HUGH MACARTNEY

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PROFESSIONAL SUMMARY

Principal Economist with 15 years of combined industry and academic experience in workforce economics and applied econometrics. Leads teams of 10+ scientists delivering production-scale models affecting hundreds of thousands of employees at Amazon. Expert in structural modeling, causal inference, and productionalizing science—from discrete choice frameworks to GenAI-powered analytics. Published in top-tier journals (Journal of Labor Economics, Journal of Public Economics). Proven track record partnering with senior leadership, engineering teams, and product managers to translate rigorous research into business impact.

CORE COMPETENCIES

- Structural Econometrics
- Discrete Choice Modeling
- Causal Inference (IV, DiD, RDD)
- Machine Learning & GenAI
- Production ML Systems
- Cross-functional Leadership
- Senior Stakeholder Management
- Team Management (10+ Scientists)

PROFESSIONAL EXPERIENCE

AMAZON, PXT Central Science — Principal Economist

Arlington, VA • June 2021 – Present

Lead scientists delivering structural econometric models and causal inference analyses informing critical workforce decisions affecting hundreds of thousands of employees. Partner cross-functionally with senior leadership, product managers, engineers, and data scientists to productionalize science at scale.

- Manage team of 10+ scientists; successfully promoted 4 team members (2022-2025)
- Promoted to Principal Economist in April 2023, recognizing leadership and technical contributions
- Created organizational causal inference and scientific writing templates adopted as team standards
- Delivered 3 production models currently serving strategic decision-making at scale

Key Projects

Structural Model of Labor Supply

Built discrete choice structural model quantifying workforce behavioral responses across locations and time. Model integrates multiple data sources and supports counterfactual analysis to inform strategic workforce planning decisions.

Causal ML & GenAI Analytics

Led development and continuous improvement of causal predictive models deployed in production at scale. Integrated traditional econometric methods with modern ML techniques, including GenAI-powered text embeddings for feature extraction. Partnered with senior leadership, engineering teams, and product managers to ensure model performance and business impact.

DUKE UNIVERSITY, Department of Economics — Assistant Professor

Durham, NC • July 2011 – June 2021

Conducted rigorous research in labor economics, public economics, and economics of education. Developed expertise in structural modeling, causal inference methods, and computational economics.

• Published 4 peer-reviewed articles in top-tier journals including Journal of Labor Economics (lead article) and Journal of Public Economics

• Secured C$270,000 in competitive research grants from Social Sciences and Humanities Research Council

• Presented research at premier conferences (NBER, Urban Economics Association, Society of Labor Economists)

• Taught graduate-level courses in Public Economics of Education and Personnel Economics

EDUCATION

UNIVERSITY OF TORONTO — Ph.D. Economics

2011

UNIVERSITY OF TORONTO — M.A. Economics

2005

UNIVERSITY OF TORONTO — B.Sc. Physics and Astronomy

2003

SELECTED PUBLICATIONS

• "Unequal Worker Exposure to Establishment Deaths" (with Nielsen and Rodriguez), **Labour Economics**, 73: 102073, 2021

• "What Determines School Segregation? The Crucial Role of Neighborhood Factors" (with Caetano), **Journal of Public Economics**, 194: 104335, 2021

• "School Boards and Student Segregation" (with Singleton), **Journal of Public Economics**, 164: 165-182, 2018

• "The Dynamic Effects of Educational Accountability," **Journal of Labor Economics**, 34(1): 1-28 (lead article), 2016

PROFESSIONAL AFFILIATIONS

• Faculty Research Fellow, National Bureau of Economic Research (2013-2022)

TECHNICAL SKILLS

Methods: Discrete Choice Models, Structural Estimation, Causal Inference (IV, DiD, RDD, Synthetic Controls), Maximum Likelihood Estimation, Causal ML, GenAI Text Embeddings

Software & Tools: Stata, Matlab (expert); Python, SQL, AWS (working knowledge)