

# FRANCISCO RUBIO, PHD

Assistant Vice President of Technology | Quant Developer | Financial Modeling

Relocating to Los Angeles | Summer 2024

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## SKILLS

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- Programming Languages: Python, Dash, MS Excel VBA, SAS | Databases Management: SQL Server, SSMS
- Cloud: Git, Azure DevOps, Basic knowledge of CI/CD deployment using Kubernetes (K8s)
- Certifications: CFA Level 1, 2018; CFA Level II, 2019, CFA Level III, August 2024 (registered)

## EDUCATION

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### NEW YORK UNIVERSITY, TANDON SCHOOL OF ENGINEERING

Brooklyn, NY

Master of Science in Financial Engineering, GPA: 3.8/4.0

12/20

### UNIVERSITY OF NEW ORLEANS

New Orleans, LA

Ph.D. in Financial Economics, GPA: 3.5/4.0

12/13

Bachelor of Science in Business Administration with Computer Science

05/09

Bachelor of Science in Management, Dual Major, GPA: 3.5/4.0 – *Cum Laude*

## PROFESSIONAL EXPERIENCE

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### STONEX GROUP INC, New York, NY

Assistant Vice President – Fixed Income Technologies - Quant Developer

4/20 - Present

Fixed Income Sales and Trading Intern

- Spearheaded the development of statistical models for fixed-income trading, enhancing decision-making through advanced scripting and data visualization techniques.
- Designed and implemented a series of in-house standard template libraries that facilitate the deployment of web-based Plotly Dash applications, including a base dashboard app, bundle component creations, and Plotly graph templates; managed the necessary CD/CI pipelines and orchestrations through Azure DevOps.
- Successfully optimized the data management process of various disclosure data files through effective data wrangling, enabling rapid, on-the-fly access and analysis, especially for our in-house dash applications.
- Developed and optimized SQL queries for traders, enabling efficient data retrieval from internal databases; implemented automated stored procedures and functions to enhance data processing speed and accuracy.
- Implemented advanced regression analysis techniques including LASSO, VAR, and Panel specifications in predictive modeling.
- Applied machine learning/NLP algorithms for improving the automation of parsing PDF, Excel, and text files.

#### Notable projects:

##### *Fixed Income Regression Environment*

- Developed an interactive dashboard designed to display time-series and scatterplot graphics, integrating data from diverse sources, spanning across various asset classes for the different fixed income products.
- Enhanced the dashboard with features to present the distribution moments, along with standard moving averages, trends, Bollinger bands, among other statistical analysis.
- Incorporated Ordinary Least Squares (OLS) regression tools to assist sales and trading groups in identifying potential correlations and patterns across various product types. Enhanced this feature by allowing regressions to be aligned with distinct time periods, accentuating shifts in trends.

##### *CMBS Agency Prepayment Analyzer*

- Designed and developed a user-friendly dashboard for creating cohorts of Agency CMBS pools/loans, enabling prepayment speed calculations, cohort comparisons, statistical analysis, and dynamic visualization.
- Developed in-house libraries for efficient data wrangling and database management, crucial for maintaining our Agency CMBS pool and loan-level data supporting the dashboard.
- Built the required Python backend that calculates CPR, SMM, WALA, WAM, and Default Probabilities.
- Developed a linearization algorithm to smooth the CPR time-series, utilizing high-watermark peaks and valleys based on a rolling window. This algorithm features adjustable parameters to control the smoothness factor and calibrate the rolling window according to the user desired specifications.

### *Convertible Bonds Order Management System*

- Developed a system for convertible bond order management that dynamically adjusts delta-neutral stock quantities based on bond orders and directs equity and bond orders for execution in the appropriate OMS.
- The system updates the delta-neutral bond pricing following equity executions automatically.
- Integrated analytical tools for monitoring current positions, performing linear trend analysis, calculating delta-neutral pricing according to live market data, and track complete trading history.
- Added a regression analysis feature that enables traders to swiftly assess whether bonds have cheapened/enriched relative to in-house trades, street/active orders, and TRACE reported trades.

### *Fixed Income Risk Modeling*

- Prototyped an interactive dashboard to monitor interest rate risk exposure across various fixed income trading books, enhancing risk management capabilities for trading desks.
- Calculated the partial durations for the different mortgage products.
- Calculated prepayment probabilities for mortgages based on a pool of similar assets.

### *Short-term Treasuries Predictive Algo/Model*

- Designed a dynamic regression-based model for predicting current price expectations for short term treasuries based on neighboring bills and short-term coupon treasuries,
- Selected the most efficient set of neighboring treasuries (regressors) via Lasso regression with dynamic penalties; the LASSO model was specified to take the maximum penalty that guaranteed at least 3 regressors.
- Backtested several model specifications including Vector Autoregression (VAR) and a multivariate OLS; ultimately chose the VAR specification as it better characterizes the interdependencies between time-series.

### General functions as team leader:

- Led the intern recruitment and retention efforts, actively participating in the interview process to select the most promising candidates.
- Conducted performance evaluations for interns, offering targeted constructive feedback, identifying opportunities for development, and making informed hiring recommendations.
- Oversaw code review and approval processes across all repositories, ensuring code quality and adherence to best practices.
- Mentored interns in developing production-grade code, resulting in multiple stored procedures and modules being upgraded and integrated into the live environment.

## **ACADEMIC EXPERIENCE**

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### **NEW YORK UNIVERSITY**, New York, NY

*Adjunct Professor – Finance and Risk Engineering Department*

6/21 – Present

- Classes: Advanced Topics in Financial Technology (advanced visualization in financial engineering).
- Mentoring: Financial Engineering Capstone Projects (advising).

### **UNIVERSITY OF HOLY CROSS**, New Orleans, LA (08/17 – 05/19)

*Associate Professor of Finance*

- Taught Foundations of Economics, Principles of Macroeconomics and Microeconomics, Managerial Finance, and Applied Business Statistics (Undergraduate), and Finance for Decision Making, and Corporate Finance (Graduate).

### **CENTRAL CONNECTICUT STATE UNIVERSITY**, New Britain, CT (08/13 - 07/17)

*Associate Professor of Finance*

- Taught Principles of Financial Management, Security Analysis, Foundations of Economics, Principles of Macroeconomics, Principles of Microeconomics, Managerial Finance, and Applied Business Statistics (Undergraduate), and Finance for Decision Making, and Corporate Finance (Graduate).

## **HONORS / AWARDS / EXTRACURRICULAR ACTIVITIES**

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- Top Graduate Business Administration with Computer Science Option
- Member of the Latin American Association, Central Connecticut State University
- Karting enthusiast