

APPLIED ECONOMICS NEWSJOURNAL

Interview with Prof. Cornwall, co-author of new book on *Data Science for Public Policy*



Gary J. Cornwall
Research Economist at the Bureau of
Economic Analysis and GW Applied
Economics Adjunct Professor

Jeffery C. Chen, Edward A. Rubin and Gary J. Cornwall published *Data Science for Public Policy* in 2021. The book combines anecdotes from public sector experience with technical aspects of the field. It addresses current topics in ethics and fairness, data product development, and team organization in data science. It also includes data sets and functioning code examples in the R language. This interview was conducted in the fall of 2021. Gary will teach a course based on his book as part of the Applied Economics Master's Program.

What unique contribution do you feel this book provides ?

I like to think that the book we wrote is an organic way of teaching upper-level undergraduate and/or master's students how to think about operating as a data scientist in public policy. Much of the field of public policy focuses on strategy or narrative and we wanted to expose those learning about policy decisions to data science and prediction concepts to help make timelier and smarter decisions.

Additionally, this book-while it has quite a bit of math in it - saves the nitty-gritty details for other texts. Instead, we focus on key mathematical functions necessary to understand the topic more broadly and then reinforce the concepts through do-it-yourself examples. This approach allows a practitioner to grasp what is happening while at the same time having actionable examples from which to build a specific endeavor.

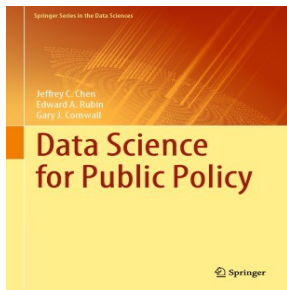
Who is this book's target audience? Can it be used as a textbook in a traditional class setting?

I will answer the second question first as it is the easiest, yes! We geared our book towards upper-level undergraduate and master's level students in economics and public policy. In fact, the origin of the book comes from the notes Jeff Chen used in teaching master's level public policy courses throughout his career. It is augmented by our collective time working for the government (local and federal), non-profits, e-commerce, and financial firms, among others.

Highlights

- Interview with Gary Cornwall
- NABE Meeting
- Applied Economics Professors in Action
- Celebrations!
- Our Graduates
- Student Research
- Internship Funding
- Career Events
- What's Fun
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Volume II , Issue 1



Data science is an expansive field, and we can only scratch its surface. To make sure students get the most out of the book, we designed it to build practical hands-on skills and the strategic mindset to apply them. We start by building core programming skills in the R language, including data manipulation, cleaning, and merging. Some of these concepts are covered in your typical applied textbooks, but many concepts, such as entity resolution and record linkage techniques, are often overlooked. We take the early chapters to cover not only these fundamental aspects of data science but also to help build a programming vocabulary so that later chapters are more easily digested.

Once we cover the basics, we move on to techniques, namely exploratory data analysis, regression models, classification problems, causal inference, and prediction. Some concepts are already commonplace in public policy, while others are novel to the field. We pay particular attention to how these skill sets emerge from different traditions and their application in the field. From this base, the reader is then prepared to cover advanced topics, such as clustering, spatial data, and natural language processing.

How will others build from your work? What other significant areas of the field need attention?

My two co-authors and I take an interdisciplinary approach to data science. We view the tools we cover as just that, tools. Part of becoming a data scientist is learning which tool is appropriate not only for the technical objective but also for the policy objective. The more tools we can expose our students to, the more they can understand what options they have to pursue more detailed knowledge. As for areas students should pay particular attention to, I think ethics is the highest on the list. There is a growing movement in data science towards understanding the equality and privacy aspects of prediction algorithms. For example, the U.S. Census Bureau is working on deploying the concept of differential privacy on data products to preserve the identity of respondents. Whether or not this concept is implemented depends on many factors, but it's clear that the field is moving in this direction.

The National Association for Business Economics (NABE) Annual Meeting



Organized around the theme, “Shocks, Shifts and the Emerging Economic Landscape,” the NABE meeting addressed the global health crisis, labor market and supply chain disruptions, enduring challenges from climate change, growing fiscal imbalances, and reduced international cooperation.

Seminars addressed the impact of COVID on the health sector and forecasts with respect to herd immunity, the U.S. Federal Reserve outlook and budgetary responses, and the persistent effects on labor markets. The conference highlight was the talk by Janet Yellen, Secretary of the U.S. Department of Treasury. She focused mainly on how the Treasury functions and the steps it has taken during the pandemic.

GWU was a Bronze sponsor of the conference, meaning that our master’s and Ph.D. students were able to attend the conference at no charge. As a NABE University partner, our students are eligible to apply for fellowships to attend NABE events. **Suhaas Ramani** attended as a NABE Diversity Scholar and **Dinh Nguyen** attended as a NABE Foundation Annual Meeting Scholarship winner.

