**Alakh niranjan Singh**

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**SUMMARY**

* **Total over 15 years of Financial Service / Policy Making, Quantitative Economic Research and Industry’s Analysis Experience in India, in Singapore, and in the USA on Corporate Finance, Equities, Fixed Income, Commodities, FX, and Derivatives** with ability to build and maintain strong working relationships with senior and junior business sponsors, as well functional specialists.
* **Seven years of CCAR/DFAST/Volcker Rule/PPNR/CECL/FFIEC/FR2510 Business Analysis and model building or validation on SAS/MATLAB/Excel Regression** experience for analysing data and building quantitative models to comply with BCBS 239. **I programmed in C/C++, macros, and VBA in excel 2010,**
* **Seven plus years of experience** SDLC, Agile system building for financial reports (AFS III, CMA, P&L reports) as per US GAAP of companies, capital budgeting, preparation & reconciliation of financial statements.
* **Three years of SQL, Access and oracle experience.** Can write complex queries to retrieve data from database or even assist the software team to build data bases containing required information.
* **Five years of equities research, trading and securities lending experience. Traded in equities using Aladdin & Murex;** Built Order Driven Trading Platform of Mortgage-backed Securities at Broadridge Financial Services.
* **Expert at Risk analysis**: (**δ(Delta), γ(Gamma) & σ(sigma)** Risk) of **Derivatives** and other risks (Duration) of **Fixed Income Securities, (Volatility) of Equities & VAR of Portfolio as per Basel III agreement.**

 **I T SKILLS:**

* VBA, AWS (Amazon Web Service), Amazon Redshift, Python (Scripts), Netezza SQL, Data modeling & Analysis, MS Access, MS Excel (Advanced), MS Word, PowerPoint, Project, Visio, SDLC, Agile, JIRA
* SAS, SAS database integration, R, E-VIEWS, MATLAB, ARMA, Database solutions, LINDO, Bloomberg, Aladdin, Thomson Reuters, Eagle Pace, BISAM Performance Measurement Analysis and GIPS
* Experience on **Machine Learning** models like SVM, K-Means Clustering, ARMA, GARCH modeling in R and **Python**

**EDUCATION:**

* **Ph.D. ABD (Economics) UCONN, MSc (Quantitative Modeling) UK, MBA (Finance) Thunderbird,**
* **CFA Charter holder 2015**
* **Standardized Test Scores**: GRE: Quant-800, Verbal: 660, Written: 5; GMAT: 690, Written 5.5

**PROFESSIONAL EXPERIENCE:**

**Evolvers Group, Fort Worth, TX July 2019 – Till Date**

***Sr Business Analyst & Project Manager SAS and Healthcare Equity Researcher for Singular Research.***

* I study and analyze the 10-Q reports (Income Statement (P&L), Balance Sheet, Cash Flow Statement, and other financial reports), revenue and expenses curves (trends) of Healthcare Companies in detail.
* Evaluate the financial statements to predict equity price or seek alpha of Healthcare companies.
* Built and update the system through ETL for FHIR for exchanging healthcare information electronically.
* Worked on in-house projects related to Financial risk models of CCAR, 14 A, M, Q and Part 30 by QRM in SAS database. Conducted meetings and monitored status reports.
* Using SAS and SAS SQL in mainframe system analyzed the data and validated the models of equity domain.
* Using SQL updated the software of Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) reports as per Basel III. Tracked the agile projects in JIRA.

**DWS Investments, 345 Park Avenue, NY December2018 – July 2019**

***Business Analyst/Data Analyst***

* Wrote BRD, FS with Use cases, and Test Cases for ETL and SAS Mainframe database to implement Regulation YY of Federal Reserve System for treasury management as input for managing liquidity risk (LCF, NSFR) for RWA in CTB (Change the Business) capacity to comply with FR2052a, TIC and BCBS 239.
* For liquidity risk compliance as per Basel III and DFAST, conducted gap analysis, framed the new solution design using ETL, and built the relational data base system using agile methodology with he offshore Indian team to automate the reporting of projected and actual cash inflows, outflows and the net cash balance (liquidity) for brokerage division on equities, fixed income (HTM and AFS securities), loans (credit cards, student loans, wholesale loans), derivatives and FX (Libor, and Euribor costs) for 30 days and calculate the liquidity ratio. Then combined the normal time data base net liquidity position (liquid asset balances) with stressed data base and severely stressed data base scenarios for capital planning programs.
* Using agile with JIRA, built the system for Portfolio and Portfolio Manager performance reporting on contributions from sector selection, rating selection, pricing and trading of Fixed Income (treasuries, bonds, RMBS, CMBS, ABS, Libor FRs and Futures) and Equities in Eagle Pace, BISAM, and Qlik System. Automated the system by facilitating and validating ETL (extract, transform and load) for BISAM, then to Eagle Pace to capture the daily data from Sophis Risque, Murex, and Blackrock Aladdin Trading Platforms. From Eagle Pace transferred the data to Qlik system.

