Tianyu Fan

Address: Department of Economics
Yale University
New Haven, CT 06520-8268

Telephone: +1 2035066308

E-mail: tianyu.fan@yale.edu

Web page: tianyu-fan.com

Citizenship: China

Fields of Concentration:
Primary Field: Macroeconomics
Secondary Field: International Trade

Qualifying Examinations Completed
2022 (Oral): Macroeconomics, International Trade
2021 (Written): Microeconomics; 2020 (Written): Macroeconomics (pre-entry)

Dissertation Title: *Essays in Macroeconomics*

Committee:
Professor Michael Peters (Co-Chair)
Professor Fabrizio Zilibotti (Co-Chair)
Professor Pascual Restrepo

Education:
Ph.D., Economics, Yale University, 2026 (expected)
M.Phil., Economics, Yale University, 2023
M.A., Economics, Yale University, 2022
M.A., International and Development Economics, Yale University, 2019
B.A., Economics, Peking University, 2018
B.A., Law, China University of Political Science and Law, 2018

Fellowships, Honors and Awards:
Ph.D. Dissertation Fellowship, Federal Reserve Bank of St. Louis, 2025
Stripe Economics of AI Fellowship, Stripe, 2025
The Sylff Fellowship, Yale University, 2023
Carl Arvid Anderson Prize Fellowship, Yale University, 2023
Doctoral Fellowship, Cowles Foundation Fellowship, Yale University, 2020 - 2026

Teaching Experience:

Fall 2024, Teaching Assistant to Pascual Restrepo and Fabrizio Zilibotti, Macroeconomics (PhD), Yale University

Fall 2023, Teaching Assistant to Zhen Huo and Fabrizio Zilibotti, Macroeconomics (PhD), Yale University

Spring 2023, Teaching Assistant to Michael Boozer, Advanced Development (Master), Yale University

Fall 2022, Teaching Assistant to Ana Cecilia Fieler, Growth and Macroeconomics (Master), Yale University

Fall 2017, Teaching Assistant to Ju Hu and Lixing Li, Intermediate Microeconomics (Undergraduate), Peking University

Research Experience:

Pre-doc Research Assistant to Prof. Fabrizio Zilibotti, Yale University, 2019-2020

Publications:

"Growing Like India: The Unequal Effects of Service-Led Growth" (2023) [with Michael Peters and Fabrizio Zilibotti], *Econometrica,* Vol 91, No 4.

Working Papers:

"The Labor Market Incidence of New Technologies" (April 2025), *Job Market Paper*

"The Geopolitical Determinants of Economic Growth, 1960-2019" (July 2025)

"Geopolitical Barriers to Globalization" (September 2025), with Mai Wo and Wei Xiang

Work In Progress:

"Partial Automation", with Pascual Restrepo

"Anatomy of Geopolitical Dynamics", with Jizhou Liu and Wei Xiang

"Measuring Inflation Inequality with Incomplete Prices", with Olivia Ding and Kan Yao

Seminar and Conference Presentations (reverse chronological order):

2025: NEUDC 2025 (Tufts), Peking University, The University of Hong Kong, Pan-Asian Macro/Finance Seminar, Growth and Development Conference (Minneapolis Fed), St. Louis Fed Dissertation Conference, CCER Summer Institute, Growth and Institution Conference (Tsinghua), CUFE

2024: The TRAIN Conference (Beijing)

2023: Peking University

Referee Service:

American Economic Review: Insight, Journal of Comparative Economics, Macroeconomic Dynamics

Languages:

Chinese (native), English

References:

Prof. Michael Peters
Yale University
Department of Economics
New Haven, CT 06520
Phone: 203-436-8475
m.peters@yale.edu

Prof. Fabrizio Zilibotti
Yale University
Department of Economics
New Haven, CT 06520
Phone: 203-432-9561
fabrizio.zilibotti@yale.edu

Prof. Pascual Restrepo
Yale University
Department of Economics
New Haven, CT 06520
Phone: 203-432-3576
pascual.restrepo@yale.edu

Dissertation Abstract

Through both theoretical modeling and empirical analysis, my work investigates how technological progress, geopolitical forces, and structural transformation shape economic outcomes across countries and within societies.

The Labor Market Incidence of New Technologies [Job Market Paper]

This paper introduces a new framework to analyze how technological shocks such as automation and Artificial Intelligence reshape labor markets and wage inequality. The challenge to workers is that automation and AI do not strike randomly: they cluster in skill-adjacent jobs, limiting mobility and amplifying inequality. To capture this mechanism, I propose a Roy model with latent skills, which formalizes that workers transition more easily between jobs requiring similar skills. My theory highlights how clustered technological shocks restrict reallocation opportunities and magnify wage disparities, offering a framework for evaluating the distributional consequences of technological change at a granular occupational level.

