Siddhartha Lewis-Hayre

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EDUCATION

Yale University, New Haven, CT 2018-2022
B.S. Mathematics with Distinction (3.8 GPA)

Hopkins High School, New Haven, CT 2016-2018
Princeton Book Award Recipient

RELEVANT COURSEWORK

Yale University: General Economic Theory: Microeconomics I & II (PhD), General Equilibrium Theory, Mathematical Game Theory, Econometrics, Introduction to Probability and Statistics, Introduction to Functional Analysis, Measure Theory and Integration, Introduction to Abstract Algebra, and Real Analysis

George Washington University: Macroeconomic Theory I & II (PhD)

RESEARCH

Research Interests
Industrial Organization, Finance, and International Trade

Research

- Preparing for Industrial Shortages
- Production Decisions Under Shortages
- A Heuristic for the Network Design Problem with Steiner Points *(Senior Thesis)*
    - Advised by Prof. Aleh Tsyvinski (Yale Economics) and Prof. Richard Kenyon (Yale Mathematics)

Work In Progress

- Bank Lending to Private Credit *(FEDS Note)*
    - With Jose Berrospide, Fang Cai, and Filip Zikes

Research Assistance

- Auto Finance in the Electric Vehicle Transition *(Working Paper)*
    - Elizabeth Klee, Adair Morse, and Chaehee Shin
- Settlement Speed in Payment Systems *(Work in Progress)*
    - Agostino Capponi, and Jin-Wook Chang
- Collateralized Debt Networks with Lender Default *(Revision)*
    - Jin-Wook Chang
- Climate Risk Networks and Banks' Exposures *(Work in Progress)*
    - Celso Brunetti, Benjamin Dennis, Gurubala Kotta, Caroline Norris, Chaehee Shin, and Ilknur Zer

COMPUTER SKILLS AND LANGUAGES

- Programming Languages: Python, STATA, SQL, R, C, and Racket
- Python Libraries: Pandas, Numpy, Matplotlib, Scipy, Sklearn, TensorFlow, PyTorch
- Programming Skills: Git, Bash, VS Code
- Advanced Spanish

EXPERIENCE

Board of Governors of the Federal Reserve (Senior Research Assistant) 2023-Present

- Worked on Klee, Morse, Shin (2024), Auto Finance in the Electric Vehicle Transition
    - Implemented various empirical estimators including Borusyak, Hull, and Jaravel (2021)
    - Pulled, cleaned, and analyzed SEC's ABS-EE loan-level data
    - Created loan performance metrics by analyzing monthly cash flows
    - Studied automobile asset-backed securities and programmed payment waterfall yielding z-spreads
- Researched private credit and its potential risks to financial stability
    - Studied bank involvement in private credit and writing FEDS note with Berrospide, Cai, and Zikes
    - Wrote monthly news memos to Financial Stability Divisions' Officers and Section Chiefs
    - Created and analyzed novel datasets using advanced programming techniques
- Contributed to Financial Stability Report and monitoring of asset managers' financial stability risks
- Presented to Financial Stability Division code I developed to streamline research projects

Ellington Management Group (Research Analyst) 2022-2023

- Used machine learning (ML) and artificial intelligence (AI) to train credit risk models for debt instruments
- Built risk model for Credit Risk Transfers and presented it to CEO and leadership
- Developed leverage loan risk model using clustering and neural networks
- Worked with AI specialist on training random forest for CLO risk model
- Studied firm's strategy for hedging systematic risk by simulating different hedging strategies

Ellington Management Group (Summer Analyst) Summer 2021

- Researched how much cash to save as "dry powder" for investment opportunities
- Created mathematical framework to determine when to take opportunities and wrote paper on findings

Ross' Recovery Theorem Research Seminar Spring 2021

- Worked with Professor John Geanakoplos and five other Yale Undergraduates
- Studied Perron-Frobenius Theorem and applied Ross' Recovery Theorem to options data

Polymath REU Program (Research Experiences for Undergraduates) Summer 2020

- Researched an open question in graph theory with Yale's Gibbs Assistant Professor Patrick Devlin

Alexis Prep 2020-2021

- Tutored primary and secondary school students in mathematics, economics, and SAT preparation