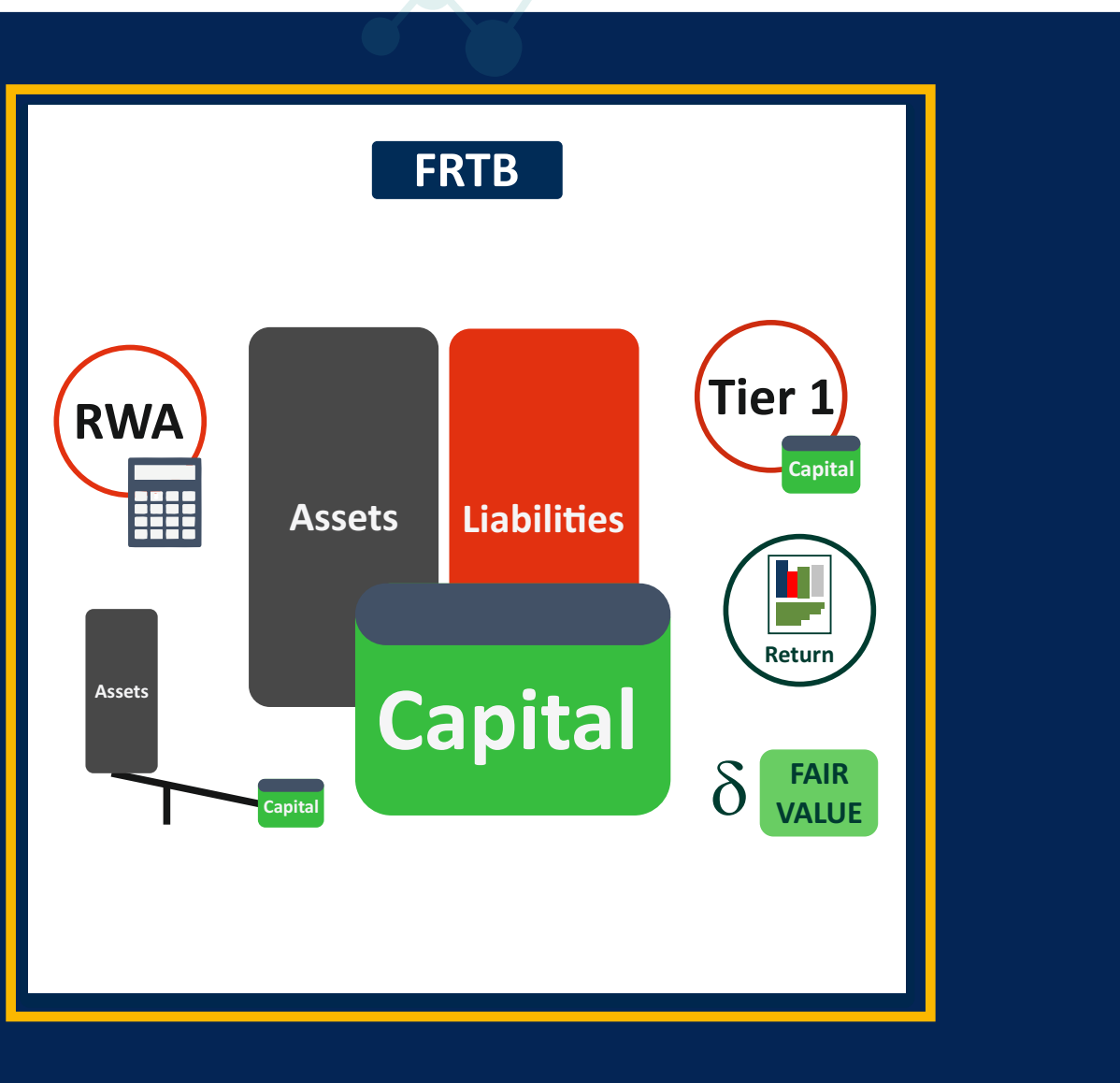


MARKET RISK MODELLING using Excel

50+ hours

Case Study and Project- driven Methodology

Blended Learning Methodology



PEAKS²TAILS



DETAILED CURRICULUM

MONTE CARLO SIMULATION IN EXCEL

- Concepts of Probability Distributions
- Generating Random Numbers of different distributions using Excel functions:
 - a.RAND, RANDBETWEEN
 - b.NORMINV, NORMSIN
 - c.NORMDIST, NORMSDIST
- Simulating Geometric Brownian Motion in Excel
- Simulating Ornstein Uhlenbeck Model in excel
- Generating Correlated Random Numbers in excel using Copulas
- Choloskey Decomposition using Excel

