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Education

Bachelor of Arts Honours, Major in Economics, University of Saskatchewan, Canada 2017.

Ph.D. in Applied Economics, University of Saskatchewan, Canada 2017 - expected 2024.

Fields of Interest

Financial Technology, Monetary Economics, Cryptocurrency and Digital Assets.

Research

Working Papers

On the Relationship between Tether and Other Cryptocurrencies, with Enchuan Shao.

The Entry of Bitcoin Mining and its Welfare Implications, with Enchuan Shao.

Miner Competition and Transaction Fees, with Enchuan Shao.

Academic Experience

Sessional Lecturer in Economics

University of Saskatchewan and St. Thomas Moore College,
Sept. 2022 - Present.

Courses taught:

ECON 211 Intermediate Microeconomics,

ECON 311 Money Banking and Capital Markets,

ECON 114 Introductory Macroeconomics.

Teaching Assistant

University of Saskatchewan Department of Economics,
Sept. 2017 - 2022.

Graduate courses:

ECON 805 Mathematical Analysis in Economics,

ECON 850 Game Theory Strategic and Cooperative Choices.

Undergraduate courses:

ECON 498 Financial Economics,
ECON 450 Strategic Choice,
ECON 411 Monetary Theory,
ECON 214 Intermediate Macroeconomics,
ECON 211 Intermediate Microeconomics,
ECON 114 Introductory Macroeconomics.

Research Coach

St. Thomas Moore College,
Fall 2018.

Undergraduate Research Initiative and First-Year Research Experiences program coach.

Other Work Experience

Ministerial Assistant to the Minister of Justice

Government of Saskatchewan,
May - August 2016, Regina, SK.

Vice-Dean Research, Scholarly & Artistic Work Search Committee Member

University of Saskatchewan College of Arts and Science,
January - April 2015, Saskatoon, SK.

Student Crew Coordinator

University of Saskatchewan Students' Union,
August 2015 - April 2017, Saskatoon, SK.

Budget and Financing Committee Member

University of Saskatchewan Students' Union,
September 2014 - April 2015, Saskatoon, SK.

Awards and Grants

Google Academic Research Grant,
2024.

University of Saskatchewan Graduate Scholarship,
2017 - 2022.

Bank of Canada Governor's Challenge Grand Finalist,
2015.

Saskatchewan Advantage Scholarship,
2012.

Conference Presentations

Economics of Financial Technology Conference 2022,
Edinburgh, 2022.
Presentation: *"Miner Competition and Transaction Fees."*

Research Summaries

On the Relationship between Tether and Other Cryptocurrencies, with Enchuan Shao.

Tether is a stablecoin that is widely used to trade crypto assets. Using Tether's price volatility, characterized by two distinct regimes, we identify the structural relationship between Tether and Bitcoin price and the circulating supply of Tether. This study delves into the intricate dynamics of Tether (USDT) and its interactions with Bitcoin (BTC), providing valuable insights into the mechanisms that underpin stability. We propose a new hypothesis based on triangular arbitrage to explain the underlying market structure and the relationship between our variables of interest. We then compare the statistically identified model with the theoretically driven restricted models. Our findings highlight the critical role of the arbitrage mechanism, particularly triangular arbitrage, in maintaining the stability of the Tether price. Consequently, Tether demand shocks can inflate the Bitcoin price in the short run. Contrary to conventional wisdom, our results show that the circulating supply of Tether responds to price differentials in Bitcoin markets rather than its own market conditions.

Miner Competition and Transaction Fees, with Enchuan Shao.

In order to maintain the function of a decentralized financial system like Bitcoin, transaction fees are offered to engage miners in the transaction confirmation process. This paper investigates the effect of miner competition on the equilibrium transaction fees. We develop a game-theoretic model with costly entry into mining activities. We find that miners may strategically assemble fewer transactions into a block to reduce total fees, and as a result, to deter entry. Equilibrium transaction fees also depend on block rewards as a rise in total fees is accompanied by a drop in rewards. Our empirical analysis supports the model's predictions. We provide evidence on the existence of excess capacity in a block, taking into account the random confirmation process. The empirical findings demonstrate that heightened competition tends to increase the block size and total fees. Furthermore, the halving of rewards correlates to a fee hike.

The Entry of Bitcoin Mining and its Welfare Implications, with Enchuan Shao.

Mining is one of the key features to maintain the value and security of the Bitcoin system. Like mining of other commodities, Bitcoin mining requires a nontrivial fixed cost to enter the business. We extend a framework that captures some key features of Bitcoin to incorporate entry costs. We use the model to investigate the welfare effect of barriers to entry in Bitcoin mining. We find that barriers to entry can help to improve welfare. Our quantitative results show that this welfare gain is moderate when compared to an economy without entry barriers. The source of welfare gains is the saving in mining costs due to the reduction in competition, rather than the benefit from the drop in a delayed settlement.