CRISIL - Risk & Analytics Overview

September 2017
CRISIL – An Introduction

- **Global Research and Analytics**
  - Ratings
  - Risk Solutions
  - India Research

- **Market Capitalization:** USD 2.3 Billion
  - Strong Financial Profile
  - Zero Debt

**CRISIL Businesses**

- **Risk and Analytics**
  - 17 of 31 BHCs in DFAST/CCAR
  - Built/validated 1,600+ models in 2016
  - Review 20% of outstanding exotic derivatives annually

- **Equity Research**
  - 15 of Top 20 Global Investment Banks
  - 3,300 global stocks under coverage, 450 stocks under small and midcap coverage

- **Credit Risk and Research**
  - 7 of Top 15 Global Banks
  - Track credit quality of 3,400+ credits, 6000+ munis, 80+ sovereigns

- **Coalition**
  - 15 of Top 20 Global Investment Banks
  - Provide deep analytical research on market peers, revenue opp., client wallets and market size

- **Corporate Research**
  - 50 Fortune 500 Companies
  - Provided intelligence on over 11,000 global firms and insights on 70 sectors

**Strong Governance and Compliance Orientation**

- ISO 27001:2013 Certified
- Regulated by SEBI, an SEC-equivalent

**Strongly Performance-Oriented Culture**

- Niches Quantitative and Analytical Talent
- Client Focus and Solution Orientation
Global Footprint and Support by Geography

Research & Analytics Centres
- Buenos Aires, Argentina
- London, UK
- Wroclaw, Poland
- Hangzhou, China
- Paris, France
- Eastern EMEA (~200)
- Americas (~1,250)
- Western Europe (~1,150)
- APAC (~200)
- US (
  - Chicago
  - New York
  - San Francisco
)
- India
  - Chennai
  - Delhi
  - Mumbai
  - Pune
- Buenos Aires, Argentina
- Singapore
- Hong Kong, China

Over 2,800 highly qualified analysts provide round-the-clock support through research centres in Argentina, China, India and Poland.
Some of our Clients in Risk and Analytics
Risk & Regulatory Analytics – Our Services

Model Development
- Development of models across regulatory risk, pricing/valuation, actuarial and finance models
- Pension de-risking and ALM models; actuarial support in ERM and ORSA activities
- High-quality model documentation in line with best in class model risk practices

Model Validation
- Validate regulatory risk models, stress test models, pricing/valuation models, actuarial models and others (accounting/finance etc)
- Challenge model assumptions and highlight limitations
- Perform back-testing and benchmarking
- Adherence to FRB’s SR 11-7 guidelines

Data Analytics
- Financial crime analytics across banking lines/products including AML Transaction monitoring
- Fraud analytics
- Marketing Analytics

Activities
- Model Analysis
- Model Implementation and Integration
- Model Validation/Revalidation
- Model Documentation
- Model Testing
- Performance Monitoring
- Back testing
- Model Recalibration
- Sensitivity Analysis
- Benchmarking
- Building Analytical Libraries and Tools

Actuarial Services
- Support across areas of Life, Pension and P&C in key activities likes
- Pension Admin. and Valuation,
- Asset Liability Modeling
- Enterprise Risk and Stochastic projections
- Pricing and Product Development
- System Migrations

Change Management
- Regulatory Change Management: FRTB, BCBS 239, UMR and IFRS 9
- Business analysis and testing
- Gap & impact analysis of existing processes and new processes
- Implementation of large-scale change programs
- Risk data aggregation
<table>
<thead>
<tr>
<th>CRISIL GR&amp;A’s Risk and Analytics vertical has a deep and diverse talent pool of quants to support all our clients’ needs across model risk management</th>
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<tbody>
<tr>
<td><strong>We have experienced quants analysts with varied experience across Risk &amp; Regulatory projects, Banking analytics, Derivatives pricing and Trading strategies.</strong></td>
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<td><strong>33%</strong> of our quants have 7+ years of experience and <strong>~41%</strong> analysts have 3-7yrs years of experience.</td>
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<td><strong>26%</strong> of our quants are PhDs and <strong>34%</strong> are pursuing or completed specialized professional courses (FIA, FSA, IAI, CFA, CQF, MFE, FRM, ERP).</td>
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<td><strong>31%</strong> of our quants have qualifications from top universities and institutes in the US and UK.</td>
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<td><strong>80%</strong> of our analysts possess a Master’s Degree in a quantitative discipline - Mathematics, Statistics, Physics, Computer Science, Econometrics or Mathematical Finance.</td>
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<td>Our analysts possess experience in various valuation tools (FINCAD, NUMERIX), statistical packages (SAS, R, EVIEWS, MATLAB) &amp; programming languages (C++, Python).</td>
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## Talent: Key Differentiators to Attract Superior Talent