**Mizuho Bank, 1251, 6th Avenue, NY October20 17 – November 2018**

***Quantitative Business Analyst Model Validation Equity and Debt Capital, CCAR and DFAST***

* Wrote BRD, FS containing use cases and Test cases (Waterfall SDLC) to the automate the validation report as per IFRS and US GAAP of the scenario expansion model of Moody’s Analytics, QRM, and Risk Metrics (MSCI) for CCAR, FRY 14, FRY 2052a, FFIEC 009, 016, 102, Part 30, and DFAST/Volcker Rule regulations from PPNR to Regulatory Capital, RWA, Treasury management (for zero risk weight) and FR2510 in RTB capacity. Automated the system to capital planning in different scenarios of stress testing in Tableau.
* Wrote documents to build database for SAS to automate validation report of Equity Capital, Debt Capital in models fixed income (AFS & HTM) and QRM for mortgage market risk, and Derivatives’ pricing Models, Profits from Securities Lending, margins, collateral management, credit cards, Credit Risk (CVA) based on corporate finance payments, Market Risk, Liquidity Risk, Tax, and Operational Risk models. In market risk of the brokerage division the system validates VaR calculation at 95% and 99% confidence intervals, under baseline, stressed and severely stressed scenarios for Equities, Treasuries, Corporate Bonds, MBS, ABS, Convertibles, FX, Real Estate, Hedge Funds, Private Equity, Interest Rate Market Risk, Derivatives (calls, puts, collar, straddle, butterfly), CDS, CDX and the entire portfolio calculated by MSCI (Risk Metrics), and Moody’s Scenario Expansion for Mizuho Bank to comply with Basel III, CCAR and DFAST including Section 13 related to Volcker Rule and consequent hedging requirements.
* Included in the BRD (Agile method) the PD, LGD, and EAD as inputs to validate Counter Party Credit Risk based on corporate finance payments, default risk of credit card, car loans, HELOC and wholesale loan risk models for APAC regions. Coordinated with the offshore team in India and APAC region while scheduling conference calls and other interactions. In operational risk included the concepts of certain historical percentage of assets as operation losses for each type of event such as fire, computer failures, employee thefts, hacking, frauds and the judgmental analysis of losses under three different scenarios (normal, stressed and severely stressed). Developed the custom PD Analysis reports in **Python**
* Updated the system of AFS III lending by adding more loan accounts to borrowers’ lists.
* Explained fair lending business concepts of FCRA, UDAAP, HMDA and TILA to the development team to automate the system as per USGAAP from PPNR to Regulatory Capital under FRY 9, FRY 11 & FRY 14 for FED and OCC. Managed the issues and work progress in JIRA.

**Bank of America, 95 Green Street, Exchange Place, NJ May 16 – September 2017**

***Quantitative Business Analyst and Project Manager Basel III, CCAR and Prime Brokerage Margin Risk***

* Conducted meetings to build the system to report validated market risk models of VaR calculation at 95% and 99% confidence intervals for equities, bonds, convertibles, commodities, FX, hedge funds, private equity, derivatives, credit cards, CDS, CDX, and the entire portfolio calculated by MSCI (Risk Metrics), and QRM software for mortgage backed securities, for Bank of America Merrill Lynch to meet the demands of Risk Reporting to clients and comply with Basel III/DFAST/Volcker Rule, and FED’s CCAR in RTB capacity.
* Using agile methodology, wrote change management (agile) BRD & FRD for the standard initial margin model (SIMM) to calculate initial margin for non-cleared derivatives as per BCBS and the IOSC**.**
* Wrote test cases for the QA team for the software that prepares **VaR amount** on daily basis for Hedge Funds & Traders, bi-weekly basis for Basel III Reporting, and Quarterly and Annual VAR to match Performance Measurement cycles of Investment Managers. Sprint planned to calculate risk addition to portfolio by adding each new Asset Class **(IRC**) to existing portfolio and comprehensive risk measure (**CRM)** on annual basis.
* Explained the technology team in understanding any issue related to results from R, SAS, SPSS and Excel Timeseries Quantitative model’s results of Prime Brokerage Services including meaning and business logic of quantitative market risk, credit risk and liquidity risk models for calculating riskiness of a portfolio and consequent margin requirements (initial and variation margin) on daily basis, benchmarking, securities lending, RWA, and performance attribution of portfolio manager.

