



Ph.D. Dissertation Defense

Candidate:	Francesco A. Fabozzi
Degree:	Doctor of Philosophy
School/Department.:	Interdisciplinary / Data Science
Date:	Thursday, May 2, 2024
Time:	12:00 – 1:30 pm
Location:	Babbio 601
Title:	A New Framework for the Application of Generative Language Models for Portfolio Construction
Chairperson:	Dr. Ionut Florescu, Financial Engineering, School of Business
Committee Members:	Dr. Steve Yang, Financial Engineering, School of Business Dr. Majeed Simaan, Financial Engineering, School of Business Dr. Jia Xu, Computer Science, School of Engineering and Science Dr. Petter Kolm, Mathematical Finance, NYU Courant

Abstract

Generative language models (GLMs) represent a new class of large language models (LLMs) that specialize in generating text. As such, these models present new opportunities in finance due to their ability to generalize learned knowledge through conversational dialog without explicit training. While this ability expands the range of applications of LLMs for finance, text-based outputs are ill-suited for traditional cross-sectional portfolio construction methods, which rely on the ability to rank expected return forecasts for portfolio selection.

We present a novel framework for the application of GLMs to cross-sectional portfolio construction. Specifically, we introduce a new technique, logit extraction, which extracts fine-grained measures of GLM sentiment derived from next-token prediction probabilities. Logit extraction produces sentiment label probabilities that are extracted from conversational models, allowing for the formulation of continuous-valued expected return forecasts that are better-suited for traditional portfolio construction strategies. Additionally, logit extraction allows GLMs to be trained in a conversational style, which best leverages their pre-training. We show that logit extraction significantly enhances risk-adjusted returns and enables conversational fine-tuning styles that offer significant improvements over traditional approaches.