

Financial Statistics & Risk Management Master's Degree Program

A Brief Overview

Definition of financial statistics:

- Application of statistical methods to analyze financial markets data including use of:
 - informal, often graphical, analysis and data visualization techniques
 - formal methods, such as estimation and testing, based on statistical inference
 - advanced statistical techniques including ARIMA models, regression, multivariate models, copulas, GARCH models, factor models, co-integration, Bayesian statistics, nonparametric regression, state space models and advanced filtering methods.

Risk depends on the probability distribution of a return:

- calculate, manage, mitigate and monitor credit, market, operational and other types of risk probability loss distributions and exposures
- calculate optimal levels of hedged exposures and risk transfers
- perform scenario analysis and stress testing of banks' ability to absorb and survive low probability, large impact events
- calculate regulatory and economic capital requirements

Beyond Risk Management

Other applications of statistics in finance include:

- Identifying trading and investment opportunities resulting from market arbitrage conditions or macro-economic imbalances or trends
- Selecting and optimizing investment portfolios
- Calibrating derivative pricing models
- Forecasting and modeling drivers of market trends and growth
- Creating internal credit scoring and rating tools

Traditional Quantitative Finance focuses on complex mathematical modeling for developing and pricing custom derivative products.

FSRM encompasses financial engineering concepts such as no-arbitrage pricing and risk neutral probabilities but emphasizes statistical and data analytics such as:

- measuring, monitoring, managing and mitigating uncertainty, risk and volatility
- optimizing asset weights for portfolio selection
- modeling market trends
- extracting meaningful information from huge volumes of financial data and making it actionable

FSRM students learn the following skills, among others:

- parametric/non-parametric statistical methods
- advanced regression and time series analysis
- data mining/visualization, predictive analytics
- simulation and computational tools
- the statistics and probability tools of risk management
 - default probability and loss-given-default distributions
 - scenario analysis, simulations and stress testing
 - GARCH, copulas and other tools for correlation estimation
 - VaR, CVaR and Expected Loss measures
 - Estimating and simulating event driven loss distributions

Fall Semester, Year 1

- Methods and Theory of Probability with Financial Applications
- Regression Analysis in Finance
- Foundations of Financial Statistics and Risk Management
- Advanced Programming for Financial Statistics and Risk Management

Spring Semester, Year 1

- Methods of Statistical Inference with Financial Applications
- Financial Time Series Analysis
- Advanced Statistical Methods in Finance
- Advanced Simulation Methods for Financial Applications

Fall Semester, Year 2

- Financial Data Mining
- Financial Risk Evaluation and Management

FSRM develops work ready students:

- Advisory Board: tap into the knowledge of senior executives from financial institutions and academicians
- Practitioner's Seminar and Practitioner as Instructor: experienced professionals give talks and teach selected topics
- Summer and final semester internships
- Project work experience
- Prepare for Global Association of Risk Professionals (GARP) Financial Risk Manager (FRM) Certification Exams in parallel with degree
- Career development training

Some institutions where students and graduates have obtained positions:

- Deutsche Bank
- Global Risk Management Advisors
- Capital One
- Cantor Fitzgerald
- GSB Podium Advisors
- ConvergEX Group
- Hewlett Packard
- The Federal Reserve
- Office of Management and Budget – NYC

What you need to apply:

- Official transcripts
- Three letters of recommendation
- Personal statement
- GRE or GMAT test scores
- TOEFL or IELTS test scores (international students)

Rutgers University's pedigree:

- Chartered in 1766; eighth oldest university in the U.S.
- Largest university in NJ
- 280+ undergraduate, graduate and professional degree programs across 175 academic departments
- Nearly 40,000 students
- 40 miles from New York City

Rutgers, The State University of New Jersey
Financial Statistics and Risk Management Program
110 Frelinghuysen road
Piscataway, NJ 08854

tel: 848-445-8000

email: fsrm@stat.rutgers.edu

To learn more, please visit www.fsrm.rutgers.edu