



THE UNIVERSITY OF
CHICAGO

DEPARTMENT OF STATISTICS

Master's Thesis Presentation

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“Task-Aligned Factors: Supervised Autoencoders for CPI Forecasting
and Futures Cross-Sections”

November 13, 2025, at 10:00 AM
Jones 111, 5747 S. Ellis Avenue

Abstract

Autoencoders are neural networks widely used for unsupervised tasks such as dimensionality reduction and feature extraction. This thesis studies a supervised autoencoder that is trained not just to compress panels of macro and asset-pricing signals, but to forecast them in real time, and evaluates its economic value in two canonical empirical settings: disaggregated U.S. inflation forecasting and cross-sectional commodity futures return prediction using portfolio-style tests common in asset pricing. The supervised autoencoder improves forecast accuracy for CPI subcomponents and aggregated headline inflation, and delivers higher risk-adjusted long–short performance than principal component, tree-based, and linear shrinkage benchmarks in several specifications, while still respecting strict rolling, no-look-ahead evaluation.