Peilin Yang

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Stanford University, *Graduate School of Business*
Predoctoral Research Fellow

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Current Position

2021-Presented	Predoctoral Research Fellow, Stanford University, *Graduate School of Business*
	In finance group

Education

2017-2021	B.A. in Economics, Nankai University, *School of Finance*
	With Highest Honor of College
	With Highest Honor in Thesis
	Thesis: <u>Rare Disaster Element in HANK</u>

Publications

1. "Numerical solution and parameter estimation for uncertain SIR model with application to COVID-19 pandemic." With Xiaowei Chen, Jing Li, Chen Xiao. 2020. *Fuzzy Optimization and Decision Making.*

Working Papers

1. "Transmission Channels of Fiscal Policy at ZLB." Peilin Yang. 2020. [link]
   https://tteclinc.github.io/peilinyang//files/HANK.pdf
   In the era of crisis (e.g. COVID-19), zero lower bound (ZLB) on nominal interest rates tend to bind, and monetary policy cannot provide appropriate stimulus. Fiscal policy is an appropriate stabilization tool at the ZLB. I build an analytical TANK model to understand how the fiscal policy tool will be transmitted to the agents. Consumption taxes and labor taxes replicate the effects of monetary policy through the intertemporal substitution channel. Debt-financed lumpsum transfers and a permanent increase in the government debt level replicate the effects of monetary policy through the redistribution channel. And I explore how to replicate similar results in the mechanism in the HANK framework.

2. "Online and Offline Industrial Structure Dynamics in COVID-19". 2020.
   Submit to SIAM Journal on Control and Optimization. [link]
   https://tteclinc.github.io/peilinyang//files/Ecoplanning.pdf
   In order to flatten the curve of COVID-19 and reduce potential deaths, most countries have adopted lockdown policy. However, during lockdown period we found the market value of website establishments still go up. In this paper, our primary goal is to explain how this happen during lockdown. Based on workhorse SIR model, a heuristic single sector model is introduced as a benchmark model to study the impact of lockdown on the whole economy. In second part, we build a planning problem with industrial structure—online and offline sectors. We show how lockdown policy will crowd out the offline sector and how that effect embodies on macro variables.

3. "China's Policy Instruments: Tax Reduction, Retirement Prolonging and Welfare Changes." Peilin Yang. 2019. [link]
   https://tteclinc.github.io/peilinyang//files/OLG.pdf
   China is facing a series of significant debt problems. We have studied the changes in debt and benefits under different policy instruments under the framework of large-scale OLG. Under the three retirement ages, as the retirement age increases, the maximum increase in benefits is 17.98%, and the debt is 75.69%. Under the five tax rates, the optimal tax rate is 28%, the maximum increase in benefits is 22.65%, and the maximum debt ratio is 75%.

Work in Progress

4. "Rare Disaster Element in HANK", Peilin Yang. 2021.

The rare disaster factor has become a powerful factor explaining the mystery of equity premium. This paper studies a heterogeneous new Keynesian model (HANK) in which rare disaster pricing factors are nested. This factor can effectively explain the excess risk premium and business cycle, and I have made a detailed comparison with the representative New Keynesian model (RANK). It proves that due to the existence of heterogeneous marginal propensity to consume (MPC), HANK has greater volatility and explains more asset premiums. In other words, inequality in the economy will lead to greater economic fluctuations.

5. Bayesian Estimation of Heterogeneous Firms Distribution Dynamics, Peilin Yang. 2021.

I present a method for estimating dynamic HANK models using Bayesian estimation. The method combines the projection and perturbation solution method developed by Reiter (2009) with Bayesian estimation techniques. This combination allows the estimation procedure to incorporate in the estimation dataset time series of moments of the cross-sectional distribution of agents. I showed how the heterogeneous stochastic shock of TFP on the firms affects the micro and macro moment in the firms' distribution dynamics.

Research Experience

Stanford University, *Graduate School of Business*, Research Fellow   Nov. 2020 - Presented.
- Local Projection and SVAR
- NLP in text matching
- Trade and Innovation
- Sovereign bond default model
- Micro finance in general equilibrium model

*Harvard University***,** *Department of Economics*, Research Assistant to David Yang,   Mar. 2020 – Presented.
- China's AI Companies (2020)
- Bureaucracy and Innovation (2020)
- China's Science Innovation (2021)

University of Illinois at Urbana-Champaign, *Department of Mathematics*, Research to Runhuan Feng,   Sep. 2020 - Nov. 2020.
- Reinforcement Learning and High-Dimension Dynamics Programming

Morgan Stanley, *Sales &. Trading Division*, *Quantitative Trader Internship*, Jul. 2020 – Aug. 2020

Asian Development Bank, *ADB TA PRC# 3148: China Pension Reform Project*, Jul. 2019 - Oct. 2019.

WorldQuant, Independent researcher, Oct. 2018 - Sep. 2019.
- Machine Learning and NLP

Fellowships, Awards, and Honors

2018   *Chinese Mathematical Modeling Competition Award, First Prize*
            I build a model about quantitative the attractive force of a city by using methods PCA and neural networks.

2018   *China Undergraduate Mathematical Contest in Modeling Award, First Prize*
            I build a model about the heat transfer in different media. The main problem is about PDE numerical algorithm of finite difference.

2018   *Chinese College Students Mathematics Competition Award, First Prize*
            Mathematical Analysis and algebra.

2019   *American College Students Mathematical modeling competition, First Award*

I build a model about environmental costs. The main problem is about ODE dynamic system and continuous-time optimal control.

Teaching Experience

Nankai University Graduate Advanced Macroeconomics I (TA, Spring 2019)
        Graduate Stochastic Analysis and Optimal Control Theory (TA, Spring 2020)

Presentations and Seminars

2021 Operations Research Society of China, Tsinghua University, Simple planning problem of industrial structure during pandemic.

2020 Operations Research Society of China, Tsinghua University, Numerical solution to higher dimensional differential equations.

2019 Operations Research Society of China, Tsinghua University, Uncertainty CRRA Model and Risk Aversion.

2019 Summer Seminars of Computation and Economics, Shanghai University of Finance and Economics.

Computer Skills and language

Highly Proficient: Python (Data Processing, Plot, ArcGIS, Numerical Computation, Web Scraper), MATLAB, Stata, LaTex, R *(ArcGIS, GeoDa)*, Julia, SQL, Fortran

Familiar: ArcGIS, C++, GAUSS, HTML, Linux