Deep Learning, Predictability, and Optimal Portfolio Returns*

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Abstract

We study dynamic portfolio choice of a long-horizon investor who uses deep learning methods to predict equity returns when forming optimal portfolios. Our results show statistically and economically significant benefits from using deep learning to form optimal portfolios through certainty equivalent returns and Sharpe ratios. Return predictability via deep learning also generates substantially improved portfolio performance across different subsamples, particularly during recessionary periods. These gains are robust to including transaction costs, short-selling and borrowing constraints.

Keywords: Return Predictability, Portfolio Allocation, Machine Learning, Neural Networks, Empirical Asset Pricing

JEL codes: C45, C53, E37, G11, G17

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