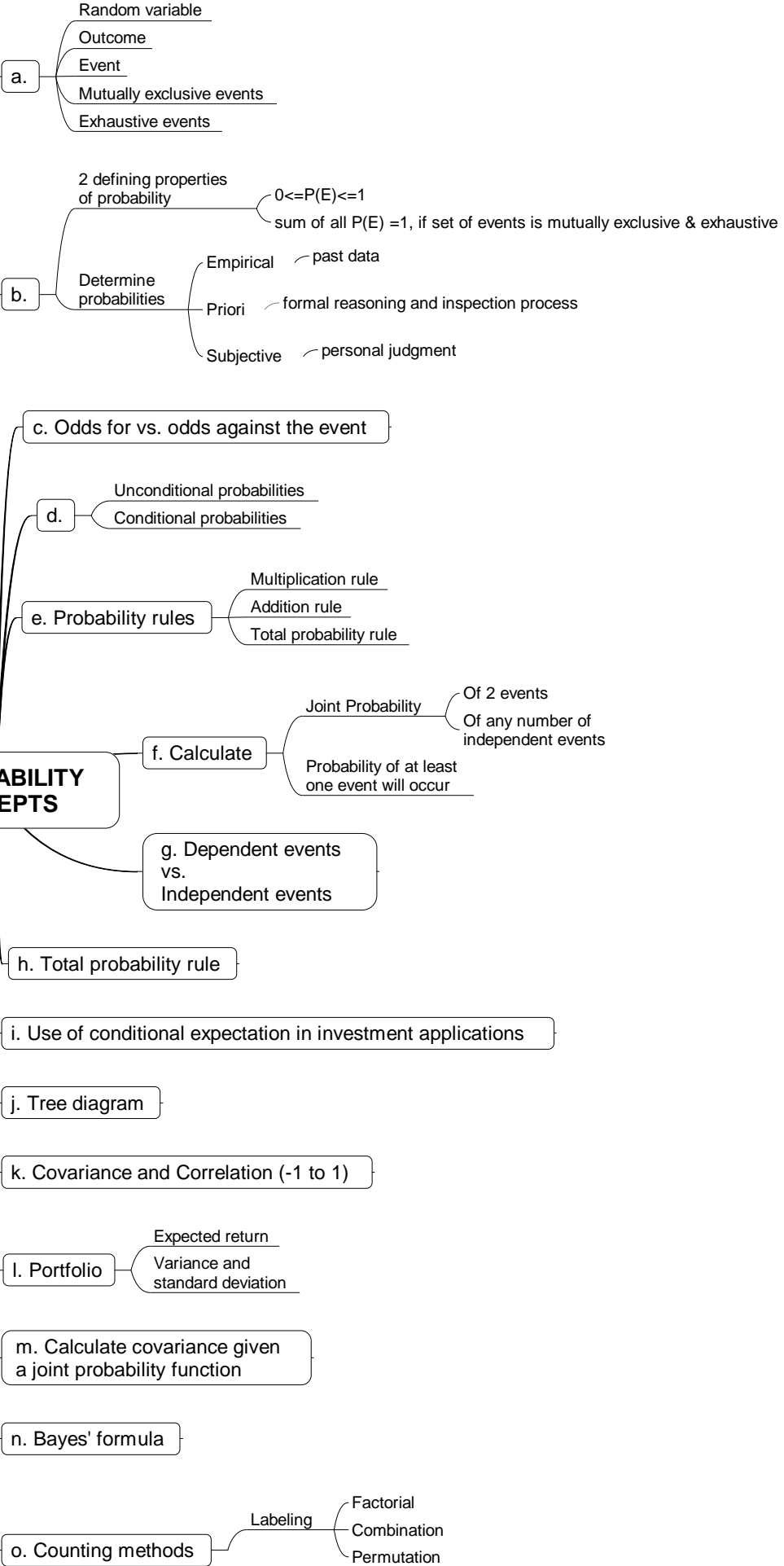
f1. Convert among these yields

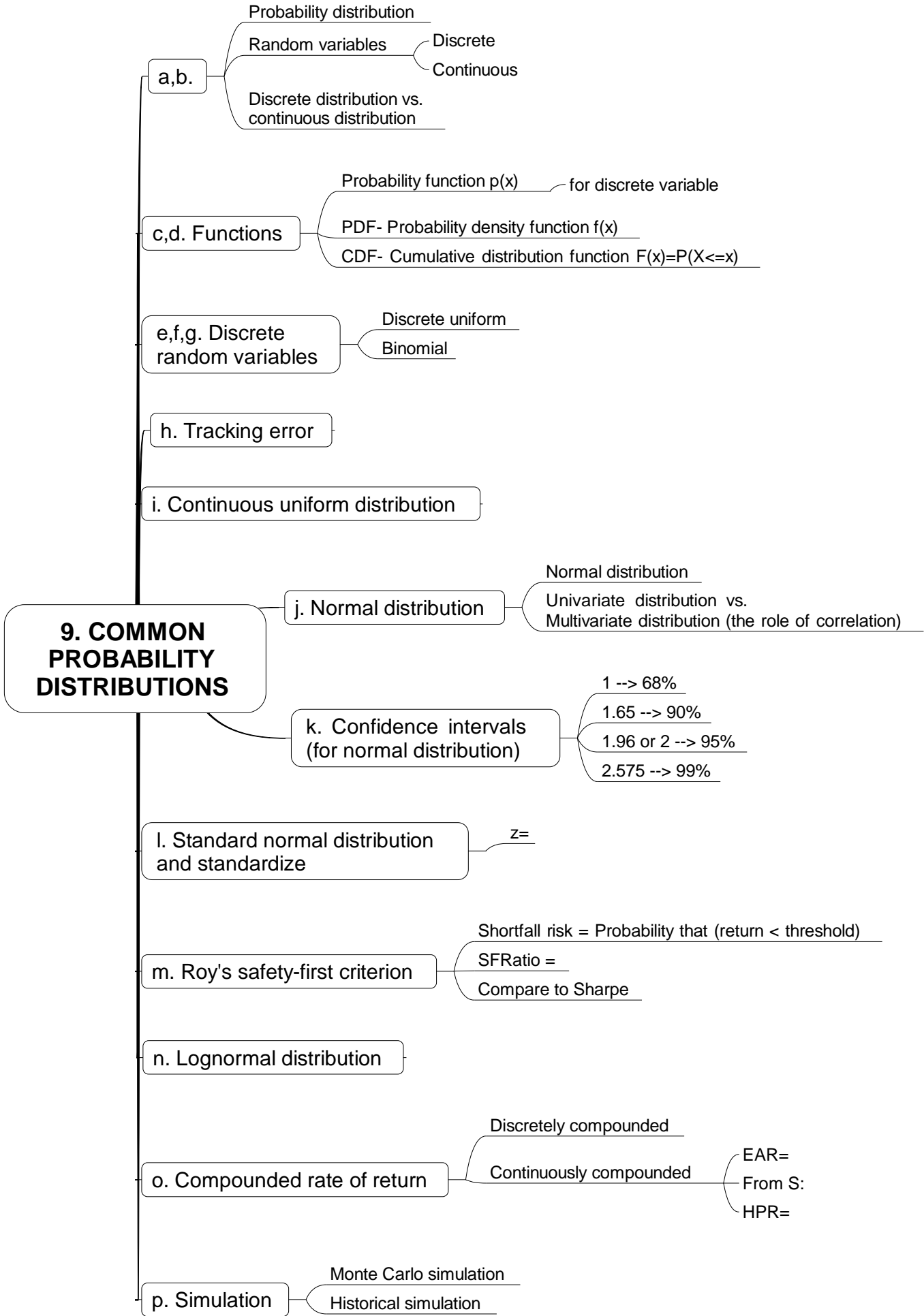
f2. Bond equivalent yield

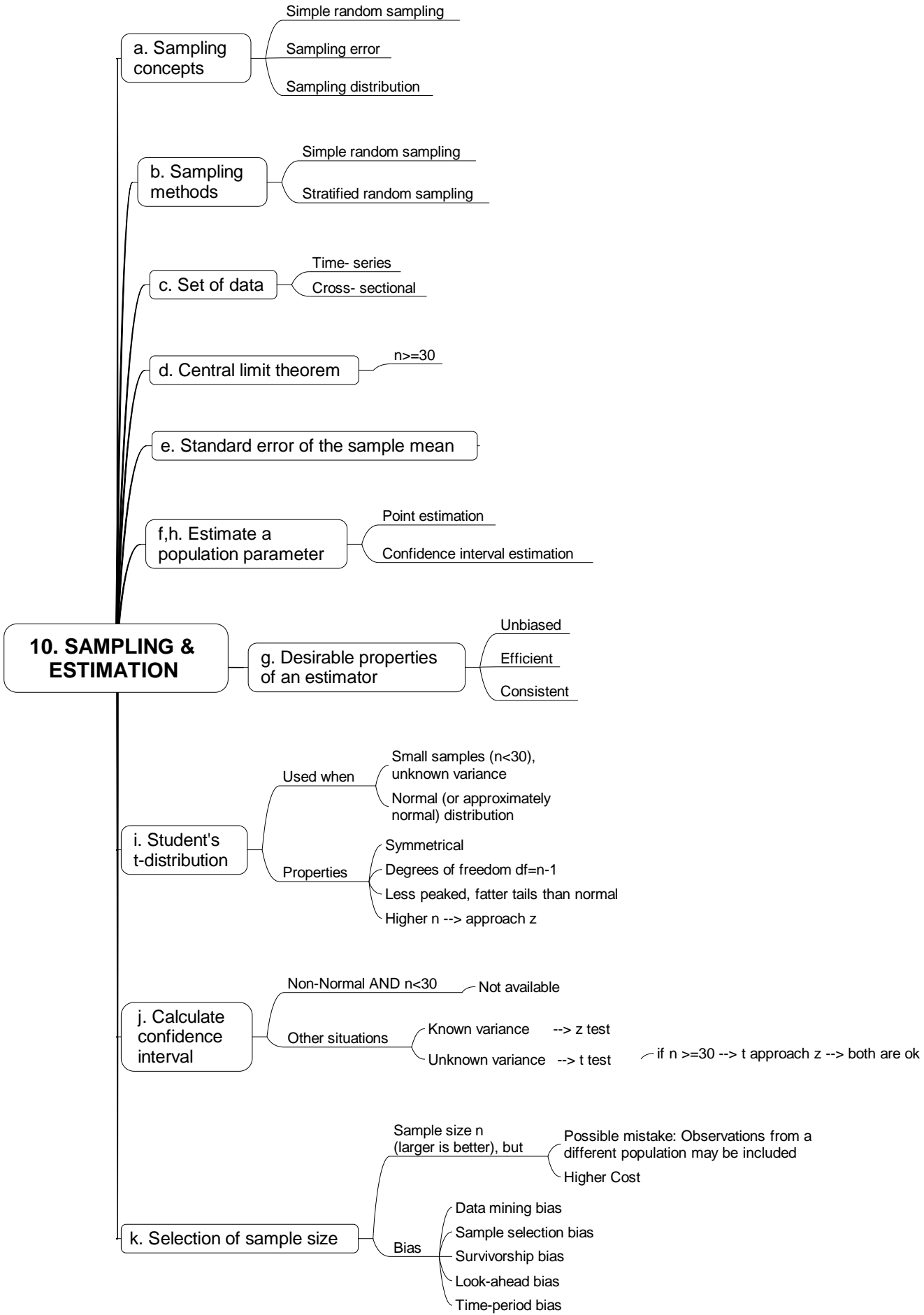
# 7. STATISTICAL CONCEPT & MARKET RETURNS



# 8. PROBABILITY CONCEPTS







**10. SAMPLING & ESTIMATION**

a. Sampling concepts

- Simple random sampling
- Sampling error
- Sampling distribution

b. Sampling methods

- Simple random sampling
- Stratified random sampling

c. Set of data

- Time-series
- Cross-sectional

d. Central limit theorem

$n \geq 30$

e. Standard error of the sample mean

f,h. Estimate a population parameter

- Point estimation
- Confidence interval estimation

g. Desirable properties of an estimator

- Unbiased
- Efficient
- Consistent

i. Student's t-distribution

Used when

- Small samples ( $n < 30$ ), unknown variance
- Normal (or approximately normal) distribution

Properties

- Symmetrical
- Degrees of freedom  $df = n - 1$
- Less peaked, fatter tails than normal
- Higher  $n \rightarrow$  approach  $z$

j. Calculate confidence interval

Non-Normal AND  $n < 30$

Not available

Other situations

- Known variance  $\rightarrow$  z test
- Unknown variance  $\rightarrow$  t test

