

Alireza Marahel

Economics Ph.D. Candidate

CONTACT INFORMATION

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EDUCATION

Doctor of Philosophy, Economics

Indiana University, *Bloomington, IN, USA*

2018 - 2024

(Expected Graduation Date: July 2024)

Master of Arts, Economics

Indiana University, *Bloomington, IN, USA*

2018 - 2021

Bachelor of Science, Mechanical Engineering, (*Minor in Economics*)

Sharif University of Technology, *Tehran, Iran*

2013 - 2018

RESEARCH

Research Interests: Quantitative Economics, Climate Policy, Financial Econometrics, Machine Learning

Job Market Paper: “Evaluating Alternative Designs for Carbon Border Adjustment Mechanisms” [Draft: November 2023](#)

Abstract: This paper examines the Carbon Border Adjustment Mechanism (CBAM) as a potential tool to mitigate carbon leakage, with its design varying based on the inclusion of export subsidies and discrimination across trading partners. To this end, I adopt a quantitative multi-country, multi-industry trade model with climate externalities and abatement. I provide a novel theoretical decomposition of the welfare effects associated with carbon pricing in open economies, underscoring the incidence of the home country’s carbon tax on foreign residents as a vital welfare channel. The welfare decomposition reveals ambiguous welfare effects when export subsidies are incorporated in the CBAM, as they mitigate leakage but reduce the incidence of home’s carbon tax on foreign residents. I then map the model to data to evaluate these trade-offs quantitatively for the European Union. I find that non-discriminatory EU border adjustments lead to a Pareto improvement only if they exclude export subsidies, resulting in a 36 million tonnes reduction in carbon leakage. On the other hand, discriminatory EU border adjustments are Pareto improving if they feature export subsidies in addition to import tariffs, yielding a 130 million tonnes reduction in leakage. These results provide a possible justification for the current design of the EU CBAM.

Ongoing Research:

“Evaluating Asset Pricing Models Under Endogenous Regime Switching”, *with Yoosoon Chang and Joon Y. Park*

Working Paper

[Draft: May 2023](#)

- Developed a new approach to model panel regression with endogenous regime switching using an autoregressive latent factor.
- Performed extensive maximum likelihood estimation and non-linear regularized regressions to identify the macroeconomic risk factors determining the state of the market, captured by constructing portfolios using stock excess returns, through IU supercomputing systems, Slurm batch processing, and programming in MATLAB and Python.
- Showcased that allowing Capital Asset Pricing Model (CAPM) betas to dynamically adjust to market conditions significantly elevates model’s predictiveness in high volatility regimes.

“On the Effectiveness of Long-Short Term Memory Models in Predicting Inflation”, *with Yoosoon Chang and Joon Y. Park*

Work in Progress

- Examined the predictive performance of Long-Short Term Memory (LSTM), a recurrent neural network model, to forecast the U.S. inflation rate using the FRED-MD data set, by employing parallel computing techniques to enhance computational efficiency.
- Forecasted inflation using traditional time-series and various supervised machine learning models and compared their out-of-sample forecasting accuracy to LSTMs.
- Developed an algorithm to obtain near-optimal initial values for LSTMs that significantly enhances their predictive accuracy.

Publications:

“Revenue Mobilization for a Resilient and Inclusive Recovery in the Middle East and Central Asia”
with Fiscal Policy Group, Middle East and Central Asia Department, International Monetary Fund

2022

[\[Link\]](#)

RELEVANT POSITIONS

International Monetary Fund (IMF) Fund Internship Program, *International Monetary Fund* 2021
(Washington D.C., U.S.A.)

- Developed a framework to assess the tax capacity, identify its key determinants, and estimate tax revenue gaps/inefficiency in the Middle East and Central Asia countries, using a stochastic tax frontier model for panel data with time-variant inefficiency.
- Composed report sections and presented research findings within the IMF's MCD department, contributing to the methodological and empirical foundation that, through collaborative efforts with a team of economists, led to the subsequent publication.

McKinney Climate Fellow, Office of Sustainability *City of Indianapolis* 2023
(Indianapolis, IN, U.S.A.)

- Developed a community-wide greenhouse gas inventory for the City of Indianapolis using ICLEI ClearPath.
- Identified, categorized, and analyzed emissions sources across sectors and scopes, in preparation for CDP (Carbon Disclosure Project) reporting.
- Led sessions and streamlined communications with government agencies, industries, and local government officials to ensure the efficient collection of relevant data and foster collaborative relationships.

EXPERIENCE

Selected Teaching: *(For the complete list of teaching positions, visit my website)*

Associate Instructor, ECON-E 370 (Statistical Analysis for Business and Economics) 8 Semesters
Indiana University

Teaching Assistant, ECON-B 251 (Fundamentals of Economics I) Fall 2023
Indiana University

Teaching Assistant, ECON-E 211 (Applied Principles of Microeconomics: Creative Commerce) Fall 2023
Indiana University

Teaching Assistant, Introduction to Macroeconomics Spring 2017
Sharif University of Technology

Research:

Research Assistant for Professor Yoosoon Chang, Department of Economics 2020
Indiana University

HONORS AND AWARDS

McKinney Climate Fellowship, *Environmental Resilience Institute* 2023

Doctoral Assistantship, *IU Department of Economics* 2019 - 2023

College Graduate Fellowship recipient, *IU College of Arts and Sciences* 2018 - 2019

Top-Up Fellowship recipient, *IU College of Arts and Sciences* 2018 - 2019

Ranked Top 0.1% in Iran's Physics and Mathematics Nation-wide Universities Entrance Exam
(61st among approximately 250k applicants) 2013

PRESENTATIONS

IMF Middle East and Central Asia Department Virtual Discussion Forum, *International Monetary Fund* 2021

IU Trade Talk Seminar Series, *Indiana University* 2021

Hoosier Economics Conference, *Indiana University* 2021

IU Micro Brown Bag, *Indiana University* 2023

OTHER INFORMATION

Programming: Python (Tensorflow, SciKit-Learn), MATLAB, R, Stata, Unix, Slurm, SQL, Excel (VBA), ArcGIS, L^AT_EX

Language : English (fluent), Farsi (native)

REFERENCES

Department of Economics, Indiana University Bloomington

Professor Joon Y. Park

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Professor Ahmad Lashkaripour

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Professor Yoosoon Chang

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Phone: (812) 855-8035

Professor Christian Matthes

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