**Oppenheimer Funds, 225 Liberty Street, New York April 15 – April 2016**

***Sr. Analyst (Subject Matter Expert): Performance & Risk Based Attribution of equities, fixed income (including distressed credit), commodities, derivatives & FX***

* Using agile methodology and JIRA, designed performance measurement and attribution models as per risk bets of the fund sponsor and fund manager on Aladdin and BISAM softwares.
* Built ARMA and ARIMA time series models for estimating returns of different asset classes.
* Built market risk data base including VaR forecasting models for equities, fixed income, foreign exchange, commodities and the entire portfolios using ARCH, GARCH, EGARCH, LMGARCH models for estimating Martingale and long-memory variance series.
* Automated the system for calculating multi-factor attribution return to **equities' composites** on account of cash & beta timing, fundamental risk factors, economic sectors & unexplained factor return attributed to investment manager.
* Built the quantitative model that decomposed total return attribution for **Fixed Income composites** into external interest environment over which manager has no control, though he/she could indirectly predict the expected changes and internal skills of manger. At management level attribution returns contained: (i) Interest rate management effect (Duration, Key Rate Duration & Convexity), (ii) Sector/quality effect, (iii) Security selection effect, and (iv) Trading activity return.
* Validated the models using out of sample data and actual returns with the validation team.

**Exl Service, 10 Exchange Place, Jersey City, NJ (Client PNC Bank) July 2014 – April 2015 *Sr Quantitative Modeler, CCAR & DFAST for Student Loan, Credit Card, Auto Loans.***

* Conducted uni-variate analysis of defaults and deposits and RWA, treasury management for PNC bank under normal macroeconomic situation, stressed situation, and severely stressed situation.
* Built the quantitative model to calculate the Probability of Default (PD), Loss Given Default (LGD) and Exposure at Default (EAD) using data for 10 years with different segmentation variables such at FICO Score, single or multiple borrower, collateral kind, geography, vintage year etc. to model exposure of risk capital and expected losses under different macroeconomic scenarios. I calculated long run default rate (PD) and short run default rates (PD) for each segment so that a good segmentation level PD, LGD and EAD estimate can be made as per the changing economic scenarios.
* Built internal stress testing models of ICAAP for compliance with DFAST (Dodd Frank Act Stress Test) in CTB capacity. These models were similar but somewhat different from CCAR model as the estimates were internally generated rather than using the FED supplied data.
* Built **Probit & Logit** quantitative models for wholesale loans to calculate probability of being rated as CCC.
* Built Time-series regression macroeconomic models for normal, stressed and severely stressed scenarios and linked the segmentation model results with macroeconomic scenarios so that the best fit line could be created. The portfolio contained student loans, credit cards, and auto loans. I used OLS Model as well as ARMA (Auto Regressive Moving Average) Models. Documented the quantitative results for submission to Regulators.
* Validated the robustness of the model by running the model on **out-of-sample** time series data and tested the results if **RMSE, AME, AMPE** had reduced or if adjusted **R^2** had increased from before or if the results matched closely against the sample data results without systematic biases such as underestimation, overestimation or non-zero error sums. Documented the results for submission to FED.
* Using Markov-functional form designed mathematical models **(SABR)** for valuation of interest rate derivatives (Interest Rate: Futures, Forward, Swaps, Call/Put Options, Caps, Floors, & Collars) as per Black-Karazinski Model, Hull-White Model, and Cox-Ingersoll-Ross Model. Compared the **implied volatility of SABR model with reasonably representative historical volatility**. This was enrichment of my AIG experience and contribution to Morgan Stanley Smith Barney. For valuation of **FX derivatives** I used Black-Scholes-Merten Model, Heston and Local Volatility Model and calibrated with local volatility.

**Deutsche Bank, Plaza 2, Exchange Place, Jersey City, NJ January 14 – June 2014 *Business Analyst (UAT), CCAR, DFAST in reporting of income Statement, Balance Sheet (FRY 9C) from equities, fixed income, commodities, derivatives & FX, and Stress Testing Credit and Market Risk(FR Y14 A,Q & M)***