FIXED INCOME ANALYTICS IN EXCEL

- Yield Curve Construction in Excel
 - a. Bootstrap methods
 - b. Linear Interpolation
 - c. Cubic Spline Interpolation
- Risk Measures
 - a. Durations and Convexity, PV01
 - b Asset Liability Management using Excel

EQUITY ANALYTICS IN EXCEL

- Option Pricing using Monte Carlo Simulations
- Option Pricing using Blacksholes and Binomial
- Option pricing in Indian Markets using Regression & VIX
- Exotic Options using Monte Carlo Simulations

INTEREST RATE ANALYTICS IN EXCEL

- Term Structure of Interest Rates
 - a. Vasicek Model
 - b. CIR Model
- Valuation of Int Rate swap
- Valuation of FRA
- Valuation of FX forward
- Valuation of Swaption



DETAILED CURRICULUM

MARKET RISK ANALYTICS

VOLATILITY ESTIMATION TECHNIQUES

- Simple Moving Average approach
- Exponential Weighted Moving Average approach
- GARCH Model
Volatility adjusted for Fat tails and time weighting

CALCULATION OF VAR & EXPECTED SHORTFALL

- Delta Normal
- Historical Simulation
- Monte Carlo Simulation
- VaR for Stock, Bonds & Derivatives
- Explore ways to compensate for Fat tailed volatility & timeweighting to calculate VaR

BASEL FRTB

- Overview, FRTB Building Blocks, Computation requirements
Standardised approach: Interest Rate Risk, Credit Spread Risk,
- Equity Risk, FX Risk, Commodity Risk, Default Risk Charge, Model Add-On
- Advanced Measurement Approach - Expected Shortfall, Default Risk Charge
- P/L Attribution & Backtesting

STRESS TESTING

- Design stress scenarios based on risk factor volatility and correlation across different asset classes
- Measuring portfolio stress risk exposure
- Adjust stress scenarios for fat tails, time weighting & liquidity

BACKGROUND

OBJECTIVE

ATTENDEES

PEDADOGY

BACKGROUND

With the creation of global financial networks, banking systems around the world are undoubtedly inter-connected. At the same time, changes in equity prices, interest rates, commodity prices and currencies, i.e. market risk, began to play an increasingly important role in overall risk exposure of financial institutions. Recent global financial crisis forcefully demonstrated the importance of effectively measuring and managing risk and, in particular, market risk markets, it is not possible to accurately predict the future value of a portfolio. Every financial institution with a portfolio exposed to market risk should have a model in place which is designed to measure that risk..



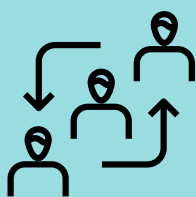
OBJECTIVE

Understanding of Equity, Interest rate & Foreign Exchange Derivatives
Implement Complex Monte Carlo Simulations in Excel
Build Derivatives Pricing Models in Excel
Build Excel models to quantify Value-at-Risk & expected Shortfall
Practical implementation of FRTB Standardised Approach and Internal Model Approach
Understanding Backtesting & Stress Testing



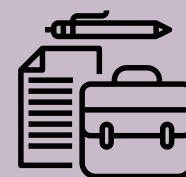
WHO CAN ATTEND

Academics/students – Students can substantially improve their recruiting chances if they are knowledgeable in this important and current topic. Banks are currently looking for talents who want to join banks on their Market Risk domain – journey.



PEDADOGY

Professionals working in analytics field or students interested to make a career in analytics.



DEMO MODELS

DURING THE PROGRAM YOU WILL LEARN TO
CREATE EXCEL MODELS LIKE SHOWN BELOW

Backtesting Pass/Fail

in Black X, Check X to include the model, however the Option is not actively traded
 indicate values for the Option. Assume 20% volatility for the underlying asset & 4 risk factors (S, L, V, R)
 adding back users only the most price ES as the implied factor to calculate ES.
 no correlation & no diffusion process required.
 no VaR and no ES, in this case we use the historical VaR from the Option.
 correlation implied from the ES & VaR.
 Anyway?