Central to my model is the concept of distance-dependent elasticity of substitution (DIDES), embedding the idea that worker substitutability between jobs declines with their distance in the low-dimensional skill space. The key innovation is that productivity draws are correlated within skill-similar occupations, generating realistic substitution patterns: high mobility within clusters but limited mobility across them. The main contribution of my approach is that it allows for rich granularity in the occupational space while remaining empirically tractable. I achieve this by mapping 300+ occupations into a three-dimensional skill space (cognitive, manual, interpersonal) using O*NET data, where proximity determines substitutability. Crucially, the structural estimation requires only standard aggregate data—occupational employment shares and average wage changes. The estimation reveals that, in response to automation shocks between 1980 and 2010, approximately two-thirds of worker substitution occurs within skill clusters rather than across them, with cognitive skills proving most transferable and manual skills least portable.

With the estimated labor supply elasticities at hand, I compute the unequal effects of technological shocks at the occupation level. For automation, which has affected labor markets since the 1980s, I find that its concentration in manual-intensive occupations severely constrains

worker mobility: 40% of labor demand changes translate into wage adjustments (versus 30% under CES or Nested-CES frameworks), while workers recover only 20% of wage losses through occupational transitions (versus 35% predicted by CES/Nested-CES models). The estimated model also allows me to predict the incidence of shocks that have not fully materialized yet. I find that AI threatens cognitively-intensive occupations with similar clustering patterns but in the opposite skill domain compared to automation. Under counterfactual AI adoption scenarios, the model predicts limited employment reallocation with large wage adjustments, creating substantial wage disparities between AI-exposed and unexposed occupations. These findings demonstrate that technological clustering, combined with skill-based mobility constraints, fundamentally shapes distributional consequences, generating more severe and persistent inequality than standard frameworks predict.

The Geopolitical Determinants of Economic Growth, 1960-2019

How does geopolitical alignment—the state of a country's diplomatic and strategic relationships with major powers—shape economic growth? I construct a novel event-based measure of bilateral geopolitical relations by employing large language models with web search capabilities to analyze over 440,000 political events across 196 countries from 1960–2019. This comprehensive measure enables identification of the precise timing and magnitude of geopolitical shifts within countries over time. Using local projections with country fixed effects, I find that a one-standard-deviation improvement in geopolitical relations increases GDP per capita by approximately 10% over 25 years. These persistent effects operate through multiple reinforcing channels—enhanced political stability, increased investment, expanded trade, and productivity gains. Across the sample, geopolitical factors generate GDP variations ranging from −35% to +30% across countries and over time, with developing nations facing particularly severe penalties from international isolation.

Geopolitical Barriers to Globalization, with Mai Wo and Wei Xiang

This paper estimates and quantifies how geopolitical alignment shapes global trade across three distinct eras: the Cold War, hyper-globalization, and contemporary fragmentation. We construct a novel measure of bilateral alignment using large language models to compile and analyze 833,485 political events spanning 193 countries from 1950 to 2024. Our analysis reveals that trade flows systematically track geopolitical alignment in both bilateral relationships and aggregate patterns. Using local projections within a gravity framework, we estimate that a one-standard-deviation improvement in geopolitical alignment increases bilateral trade by 20 percent over ten years. Integrating these elasticities into a quantitative general equilibrium model, we find that deteriorating geopolitical relations have reduced global trade by 7 percentage points between 1995 and 2020. Our findings provide empirical benchmarks for evaluating the costs of geopolitical fragmentation in an era of renewed great power competition.

Measuring Inflation Inequality with Incomplete Prices, with Olivia Ding and Kan Yao

Poor U.S. households have faced higher inflation rates than rich households over the last four decades, but do unmeasured quality improvements offset this inequality? This paper develops a novel Engel curve approach to measure inflation inequality when official prices incompletely capture quality changes. Given price and income elasticities, variation in expenditure shares is sufficient to estimate inequality from unobserved quality improvements. Income elasticities are recovered from covariation between expenditure shares and household income, while price elasticities are estimated from covariation between expenditure shares and prices, using a latent separability structure with cost shifters as instruments. Applying this method to U.S. data (1984-2019), we find that unmeasured quality improvements exacerbate observed inflation inequality, implying official statistics understate inflation's regressivity.

[Growing Like India: The Unequal Effects of Service-Led Growth](#), with Michael Peters and Fabrizio Zilibotti, *Econometrica* 2023

Structural transformation in most currently developing countries takes the form of a rapid rise in services but limited industrialization. In this paper, we propose a new methodology to structurally estimate productivity growth in service industries that circumvents the notorious difficulties in measuring quality improvements. In our theory, the expansion of the service sector is both a consequence---due to income effects---and a cause--- due to productivity growth--- of the development process. We estimate the model using Indian household data. We find that productivity growth in non-tradable consumer services such as retail, restaurants, or residential real estate, was an important driver of structural transformation and rising living standards between 1987 and 2011. However, the welfare gains were heavily skewed toward high-income urban dwellers.