* Wrote BRD for Credit Risk models and their distribution characteristics under normal, stressed and severely stressed conditions with the 25 variables (13 US Domestic and 12 External variables of four regions affecting US economy) for compliance with CCAR to meet the requirements for an IHCs in compliance with Dodd Frank Act & Basel III.
* Wrote Functional Specification Documents (FSD), about 50 use cases and 30 Unit Test Cases and 50 Business Test Cases related to Market Risk and its distribution characteristics, Stressed Market Risk as per Basel III for conducting Unit Testing and UAT for evaluating the AxiomSL software at Deutsche Bank as per IFRS accounting principles. Additionally, I wrote BRD & FSD for Schedule FRY 9C HC-H for Interest Sensitivity.
* Wrote BRD, FS and test cases to automate the software that prepared report for Investors and Portfolio Managers measuring **Value at Risk (VAR)** of Portfolio containing asset classes of Fixed Income Securities including Mortgage Backed Securities, Equities, Commodities (Oil, Gas and Metals), and Currency(FX) individually and of total Portfolio along with Diversification Effect at 95% confidence level with actual historical market data. I documented FSD for all the three methods of VAR calculation: Variance – Covariance Method (Analytical), Historical Method using 5 year period with different annual weights, and Mote Carlo Simulation method at (asset class level) for submission to clients / investors.

**BNYMellon, 1 Temasek Avenue, Singapore      December 11 – July 2013 *Sr. Business Analyst (CCAR with focus on Credit & Market Risk)***

* Wrote BRD and FS for risk measurement of Fixed Income Securities to calculate different kinds of market risks (Duration, Key Rate Duration, Spread Duration, Duration to the worst, Convexity, and VaR) for the Asia Pacific (APAC) region. The software gave detailed information about Nominal Spreads, Zero Volatility Spreads, Option Adjusted Spreads, Swap Spreads, Clean Price Vs Dirty Price which includes accrued interest until the date of sale of FI security, for finding the relative attractiveness (expected performance) of Fixed Income securities.
* Automated the system for calculating profits from equities lending of their custodial business services.
* Upgraded the system for calculating the capital adequacy and capital planning for next nine quarters (14A, Q & M) against the risk weighted assets (RWA) of the bank.
* For Sovereign Government bonds built SAS time series multi-factor model for credit risk based on independent factors of Tax revenues, Per Capita GDP growth, Ability to impose new taxes, Returns from Government Enterprises, committed expenses, flexibility of cutting expenses, fiscal discipline, foreign exchange reserves, ability to borrow from IMF, and Balance of Payments were the independent variables for assessing credit worthiness of sovereign bonds.
* Built credit risk models to calculate the expected Loss = PD \* LGD \* EAD (where PD = Probability of Default, LGD = Loss given Default, & EAD = Exposure at Default) for accrual loans and Probit and Logit models for Wholesale loans.
* Upgraded the system of Market risk modeling in SAS software for Fixed Income Securities, Commodities and Foreign Exchange using **GARCH (1,1)** Model for **Value at Risk (VAR) under different probability distribution models,** and **Tail VAR** as per **Basel II/III** requirements.

**Morgan Stanley Smith Barney, One New York Plaza, New York       October 09 – December 2010 *Quantitative Analyst (Performance & Risk Measurement):***

* Using SAS platform built Quantitative GARCH Models (Using Risk-metrics techniques) for Traders and my Portfolio Manager measuring market risk of Equities, Fixed Income securities, Interest Rates & currency (FX) movements of financial sector. I made a macro-economic factor model to predict movement of interest rates & inflation which could be used as inputs for valuing Derivatives of equities and Fixed Income securities (bonds, RMBS, CMBS, ABS) of financial companies. This model was extended to predict movement of interest rates as input for refinancing possibilities and their implications to prepayment risks of Agency mortgage backed securities. The other inputs that I used to value Option Adjusted Spreads **(OAS)** of Agency Mortgage Backed Securities were PSA prepayment rates of specific pools, WAC, WAM, Pool Nature, Pool Character and Support tranche burn out.
* Prepared quantitative regression models for measuring credit risk of loans granted by financial institutions with macroeconomic surprises apart from studying their financial reports detailing their monthly, quarterly and annual financial positions.
* Prepared report for Traders, Investors and my Portfolio Manager measuring **Value at Risk (VAR)** of Portfolio containing Equities, Fixed Income Securities, Commodities, Interest Rates, Currency Rates individually and of total Portfolio along with Diversification Effect. I used all the three methods of VAR calculation: Variance – Covariance Method (Analytical), Historical Method using 5 year period with different annual weights, and Mote Carlo Simulation method for submission to clients / investors. I also gathered information on how the Portfolio Managers were managing their market risk using interest rate and foreign exchange derivatives. I prepared the report on daily basis for Hedge Funds & Traders, bi-weekly basis for Basel II Agreement, and Quarterly and Annual VAR to match Performance Measurement cycles of Investment Managers. Calculated risk addition to portfolio by adding each new Asset Class to existing portfolio. Also did **stress test analysis for abnormal situations**.
* As Buy Side Analyst, I researched and prepared report for my Portfolio Manager measuring expected prices of equities of energy sector of India: Reliance Industries Ltd., Essar Energy, JSW Energy Ltd, Lanco Infratech, Adani Power & Astonfield, I started with Bottom-Up Approach i.e. built excel based cash flow models (dividend discounted cash flow valuations, free cash flow to firm discounted model, free cash flow to equity discounted models, and Residual Income discounted Models, comparable company analysis, and P/E multiples) in my analysis. Then I made macro-economic factor models of India to predict demand and supply of energy sector in the next 5 future years.
* Built Quantitative Macroeconomic Factor Models for India, China and Vietnam estimating GDP growth rates and inflation from demand & supply side factors. Then used that information for measuring market risk for valuing of stocks of those countries. Prepared suitable benchmark as per GIPS for such investments.
* Analyzed gross and net returns of portfolio of equities, fixed income securities, derivatives, and foreign currency on daily basis, monthly basis, quarterly basis and annual basis. Calculated both kinds of returns: time weighted return and money weighted returns in local currency and base currency. Built suitable benchmarks befitting the composition of the portfolio. Prepared attribution report of Equities and Fixed Income securities at macro (fund sponsor) and micro (individual portfolio) levels.
* Built client reporting risk management platform to report Duration & Convexity for Fixed Income Securities, Beta and Sharpe Ratio for passively managed Portfolios and Information Ratio for Actively Managed Portfolios, and Greeks (Delta, Gamma, Theta, Vega, & Rho) for Options.

