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### **Core Competencies** .

Programming Languages R, SAS, Stata, &TeX, Excel, Python, SQL, C++

**Professional Expertise** Analysis of Competitive Dynamics of Markets; Econometrics; Analysis of Large Datasets; Antitrust Economics

**Research Interests** Sensitivity Analysis; Causal Inference; Bayesian Modeling; Statistical Learning

### Education \_

#### **University of California, Los Angeles**

MASTERS OF SCIENCE, STATISTICS; GPA: 3.93

• Courses: Multivariate Analysis with Latent Variables; Advanced Modeling and Inference; Monte Carlo Methods; Causal Inference; Natural Language Processing; Optimization; Statistical Modeling and Learning; Machine Learning; Probability; Research Design, Analysis, and Sampling; Statistical Programming

#### **Boston College**

BACHELORS OF ARTS; GPA: 3.70; cum laude; Double Major: Mathematics and Economics

- · Giffuni Prize for outstanding Honors Thesis in Economics; Honors in Economics; Dean's List All Semesters; Undergraduate Research Fellow; Led Fed Challenge Team
- · Courses: Probability; Mathematical Statistics; Differential Equations; Numerical Analysis; Linear Algebra; Multivariable Calculus; Real Analysis; Econometrics

# Experience.

## **Charles River Associates: Antitrust and Competition Economics Practice**

Oakland, CA & Boston, MA

CONSULTING ASSOCIATE (2015-2019)

2012 - 2019

- Designed and conducted empirical analyses of market dynamics related to mergers, acquisitions, and antitrust litigations. Explored, cleaned, manipulated, and analyzed large datasets (e.g., claims data, prescription data, sales data) to understand competition, pricing, and client operations.
- Promoted from Associate to Consulting Associate one year ahead of the rest of Associate class.
- Selected as one of 8 "SAS Experts" from over 500 global consulting staff at Charles River Associates. Assisted colleagues with difficult tasks and problems in SAS.
- · Led a team of 3 analysts and coordinated with another consulting firm and 5 of the largest national health insurers in an ongoing antitrust litigation brought against a hospital system. Used terabytes of health insurance claims data for the following. Working in R and SAS:
  - Implemented semiparametric discrete choice models to calculate patient willingness-to-pay for hospital services.
  - Estimated prices for services and fit regression models of price using a wide range of hospital-specific features.
  - Calibrated a vectorized demand system and defined markets by optimizing a system of equations using diversion ratios, estimated prices, and margins.
- Directed a team of 3 analysts and coordinated with clients in an antitrust litigation seeking up to \$100M in damages between 3 of the largest national health insurers and a group of ambulatory surgical centers. Analysis led to a favorable settlement. Working in SAS and Stata:
  - Designed and applied statistical models of prices faced by health insurers and enrollees in selection of providers.
  - · Created market definition, service area, and market sharé analyses focused on the market for outpatient surgeries.
- Coordinated team of 4 analysts related to the \$1.9B successful acquisition by CVS of Target's 1,660 pharmacies. Analyses showed little danger to consumers.
  - Analyzed market concentration for thousands of localized geographic markets with terabytes of prescription-level data in SAS. - Devised an event study using regression analysis to evaluate the impact of new CVS pharmacies on Target sales/prices in SAS.
- Evaluated the merits of opposing expert's damages model in a litigation seeking over \$150M in damages related to allegations of poor performance of an iron ore mine.
- Ran model under different assumptions, recalculated prices for marginal customers, revised growth trajectories, and corrected statistical models of relationships. · Mentored four Analysts and Associates. Coached programming, data analysis, presentation skills, and career development.

- ASSOCIATE (2014-2015); ANALYST (2013-2014); ANALYST INTERN (2012-2013)
   Promoted from Analyst to Associate six months ahead of the rest of Analyst class.
  - Created a capacity closure model in SAS used to evaluate the potential competitive effects of a merger in the wallboard industry. The merger created a global wood products company with sales over \$1.6B. The model is now standard practice for colleagues when assessing a company's ability to raise prices post-merger.
  - · Worked on numerous pre-deal mergers and acquisitions, analyzing the potential competitive effects of the proposed deals. Variously worked in R, SAS, and Stata.
    - Designed statistical models of price correlation, co-integration, and arbitrage related to the global fertilizer market.
    - Estimated models using customer-to-store drive times at the census-block level to evaluate the potential diversion of supermarket customers.
    - Preformed event-study regression analysis of the impact of a merger in the pay-day credit market on hundreds of individual lending branches.
    - Conducted regression analyses of the determinants of prices in the national industrial water pipe market.
  - Led corporate recruiting for the Antitrust and Competition Economics Practice in 2015.
  - · Led Green Office Initiative (a sustainability project) for the Boston Office of CRA in 2013 and 2014.

#### Research \_

# **Building a Sensitivity Framework for Selection and Omitted Variable Bias**

Los Angeles, CA

· Goal is to build a sensitivity framework forselection bias and omitted variable bias together using path tracing rules for directed acyclic graphs or structural equation models. The framework will allow for sensitivity analysis of the two types of bias seperately or together and shifts discussion toward evaluating how strong confounding or selection would have to be to alter the results.

**Big Data Big Problems** Los Angeles, CA

WITH CHAD HAZLETT AND CARLOS CINELLI

• Building off of Cinelli and Hazlett (2020), we use sensitivity analysis in linear regression models to highlight a simple fact: large samples make it more likely that weak (or spurious) relationships will be statistically significant, which can mislead practitioners. Discussion of effect importance ought to incorporate uncertainty from identification as well as estimation. The focus of this paper is to demonstrate that this becomes increasingly more important as sample size increases.

### Rational Bias in Inflation Expectations

Boston, MA

WITH ROBERT MURPHY 2013 - 2015 · Using generalized method of moments, estimated a structural model of the economy to directly test hypotheses about whether inflation expectations respond rationally to food and energy price movements. Statistical analysis done in Stata.

• Presented research at American Economic Association Annual Meeting; Boston, MA; January 4, 2015.

· Publication details: "Rational Bias in Inflation Expectations," Eastern Economic Journal; advance online publication October 19, 2015; publication January 9, 2018 (with Robert Murphy). See https://doi.org/10.1057/eej.2015.50.