

ZICHAO YANG

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EDUCATION

Virginia Tech (VT) Doctor of Philosophy in Economics	Blacksburg, U.S. Expected May 2021
Huazhong University of Science and Technology (HUST) Master of Science in Economics Thesis: “ <i>A Study on the Reasons of China’s Economic Growth Slowdown</i> ”	Wuhan, China July 2016
Northwestern Polytechnical University (NWPU) Bachelor of Engineering in Electronics and Information Thesis: “ <i>A Study on Anti-interference of Data Link</i> ”	Xi’an, China July 2012

RESEARCH INTERESTS

Cryptocurrency, Fintech, Macroeconomics

PEER-REVIEWED PUBLICATION

1. [Price Dispersion in Bitcoin Exchanges](#), Tsang, K.P. & Yang, Z. (2020) , *Economics Letters*.
Abstract: Bitcoin is traded in a number of exchanges, and there is a large and time-varying price dispersion among them. We identify the sources of price dispersion using a standard time-varying vector autoregression model with stochastic volatility, and we find that shocks to transaction fees and bitcoin price growth explain on average 20%, and sometimes more than 60%, of the variation of price dispersion.
2. [The Market for Bitcoin Transactions](#), Tsang, K.P. & Yang, Z., forthcoming, *Journal of International Financial Markets, Institutions & Money*
Abstract: Transaction fees in the bitcoin system work differently from those in conventional payment systems due to the design of the bitcoin mining algorithm. In particular, transaction fees and transaction volume in the bitcoin system increase whenever the network is congested, and our VAR results confirm that is indeed the case. To account for the empirical findings, we build a model where users and miners together determine transaction fees and transaction volume. Even though the mechanism of fluctuating transaction fees in bitcoin introduces an extra cost of uncertainty to users, a back-of-envelope calculation shows that the cost of using the bitcoin network for transactions is still smaller than the cost of using the current conventional payment system with a fixed transaction fee rate. However, this calculation may underestimate the cost due to the crowding-out effect on small transactions during the congested period.

WORKING PAPERS

1. [Do Connections Pay Off in the Bitcoin Market?](#) 2020, Job Market Paper
SQL and R source codes: [download](#)
Abstract: I study the trading behavior of investors in this relatively new and unregulated bitcoin market. By parsing transaction data from the bitcoin blockchain, I search for addresses that are connected based on their trading behavior and identify the bitcoin investor network. I find that, from June 2016 to May 2019, addresses that are connected in the network earn 20.75% higher return than their

unconnected peers on average. Furthermore, the return difference also exists among these connected addresses. By dividing the connected addresses into ten groups I find the addresses in the top two groups earn higher returns than the rest connected addresses. Among the addresses inside the top two groups, I find that, compared with degree centrality, higher eigenvector centrality is a more related indicator to higher returns.

2. [The Impact of Stay-at-Home Orders on US Output: A Network Perspective](#), with Shaowen Luo and Kwok Ping Tsang, 2020

Abstract: Under the stay-at-home orders issued by states, economic activities are reduced or put on hold by some states across the U.S. to control the spread of COVID-19. By combining several sources of data, we estimate the output loss due to such restrictions using a network approach. Based on our most conservative estimates, the measures as of April 15, 2020 reduce 26% of total US output per period, and about 43% of which is due to the input-output connections in the production network. Using a SIR model with an inter-state infection network, we also calculate the cost of reducing each infection to be approximately \$150,000 during the period of March 19 to April 15, 2020. Simulation results of various hypothetical stay-at-home orders show that the unit cost of infection reduction of the existing order is about 13% higher than the local minimum.

RESEARCH EXPERIENCE

Virginia Tech

Graduate Research Assistant, Advisors: Shaowen Luo, Kwok Ping Tsang Feb. 2020 - Aug. 2020
Project: The Economic Impact of COVID-19

- Collect COVID-19 related data in China and the U.S.
- Pre-process the raw data using R and Python
- Build a SIR model with the network extension

Graduate Research Assistant, Advisors: Suqin Ge, Mark Liu, Sudipta Sarangi Jun. 2020 - Aug. 2020
Project: COVID-19's Gendered Impact on Academic Productivity

- Scrape working paper data and author data from NBER website using Requests and BeautifulSoup packages in Python
- Give a talk on data scraping
- Pre-process the scraped data using R and Python

Graduate Research Assistant, Advisors: Shaowen Luo, Kwok Ping Tsang Sep. 2019 - Dec. 2019
Project: The Economics of Prices in Pre-Modern China

- Collect pre-modern China economic data from multiple sources and digitize the data
- Pre-process the raw data using R and Python

TEACHING EXPERIENCE

Virginia Tech

Instructor, Macroeconomics (Intro level) Aug. 2020 - Present

- Teach the intro-level macroeconomics (48 students)
- Teaching method: online

Instructor, Microeconomics (Intro level) Jan. 2020 - May 2020

- Teach the intro-level microeconomics (34 students)
- Teaching methods: in-person & online

Teaching Assistant, Managerial Economics Sep. 2017 - Dec. 2019, 2020 Summer Session
Teaching Assistant, Advanced Topics in Macro (Grad Level) Sep. 2018 - Dec. 2018
Teaching Assistant, Economics (Intro level) Sep. 2016 - May 2017

- Edit lecture videos
- Assist professor with preparing lecture notes
- Grade homework and exams
- Hold review session

Huazhong University of Science and Technology

Teaching Assistant, Lab Course: R programming Feb. 2015 - Jun. 2015

- Teach R programming
- Grade homework and exams

WORKSHOP & CONFERENCE

5th PIER Workshop on Quantitative Tools for Macroeconomic Policy Analysis Philadelphia, 2021
with scholarship sponsored by the University of Pennsylvania

WEAI 95th Annual Conference Denver, 2020

INVITED TALK

“Efficiency in the Bitcoin Market,” Huazhong University of Science and Technology July, 2019

SKILLS & CERTIFICATIONS

Computer: R, Python, Matlab & Dynare, SQL, iMovie
Language: English (Fluent), Chinese (Native)
Certifications: Machine Learning ([Coursera Certificaiton](#))
Introduction to Programming with MATLAB ([Coursera Certificaiton](#))

AWARDS AND SCHOLARSHIP

Ph.D. Student Scholarship Aug. 2016 - Present
Phi Kappa Phi Honor Society 2017
Master Student Scholarship Sep. 2013 - Jul. 2016
Zhi Xing Scholarship Sep. 2013 - Jul. 2015
Excellent Student Cadre Award Sep. 2013 - Jul. 2014
Outstanding Student Award Sep. 2010 - Jul. 2011
Honorable Mention Award in 2011 NMUN·NY Apr. 2011

RELATED PROFESSIONAL EXPERIENCE

2011 National Model United Nations Conference (NMUN·NY) New York City, U.S.
Delegated the diploma from Germany in the General Assembly Second Conference, and passed a resolution with other diplomas on addressing the public debt in the aftermath of 2008 financial crisis.

REFERENCES

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