**Broadridge, One Park Avenue, New York City                   November 15th ’08 –  September 30th '09 *Credit Trading Business Analyst for Fixed Income Trading Platform Project MBS Expert and ImpactTM***

I wrote

* Business Requirement Documents (BRD), Functional Specifications (FS) with Use Cases and System Architecture Design (SAD) documents for **available for sale against stipulated demand** for MBS/ABS Fixed Income bond classes so that the buyers (mostly trading on margin) looking on the trading platform could choose which securities to purchase. For pricing the MBS Options I wrote functional specifications about how to use Monte Carlo Simulation when the cash flow was interest rate path dependent.
* Business Requirement Documents (BRD), Functional Specifications (FS) with Use Cases and System Architecture Designs (SADs) document for **unsolicited sale** securities in which the sellers could post the securities which they wanted to sell even though they did not have stipulated demand for those securities at that time, but in future some buyer might get interested after analyzing those securities.
* Wrote System Architecture Design (SAD) document for the Hub that would support communication between suppliers and buyers of securities.
* Designed the screen of the trading platform containing important SQL queries on the screen for traders to choose the right kind of MBS securities.
* Wrote BRD for the database to ensure data integrity.

**AIG, Pine Street, New York City                                                              January ’08 –  September ’08 *Business Analyst (Finance) for Business Information Group in R&D Division***

* Wrote BRD and FS to build the system on AML and KYC to comply with OFAC.

**Bank Of New York Mellon, Everett, MA                                                March ’07 –  February 15, 2008 *Se******nior Analyst (Performance Measurement & Attribution)***

* Built Eagle Pace investment performance measurement and attribution system for equities, fixed income.

**Fidelity Investments, Jersey City, NJ                                                               November ’06 – March ‘07 *Financial Business Analyst (UAT)***

* Built Tax lot accounting system for fixed-income securities to report tax liability for the investors.

**MBA Student at The Global School of Management, Thunderbird, AZ           August ’05 – October ‘06**

**Deputy Economic/Financial Adviser (General Manager) to Government of India   November ’04 – August ‘05**

***Financial and Economic Policy Analysis***

* Led the quantitative economic and financial analysis team for building sound economic policies.

**University of Colorado, Denver, Colorado, USA                                              September ’03 – November ’04 *Adjunct Professor of Economics and Finance***

* Taught mathematical economics and econometrics using SAS and Eviews software.

 **Western New England College, Springfield MA:                                                         January ’01 – Aug ’03 *Adjunct Professor / Instructor of Economics & Finance***

* Taught macroeconomics, international financial models, and econometrics using SAS software.

**PhD. Economics Student at the University of Connecticut, Storrs, CT         August ’99 – May ‘03**

**CCAR / DFAST Expertise Note**

Presented Papers on:

1. **Credit Card Business Implications for CCAR** at International Atlantic Economic Society Conference, Boston on 10/11/2015. Older publications are in the end.

2. **Prevention is Worse than the Disease – the Case of CCAR and Basel III**, 10/14/’16, at 82nd International Atlantic Economic Society Conference, Washington DC