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
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<tbody>
<tr>
<td><strong>Strong Brand Image</strong></td>
<td>• Company of choice of people looking for analytical careers.</td>
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<td><strong>Global Diversity</strong></td>
<td>• 4 research centres across India,</td>
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<td>• 5 strategic international research centres – in USA, UK, Argentina, Poland &amp; China</td>
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<td><strong>Innovation</strong></td>
<td>• CRISIL Certified Analyst Program (CCAP), a work-cum-study programme aimed at developing financial analysts</td>
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<td>• Pioneers in India in building a large talent pool for derivatives, risk and quant roles through our indigenous programmes</td>
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<td><strong>Academia Collaboration</strong></td>
<td>• In India, CRISIL Doctoral Symposium is organized in collaboration with IIM A, B and C</td>
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<td>• In India we conduct on-campus hiring for Actuarial Talent and expose our nurturing environment and actuarial policy</td>
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<td>• In India, CRISIL Young Thought Leader (CYTL) is a competition to promote and recognize young thought leaders in university campuses</td>
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<td>• In Poland, our quant course is a part of the Wroclaw University’s curriculum</td>
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<td>• In Argentina and China, we conduct training programmes and workshops in universities</td>
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<td><strong>Unmatched Career Opportunities</strong></td>
<td>• CRISIL’s multiple business units provide a variety of opportunities for its rich and diverse talent pool</td>
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<td>• 5% of the global headcount is rotated every year across businesses</td>
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**Winner of the Exemplary Talent Practices Award for “Talent Attraction”**
## Strong Campus Recruitment Program

Select Institutions that CRISIL GR&A Recruits from…

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<th>Institution Name</th>
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<tr>
<td>ISI Kolkata</td>
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<td>Indira Gandhi</td>
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<tr>
<td>Delhi School of Economics</td>
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<td>Institute of Developmental Research, Mumbai</td>
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<tr>
<td>IIM Ahmedabad</td>
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<td>Madras School of Economics</td>
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<tr>
<td>IIT Guwahati</td>
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<td>IIM Bangalore</td>
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<tr>
<td>Universidad de Buenos Aires</td>
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<td>Universidad de CEMA</td>
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<td>Universidad de San Andreas</td>
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<td>Universidad de La Plata</td>
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<tr>
<td>Universidad de San Andreas</td>
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<td>Chennai Mathematical Institute</td>
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<tr>
<td>Institute of Mathematical Sciences, Chennai</td>
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<td>IIM Kolkata</td>
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<tr>
<td>Institute of Mathematical Sciences, Chennai</td>
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<td>University of Wroclaw</td>
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<tr>
<td>Wroclaw University of Technology</td>
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<td>Tata Institute of Fundamental Research, Mumbai</td>
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<td>Instituto de Investigaciones</td>
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# In-house Training – Sample Modules

## Modeling Lifecycle & Process
- Model development lifecycle
- Different types of models and model risk
- Model validation process (as per SR 11/7 guidelines)
- Role and scope of model validation team
- Understanding model health statistics
- Benchmark & challenger models
- Documentation & validation reports

## Credit Risk
- Approaches to measure credit risk
- PD, LGD and EAD Models
- Credit scorecard models
- Exposure to products e.g. HELOC, CRE etc
- Handling low default portfolios
- CCR – capital charges CVA and DVA
- Multi factor models incl. inter asset correlations

## Techniques & Methodologies
- Probabilistic approaches
- Monte Carlo simulations
- Maximum likelihood, GMM techniques
- Logistic and Fractional Logistic regression models
- Cash flow simulation
- Time Series Modeling
- Machine Learning (ANN, SVM, RF)
- Factor analysis, PCA, Kalman Filters

## Regulatory Framework
- Introduction to BCBS & Basel Accords
- Calculating RWA and CAR
- Capital Buffers and Liquidity Ratios
- Counterparty Credit Risk Framework
- Basel III Implementation and Challenges
- Introduction to CCAR / stress testing

## Other Sample Modules
- Bloomberg
- Python/C++
- SAS – Basic & Advanced
- Advanced Excel/VBA
- Introduction to R
- Option Pricing
- Securitized Products
- Interest Rate Derivatives
- Stochastic Calculus
- Numerical Methods
- Market Risk Modeling
- Data Mining
- Effective Report Writing
- Effective Communication
- Product Control

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**Global Research & Analytics**

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Thank You
About CRISIL
CRISIL is a global analytical company providing ratings, research, and risk and policy advisory services. We are India's leading ratings agency. We are also the foremost provider of high-end research to the world's largest banks and leading corporations.

CRISIL is majority owned by S&P Global Inc., a leading provider of transparent and independent ratings, benchmarks, analytics and data to the capital and commodity markets worldwide.

About CRISIL Global Research & Analytics
CRISIL Global Research & Analytics (GR&A) is the world's largest and top-ranked provider of high-end research and analytics services. We are the world's largest provider of equity and credit research services. We are also the foremost provider of end-to-end risk and analytics services to trading and risk management functions at world's leading financial institutions and corporations. We offer corporate strategy, competitive intelligence and key account management support to corporations globally. We operate from research centers in Argentina, China, India and Poland, working with our clients across several time zones and in multiple languages. We are proud to be an organization that has the vision to proactively invest in its people and get them future-ready. We are committed to delivering cutting-edge analysis, opinions, and solutions. This underscores our proposition of “Making Markets Function Better”.

Global Research & Analytics