if  $n \geq 30 \rightarrow$  t approach z  $\rightarrow$  both are ok

k. Selection of sample size

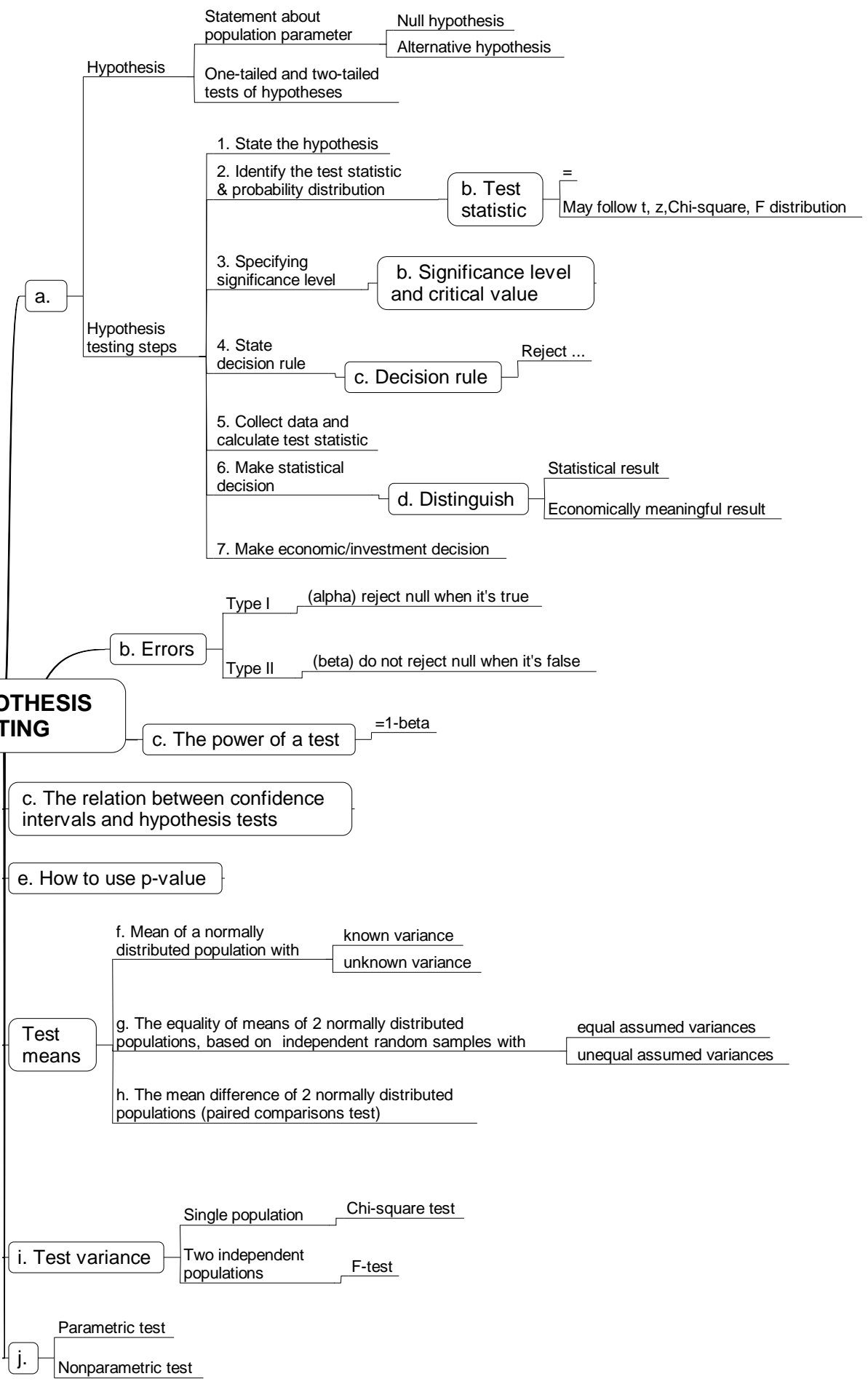
Sample size  $n$  (larger is better), but

