RISK EXPOSURE VISUALIZATION

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Risk Exposure is the quantative amount one stands to lose in an investment. For example, one of the risk exposure for financial firms would be the unsettled trade it may loose if the counterparty defaults. Financial Institutions often use Risk Management tools(eg. Kamakura[1] Risk Manager) to simulate estimated adjusted values using various risk factors like Interest Rates, Foreign Exchange, Spreads, Volatilities, Equities to quantitatively assess risk position.

KEY TERMS

ALL - ALL the possible values for a given attribute. For example, currency value "ALL" means list of currencies on which trade exposure is shown.

Advisor - Different business units within the firm.

Product - Different tradable entity. The products used are
- CS - Common Stock ex. APPL, GOOL etc
- CMO - Collateralized Mortgage Obligation (CMO) is a fixed income security that uses mortgage-backed securities as collateral.
- FX - Currency exchange; trade is conducted over the counter.
- MS - Mortgage based securities
- SWAP - An agreement between two parties to exchange sequences of cash flows for a set period of time.

Counterparty- Legal entity, to which an exposure to financial risk might exists.

Category - Category is a combination of Advisor, Product, Currency and Counterparty. For example a category can be Advisor1, CS, USD and JP Morgan.

Trade - Action of buying and selling financial products. Example - An Advisor1- can place a buy/sell trade on common stock Apple in currency USD with the counterparty JP Morgan for a certain amount.

Simulation Scenerios - The risk model uses Monte Carlo Simulation to generate various possible values for each trades based on various risk factors.

Value at Risk[2] (VAR) - Calculates the maximum loss expected (or worst case scenario) on an investment, over a given time period and given a specified degree of confidence. Here VAR is based on daily basis.

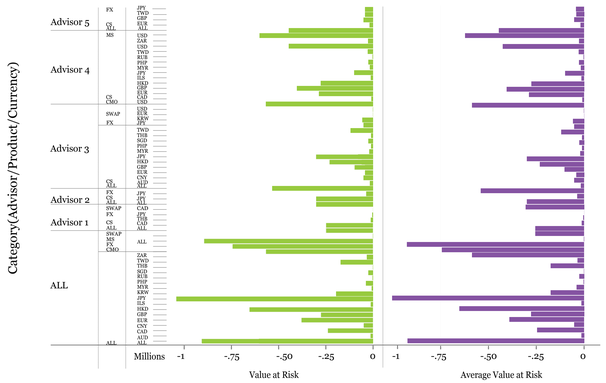
Average value at Risk (AVAR) - is the average value of the loss expected on worst 5% of cases over a given time periods and a given specified degree of confidence.The AVAR is calculated on daily basis.

Mean Value at Risk(MVAR) - Mean value at Risk (MVAR) calculated by model for a category considering all risk factors.

%Change - Deviation between mean value at risk and the value at risk for a category and the various risk factors

What is the notional comparison of VAR and AVAR across Advisor, Product and Currency ?

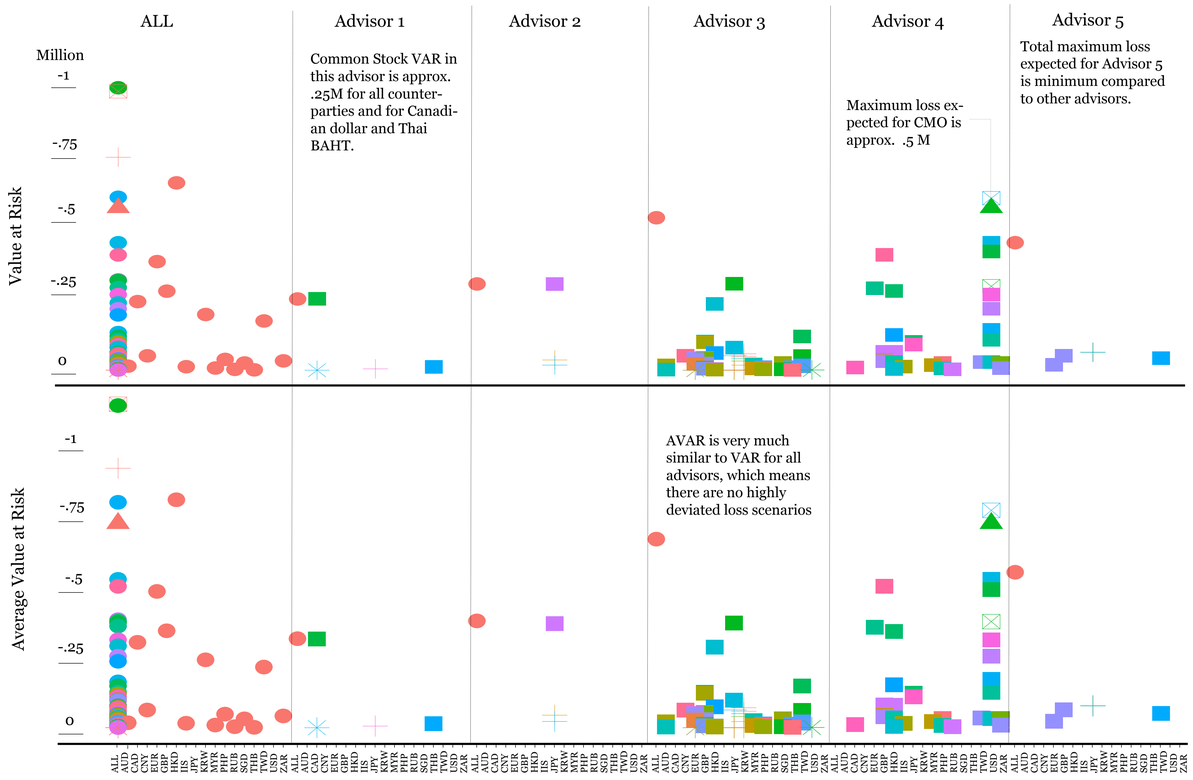
Sketch 1 - The bar graph shows the notional comparison of VAR and AVAR for all advisor, product and currency.