ES	VaR	ES - VaR	ES / VaR	ES - VaR	ES / VaR
0.0495	0.0542	-0.0047	0.9131	0.0495	0.9131
0.0496	0.0543	-0.0047	0.9131	0.0496	0.9131
0.0497	0.0544	-0.0047	0.9131	0.0497	0.9131
0.0498	0.0545	-0.0047	0.9131	0.0498	0.9131
0.0499	0.0546	-0.0047	0.9131	0.0499	0.9131
0.0500	0.0547	-0.0047	0.9131	0.0500	0.9131
0.0501	0.0548	-0.0047	0.9131	0.0501	0.9131
0.0502	0.0549	-0.0047	0.9131	0.0502	0.9131
0.0503	0.0550	-0.0047	0.9131	0.0503	0.9131
0.0504	0.0551	-0.0047	0.9131	0.0504	0.9131
0.0505	0.0552	-0.0047	0.9131	0.0505	0.9131
0.0506	0.0553	-0.0047	0.9131	0.0506	0.9131
0.0507	0.0554	-0.0047	0.9131	0.0507	0.9131
0.0508	0.0555	-0.0047	0.9131	0.0508	0.9131
0.0509	0.0556	-0.0047	0.9131	0.0509	0.9131
0.0510	0.0557	-0.0047	0.9131	0.0510	0.9131
0.0511	0.0558	-0.0047	0.9131	0.0511	0.9131
0.0512	0.0559	-0.0047	0.9131	0.0512	0.9131
0.0513	0.0560	-0.0047	0.9131	0.0513	0.9131
0.0514	0.0561	-0.0047	0.9131	0.0514	0.9131
0.0515	0.0562	-0.0047	0.9131	0.0515	0.9131
0.0516	0.0563	-0.0047	0.9131	0.0516	0.9131
0.0517	0.0564	-0.0047	0.9131	0.0517	0.9131
0.0518	0.0565	-0.0047	0.9131	0.0518	0.9131
0.0519	0.0566	-0.0047	0.9131	0.0519	0.9131
0.0520	0.0567	-0.0047	0.9131	0.0520	0.9131
0.0521	0.0568	-0.0047	0.9131	0.0521	0.9131
0.0522	0.0569	-0.0047	0.9131	0.0522	0.9131
0.0523	0.0570	-0.0047	0.9131	0.0523	0.9131
0.0524	0.0571	-0.0047	0.9131	0.0524	0.9131
0.0525	0.0572	-0.0047	0.9131	0.0525	0.9131
0.0526	0.0573	-0.0047	0.9131	0.0526	0.9131
0.0527	0.0574	-0.0047	0.9131	0.0527	0.9131
0.0528	0.0575	-0.0047	0.9131	0.0528	0.9131
0.0529	0.0576	-0.0047	0.9131	0.0529	0.9131
0.0530	0.0577	-0.0047	0.9131	0.0530	0.9131
0.0531	0.0578	-0.0047	0.9131	0.0531	0.9131
0.0532	0.0579	-0.0047	0.9131	0.0532	0.9131
0.0533	0.0580	-0.0047	0.9131	0.0533	0.9131
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0.0535	0.0582	-0.0047	0.9131	0.0535	0.9131
0.0536	0.0583	-0.0047	0.9131	0.0536	0.9131
0.0537	0.0584	-0.0047	0.9131	0.0537	0.9131
0.0538	0.0585	-0.0047	0.9131	0.0538	0.9131
0.0539	0.0586	-0.0047	0.9131	0.0539	0.9131
0.0540	0.0587	-0.0047	0.9131	0.0540	0.9131
0.0541	0.0588	-0.0047	0.9131	0.0541	0.9131
0.0542	0.0589	-0.0047	0.9131	0.0542	0.9131
0.0543	0.0590	-0.0047	0.9131	0.0543	0.9131
0.0544	0.0591	-0.0047	0.9131	0.0544	0.9131
0.0545	0.0592	-0.0047	0.9131	0.0545	0.9131
0.0546	0.0593	-0.0047	0.9131	0.0546	0.9131
0.0547	0.0594	-0.0047	0.9131	0.0547	0.9131
0.0548	0.0595	-0.0047	0.9131	0.0548	0.9131
0.0549	0.0596	-0.0047	0.9131	0.0549	0.9131
0.0550	0.0597	-0.0047	0.9131	0.0550	0.9131
0.0551	0.0598	-0.0047	0.9131	0.0551	0.9131
0.0552	0.0599	-0.0047	0.9131	0.0552	0.9131
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0.0554	0.0601	-0.0047	0.9131	0.0554	0.9131
0.0555	0.0602	-0.0047	0.9131	0.0555	0.9131
0.0556	0.0603	-0.0047	0.9131	0.0556	0.9131
0.0557	0.0604	-0.0047	0.9131	0.0557	0.9131
0.0558	0.0605	-0.0047	0.9131	0.0558	0.9131
0.0559	0.0606	-0.0047	0.9131	0.0559	0.9131
0.0560	0.0607	-0.0047	0.9131	0.0560	0.9131
0.0561	0.0608	-0.0047	0.9131	0.0561	0.9131
0.0562	0.0609	-0.0047	0.9131	0.0562	0.9131
0.0563	0.0610	-0.0047	0.9131	0.0563	0.9131
0.0564	0.0611	-0.0047	0.9131	0.0564	0.9131
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0.0570	0.0617	-0.0047	0.9131	0.0570	0.9131
0.0571	0.0618	-0.0047	0.9131	0.0571	0.9131
0.0572	0.0619	-0.0047	0.9131	0.0572	0.9131
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0.0577	0.0624	-0.0047	0.9131	0.0577	0.9131
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0.0592	0.0639	-0.0047	0.9131	0.0592	0.9131
0.0593	0.0640	-0.0047	0.9131	0.0593	0.9131
0.0594	0.0641	-0.0047	0.9131	0.0594	0.9131
0.0595	0.0642	-0.0047	0.9131	0.0595	0.9131
0.0596	0.0643	-0.0047	0.9131	0.0596	0.9131
0.0597	0.0644	-0.0047	0.9131	0.0597	0.9131
0.0598	0.0645	-0.0047	0.9131	0.0598	0.9131
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0.0601	0.0648	-0.0047	0.9131	0.0601	0.9131
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0.0604	0.0651	-0.0047	0.9131	0.0604	0.9131
0.0605	0.0652	-0.0047	0.9131	0.0605	0.9131
0.0606	0.0653	-0.0047	0.9131	0.0606	0.9131
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0.0625	0.0672	-0.0047	0.9131	0.0625	0.9131
0.0626	0.0673	-0.0047	0.9131	0.0626	0.9131
0.0627	0.0674	-0.0047	0.9131	0.0627	0.9131
0.0628	0.0675	-0.0047	0.9131	0.0628	0.9131
0.0629	0.0676	-0.0047	0.9131	0.0629	0.9131
0.0630	0.0677	-0.0047	0.9131	0.0630	0.9131
0.0631	0.0678	-0.0047	0.9131	0.0631	0.9131
0.0632	0.0679	-0.0047	0.9131	0.0632	0.9131
0.0633	0.0680	-0.0047	0.9131	0.0633	0.9131
0.0634	0.0681	-0.0047	0.9131	0.0634	0.9131
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0.0642	0.0689	-0.0047	0.9131	0.0642	0.9131
0.0643	0.0690	-0.0047	0.9131	0.0643	0.9131
0.0644	0.0691	-0.0047	0.9131	0.0644	0.9131
0.0645	0.0692	-0.0047	0.9131	0.0645	0.9131
0.0646	0.0693	-0.0047	0.9131	0.0646	0.9131
0.0647	0.0694	-0.0047	0.9131	0.0647	0.9131
0.0648	0.0695	-0.0047	0.9131	0.0648	0.9131
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0.0653	0.0700	-0.0047	0.9131	0.0653	0.9131
0.0654	0.0701	-0.0047	0.9131	0.0654	0.9131
0.0655	0.0702	-0.0047	0.9131	0.0655	0.9131
0.0656	0.0703	-0.0047	0.9131	0.0656	0.9131
0.0657	0.0704	-0.0047	0.9131	0.0657	0.9131
0.0658	0.0705	-0.0047	0.9131	0.0658	0.9131
0.0659	0.0706	-0.0047	0.9131	0.0659	0.9131
0.0660	0.0707	-0.0047	0.9131	0.0660	0.9131
0.0661	0.0708	-0.0047	0.9131	0.0661	0.9131
0.0662	0.0709	-0.0047	0.9131	0.0662	0.9131
0.0663	0.0710	-0.0047	0.9131	0.0663	0.9131