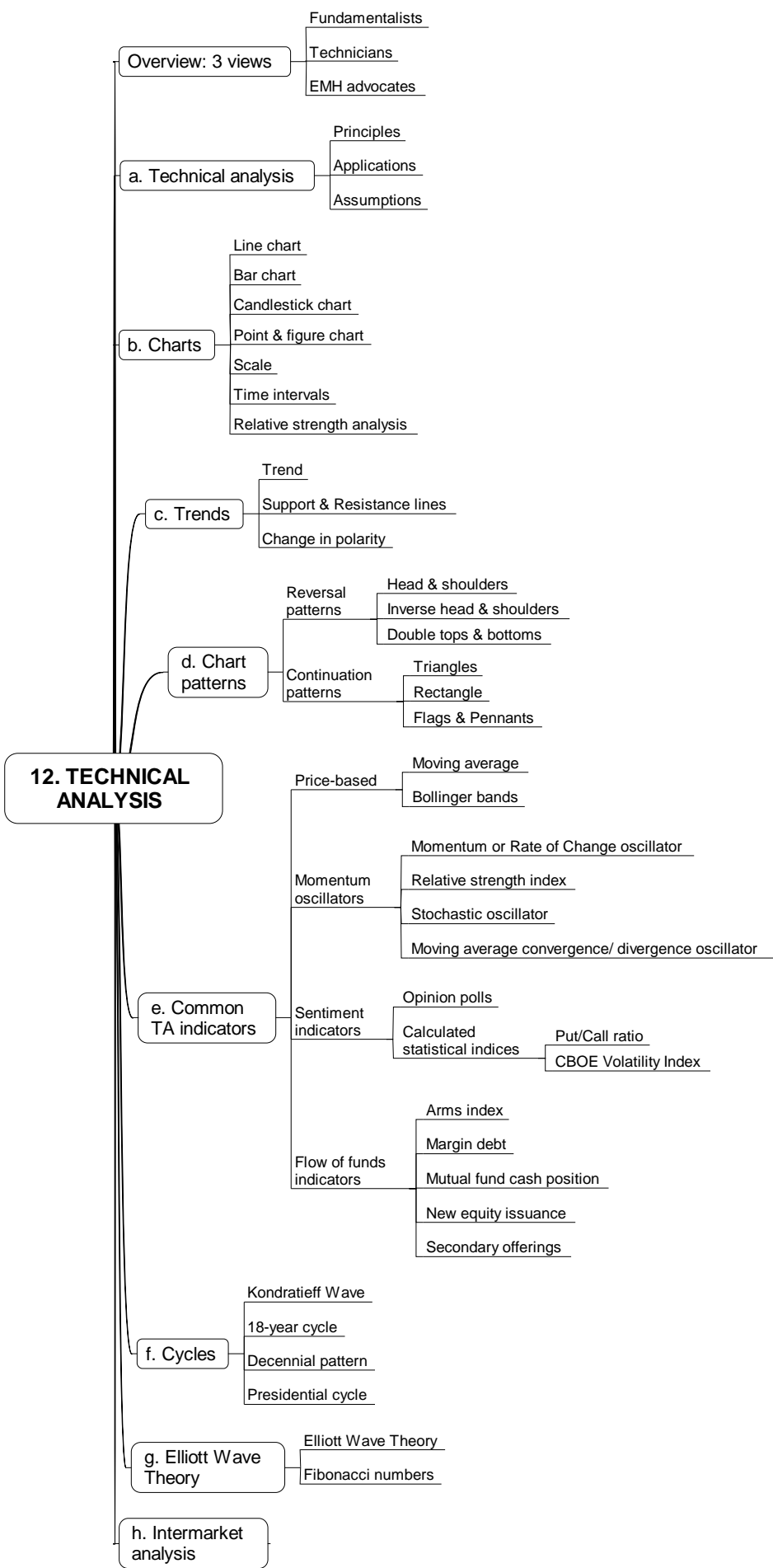
- Possible mistake: Observations from a different population may be included
- Higher Cost

Bias

- Data mining bias
- Sample selection bias
- Survivorship bias
- Look-ahead bias
- Time-period bias

# 11. HYPOTHESIS TESTING





**12. TECHNICAL ANALYSIS**

Overview: 3 views

- Fundamentalists
- Technicians
- EMH advocates

a. Technical analysis

- Principles
- Applications
- Assumptions

b. Charts

- Line chart
- Bar chart
- Candlestick chart
- Point & figure chart
- Scale
- Time intervals
- Relative strength analysis

c. Trends

- Trend
- Support & Resistance lines
- Change in polarity

d. Chart patterns

- Reversal patterns
  - Head & shoulders
  - Inverse head & shoulders
  - Double tops & bottoms
- Continuation patterns
  - Triangles
  - Rectangle
  - Flags & Pennants

e. Common TA indicators

- Price-based
  - Moving average
  - Bollinger bands
- Momentum oscillators
  - Momentum or Rate of Change oscillator
  - Relative strength index
  - Stochastic oscillator
  - Moving average convergence/ divergence oscillator
- Sentiment indicators
  - Opinion polls
  - Calculated statistical indices
    - Put/Call ratio
    - CBOE Volatility Index
- Flow of funds indicators
  - Arms index
  - Margin debt
  - Mutual fund cash position
  - New equity issuance
  - Secondary offerings

f. Cycles

- Kondratieff Wave
- 18-year cycle
- Decennial pattern
- Presidential cycle

g. Elliott Wave Theory

- Elliott Wave Theory
- Fibonacci numbers

h. Intermarket analysis