1 - http://www.kamakuraco.com/ProductsServices/KamakuraRiskManager.aspx
2 - http://www.investopedia.com/articles/04/092904.asp

What is the comparison of exposure among advisors?

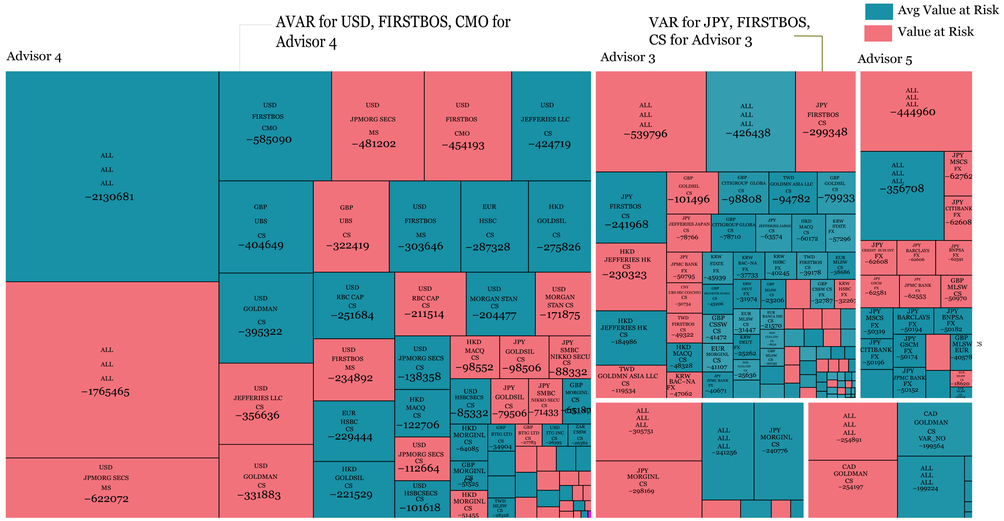
Sketch 3 - This scatterplot shows the detailed(for each product, counterparty and currency) VAR and AVAR comparisons among advisors. Scatterplot for advisor 3 and 4 is very dense, indicating that they have a lot of unsettled trades due to which they are exposed more compared to advisor 1, 2 or 5. Similarly, it also compares the AVAR among all Advisors.



Data is cleansed to fit the scale.

What is the exposure associated with particular category (e.g. Advisor 4, USD, CMO and FIRSTBOS)?

Sketch 2 - The tree map shows the VAR and AVAR for all the categories. Values are sequenced by Currency, Counterparty, Product for each advisor.



SOURCE

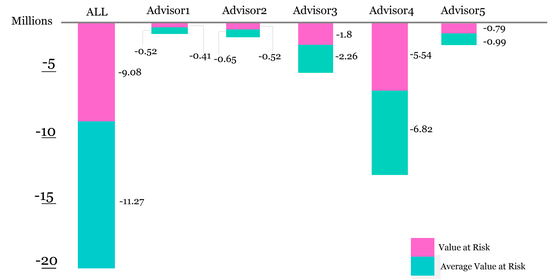
Data is sourced from Kamakura Risk Manager software. A post processing is performed on the data by using pl/sql program to prepare it for visualization.

AUDIENCE

The audience is the quantitative risk analysts. They are responsible to perform deep, thoughtful analysis by researching and developing analytics on various investment types.Their work eventually helps the company to define, measure and ultimately manage its financial risk. In order to formulate robust and actionable recommendation, they need to explore questions like total value at risk, average value at risk, comparison of risk exposure among advisors, deviation from mean and total exposure associated with the firm on day to day basis.

What is the Total Risk for all the categories across all advisors exposed on a particular day?

Sketch 5 - Stacked bar graph shows the distribution of VAR and AVAR for all advisors as well as each advisor level.



What is the deviation from the mean for all categories for various risk factors? What are the outliers?

Sketch 4 - The Risk Model generates the mean value of exposure in each category with respect to a riskfactor. The exposure values generated by the model for each risk category are deviated from the mean by some percentage. The below graph shows the deviation percentage.