20110209

Review arima (google "Arima Introduction")
Read PCA paper
Linear algebra regression vs summation
Comogorf-smirnof test: used to test to see if the data fits a distribution

20110303

Risk on a 1 asset portfolo; 2.33 * sd (sigma)
Risk on a bond: position * PV01 * close * sd of the yield * 2.33 * 100
where sd of the yield * 2.33 * 100 is the potential movement in yeild measured in BP
ie total sensitivity * total move

PVIFA: Present Value Interest Factor Of Annuity

(1 - (1 + r)^-N) / r

Hedging bonds based on PV01:

if PV01 of 5 yr = x
and PV01 of 10 yr = y

you need x/y 10 yr to hedge.

CSPV01 refers to change in the value of the bond as a result of 1 bp change in credit spread.

CSPV01 != PV01

Excel: Indirect

X * V * X' = Variance

Declining Average Weighted average estimator (omega = 0.94 for example).

sigma (((x - avg(x)) / n) * omega_n / sigma (omege))

20110309

Historical Simulation

2.33 * Std Deviation moves are sometimes discarded in favor of the 10th smallest return (tenth largest downward movement)
i.e. using an emperical approach sometimes gives you larger numbers than the 2.33 * standard deviation methodology

In low yield environments things move in normal space rather than lognormal space.
TODO: Lognormal vs normal

During historical simulation: Return Based vs Percentage change based

Q. Why do we use historical simulations?
A. Because when things go haywire, the market does not follow risk impliled by the normal distribution.

Comodities: Comodities are not subject to VAR limitations.

Historical Simulation:
- take x observations.
- rank the pnl figures
- take the n% (=95%) worst number and calculate your VAR.

Data Filing:
- Regression: use for assets over loner time-periods
- Brownial Bridge: Non corelated assets over longer time-periods.

Historial simuation is Non-Parametric i.e. it doesn't depend on a parameter.

Derivatives repricing:
- create a vol surface: pnl vs vol and spot
- use historical price changes and vol changes to use the above surface to get your Var for the day.

Marginal VaR using variancorelated ce/Covariance:
Marginal VAR of Child = Covariance(Parent, Child) * Parent VaR / Variance(Parent)
Marginal VaR of FID = Covariance(Parent, FID) * Parent VaR / Variance(Parent)

Marginal VaR is a diagnostic tool to help figure out what triggered a large change in VaR.

Advantages of an Empirical Approach:
1. Intuitive appeal
2. Ease of error checking
3. Credit spread activity “built-in”
4. No maintained hypothesis of multivariate normality
5. Automatic scenario analysis

Mid-Term:
Buy Side, Institutions, Practices, What is importeant Buy Side Risk Manager.
Diff between Buy Side Risk and Sell Side Risk.
Interpreting Graphs
Identifying Trend.
Hypotheisis Testing (from HW)
Variance Cov Risk Calculations
Maasrures of Var.
Questions on Variance and Co-Variance

2 Buy Side Questions
Missing Data
Variance-Covariance

EDA
Duration
COnvexivity of P/E line and interpretation
Flattener?
What kind of a yield curve would I need to
It will look more like a HW question.

Hour to Hour and a Half.

Not gonna Ask Excel Function

Monte Carlo:
Eigen Vector factorization???

Risk class 20110312

Fund of Funds:
Advantages:
They do a lot of the research for you.
They provide liquidity at more frequent intervals than hedge funds.
Disadvantages:
Double fees
Leverage
Selection Bias: Some Hedge funds will not take Funds of Fund money because the FoF can withdraw at any time. So FoF's do not get the best access.

Index Funds: ETF's
Fully replicated Index Funds: SPY for example
    Characteristics: Very Passive
Partially replicated Index Funds: Uses the index as a benchmark but more actively manages to protfolo to magnify returns or mitigate risk (for eg buying puts) or only buying the best performing parts of an index.

Mutual Funds: Active Funds are like buying a little part of a trading desk. They are not as tightly constrained as an index fund.
They have exposure to Long Duration Bonds for eg: Strips (long duration zero coupon bonds), Alternative Energy bonds.

Insurance Risk:
Money flows from Policy Premiums -> Investment Fund -> Claims

Central tennant of insurance investment: Try to make sure that your investments are not correlated to your risk - for example, if insuring 100 state street, do not invest in 102 state street.

Insurance Risk Process:

Liability Cash Flows -> Risk Neutral Cash Flows -> Risk Adjusted Spread -> Benchmark Portfolio -> Assets

Risk Neutral Cash Flows: Buy 10 yr, 5 yr, 2 yrs. Sell 15 year TIPS, 20 year TIPS.

Different Kinds of Risk:
1. Concentration
2. Liquidity
3. Directional Risk
4. Volatility of Returns
5. Tail Risk.
6. Distribution of Returns.

Note: Value At Risk is only meaningful when compared to Expected Return.

Buy vs Sell Risk Management:

Fund (Buy) side risk:
- Concentration Risk.
- Asset Allocatin
- Performance Attribution
- Systemic vs. Idiosyncratic Risk
- Margin Optimization
- Liquidity
- Regulatory/Reputation Risk.

Bank (Sell) side risk:
- Market Risk
- Credit Risk
- Counterparty Risk
- Operational Risk
- Liquidity Risk.
- Reputational Risk.

email: donna.m.howee@gmail.com
header: Concentration Risk
Question: How do you deal with Concentration Risk.

Takeaway: Tracing Error, Information Ratio and Sharpe Ratio.

Beta: regress your stock against S&P and get Beta.

Do different Sectors give us different Tracking errors.