Application: NBER Digital Economics and AI Tutorial

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Graduate Study History

I am a third-year PhD student in Economics at the University of Virginia (enrolled 2023–Present). My primary fields are **Macroeconomics** and **International Finance**.

Coursework: During my first year, I completed the core sequence in microeconomics, macroeconomics, and econometrics. In my second year, I specialized in Advanced Macroeconomics, International Finance, International Trade, and Numerical Methods. I also founded and led the UVA Graduate Econometrics Workshop, focusing on topics such as Instrumental Variables. To deepen my understanding of macro-finance linkages, I attended the *Princeton Initiative: Macro, Money & Finance* and the *Bendheim Center for Finance Summer School* (Summer 2025).

Pre-PhD Context: Before my doctoral studies, I worked as an ODI Fellow (Economist) at the Ministry of Finance of Guyana, where I managed the fiscal strategy following a major oil discovery. I also possess several years of experience in applied microeconomics research, which provided me with rigorous training in causal inference. This background – managing real-world fiscal risks combined with identification skills – directly motivates my current research agenda: bridging micro-foundations with aggregate macroeconomic questions.

Research Interests & Projects

Research Focus: My research sits at the intersection of **International Finance, Fiscal Policy, and Digital Macroeconomics**. I am interested in how governments manage aggregate risks and uncertainty; specifically, how the AI technological revolution acts as a supply-side shock that alters labor shares, fiscal sustainability, and international risk-sharing.

While digital economics often focuses on firm-level adoption, I aim to fill the "Macro Gap" by treating Data, AI, and Compute as aggregate factors of production that shift comparative advantage and necessitate new fiscal architectures.

Research in Progress

1. AI Risk-Sharing through Fiscal Policy

(Joint with Anton Korinek)

Status: In Progress

This project analyzes optimal risk-sharing in the face of "transformative uncertainty," specifically regarding the future factor shares of labor and capital. We model households as holding an implicit portfolio of human and physical capital, with AI representing a shock that drastically alters the covariance of returns between these assets.

The core of the paper establishes theoretical equivalence results between distinct hedging mechanisms. We demonstrate conditions under which government equity stakes (Sovereign Wealth Funds), distributed private equity stakes (Universal Basic Capital), and capital taxation (including contingent taxation such as the "Windfall Clause") are isomorphic tools for insuring citizens against factor-share shifts.

We then relax these conditions to explore implementation limits. We analyze how agency costs, control rights (inside vs. outside equity), and the geographic scope of capital (global vs. domestic) break these equivalences. This decomposition allows us to characterize the optimal policy mix for financing a safety net in an economy where the returns to intelligence are increasingly capitalized.

2. Stabilizing Commodity-Exporting Small Open Economies via Fiscal Policy

(Solo Authored)

Status: Working Paper

Commodity-Exporting Small Open Economies (SOEs) are vulnerable to exogenous price cycles and volatility. I develop a DSGE model to determine the optimal fiscal portfolio allocation for such economies. Specifically, I study how the government can optimally hold foreign equity (via Sovereign Wealth Funds) and manage the currency composition of its debt to hedge against macro-financial shocks. I calibrate the model to Norway to obtain quantitative guidance.

Relevance to Digital Economics: **I am currently extending this framework to treat "Data Centers" and "Compute" as the new commodity**. Just as oil-rich nations manage volatility, economies that export compute face specific energy-intensity and revenue-volatility risks. This project aims to model the optimal fiscal hedging strategy for the "Compute-Exporting" economy.

3. CIP Deviations and International Asset Allocation

(Joint with Chang He)

Status: Data Analysis

We investigate how financial frictions, specifically deviations from Covered Interest Parity (CIP), distort the international distribution of capital. Using a global dataset on bilateral investment positions, capital taxation, and geopolitical distances, we estimate a gravity-based framework to quantify how limits to arbitrage drive global capital misallocation.

Relevance to Digital Economics: This project establishes an empirical baseline for the efficiency of the current analog financial system. By quantifying the "cost of verification" (via CIP deviations), we provide a benchmark to evaluate the potential efficiency gains of digital settlement layers (e.g., Stablecoins, CBDCs) that promise to eliminate some of these arbitrage limits.

Proposed Dissertation Framework

As a third-year student, I am currently formalizing my dissertation prospectus.

Working Title: Essays on International Risk Sharing and Sovereign Asset Management

Description: My dissertation investigates the optimal composition of sovereign balance sheets in the presence of large macro-financial shocks. I analyze how governments can utilize fiscal and financial instruments, from sovereign wealth funds to contingent claims, to hedge against aggregate risks, ranging from commodity price volatility to AI technological transition.

Principal Advisors:

- **Anton Korinek** (Department of Economics, UVA)
- **Eric Van Wincoop** (Department of Economics, UVA)
- **Eric Young** (Department of Economics, UVA)