FREQUENTLY ASKED QUESTIONS

PREREQUISITE



Knowledge of Basic Excel ,
Basic Statistics , Stochastic
Calculus and Financial Products
is must

CERTIFICATE



Silver Certificate on successful
completion of projects .
Gold Certification on passing a
2 hours MCQ based exam.

FEES



Rs.20000

DURATION



50+ hours

ABOUT THE TRAINER



Karan Aggarwal is one of India's leading trainers in Financial Modelling, Risk Modelling, Data Analytics and academic programs like Financial Risk Manager (FRM) & Actuarial Science. He has spearheaded several solution accelerators and spreadsheet-based prototypes in Risk and Analytics space. Karan has also authored a number of books on Advanced Excel, Statistical Modelling, Risk Modelling & Machine Learning. He is widely regarded for his problem-solving, thought leadership and intrapreneurship skills. His analytical mindset, solid fundamentals & the thirst to keep learning set him apart as a true authority in this field. Karan has also been awarded the Young Indian Entrepreneur Award by the Confederation Of Indian Industries in the year 2017.



OUR TRAINEES WORK IN



OUR SERVICES

1



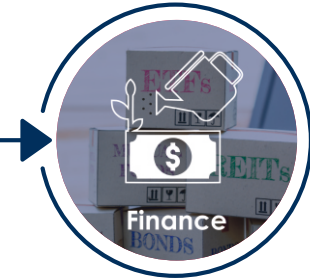
2



3



4



98 74 98 74 98