Applied Economics Professors in Action

The Professors in our Master of Science Program demonstrate applied economics in action so we sought their views on three related and relevant themes: (i) How does their work demonstrate applied economics in action? (ii) What issues are they investigating? and (iii) What are their major concerns about the global economy?

Examples of Economics in Action Our faculty have expertise in a variety of fields and research methods. They bring to the classroom many years of substantive work experience analyzing government debt and fiscal policies, corporate taxation, business and labor regulation, housing markets, transportation, time series and forecasting techniques, monetary and financial sector policies, official statistics, and economic and trade policies.

Aaron Betz is an Analyst in the Macroeconomic Analysis Division of the Congressional Budget Office.

Ronald Bird is the Senior Regulatory Economist at the United States Chamber of Commerce.

José M. Fernández is the Chief Economist for the Office of Fair Housing and Equal Opportunity at the U.S. Department of Housing and Urban Development. **Diana Furchtgott-Roth** served as the Deputy Assistant Secretary for Research and Technology at the U.S. Department of Transportation. **Hong Kim** is Lead Regulatory Economist at the U.S. Department of Labor.

Argyn Kuketayev is Executive Director at Morgan Stanley, an investment banking company.

Alfredo M. Leone worked at the International Monetary Fund (IMF) and the Central Bank of Argentina.

Christine McDaniel is a Senior Research Fellow at the Mercatus Center at George Mason University.

Joann Weiner, the founding Director of the GW Applied Economics Master's Program, worked for the U.S. Treasury Department, as a consultant for the European Commission, and for several news organizations.

You can learn about our faculty at <https://economics.columbian.gwu.edu/applied-economics-instructors>



Joann Weiner invited the Applied Economics Professors and the Graduate Assistants from the Ph.D. Program to a backyard celebration over Labor Day!

Applied Economics Professors in Action

Current Areas of Investigation

Our professors are actively pursuing a number of projects.

Aaron Betz is exploring the effects of federal investment in infrastructure on the US economy, specifically the productivity effect on labor and private capital that comes from increasing the stock of government capital. He is also examining the effects of anticipation or foresight of expiring investment incentives in the tax code. **Ronald Bird** is estimating the social cost of carbon emissions as applied in regulatory policy decisions. **José M. Fernández** is working on understanding how Automated Underwriting and Automated Home Valuation technology affect the gap in the homeownership rate and home valuation in minority communities across the United States. **Diana Furchtgott-Roth** is researching how transportation will change after the pandemic.

Hong Kim is researching wage and employment disparity and wage stagnation. **Argyn Kuketayev** investigated why economists are perceived to be bad at forecasting downturns and found that they are actually not that bad, but are rational in being conservative in this regard. He is trying to estimate the costs of over-predicting recessions. With colleagues at the IMF, **Alfredo M. Leone** is researching experiences of debt reduction in highly-indebted countries and also exploring factors explaining the decline in GDP per capita of certain emerging economies relative to that of advanced economies. **Joann M. Weiner** continues to explore fundamental corporate tax reform, with a focus on the formulary apportionment system that the OECD countries are considering as part of their global tax work.

Current Economic Developments

Most professors expressed concern about inflation and the high levels

of public debt across the world resulting, to a great extent, from the fiscal and monetary policies implemented to address the COVID-19 pandemic. The challenges to transition to environmentally-friendly technologies (such as electricity-based transportation) and the disruption of supply chains and its effects on global trade and growth are also a matter of concern. Emerging areas of interest are adopting technology to analyze big data, machine learning and artificial intelligence, and the ability of societies to balance the trade-off between economic development and social equity.

Regarding the U.S. economy, professors noted the risks associated with the magnitude of planned government spending and the consequences of regulations and raising taxes on investment, innovation, job creation, and production. There is also preoccupation with the decreasing labor force participation rate, the waning power of labor, and the losses of pensions and retirement plans, particularly as workers take gig economy jobs that don't provide benefits.

Note from the Director

It's good to be back on campus! And, although we must wear masks when we are inside and get our COVID-19 test at least twice a month, there's nothing like meeting everyone to remind us of how much we missed seeing each other.

We had a busy fall! We celebrated GW's graduates from the classes of 2020 and 2021 on the National Mall, we held an in-person orientation for our more than 30 new students, and a welcome back reception for everyone. I loved meeting so many of our students for the first time! I also am glad to have our second semester students in my Applied Microeconomic Theory course.

Our professors spent a year teaching remotely. To thank them for the hard work they put in during our virtual-learning period, I hosted a dinner for our professors and graduate assistants.

If you'd like to speak to me, we can meet in my [personal WebEx](#) room. I love hearing from our students, graduates and anyone interested in our program!

MS in Applied Economics
Director: Joann M. Weiner
jmweiner@gwu.edu

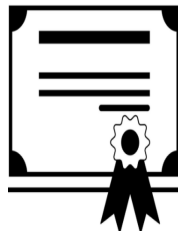
Celebrations!!!



Awards for Academic Year Summer & Fall 2021

Overall Performance

Jawad Zureikat



Highest Academic Achievement

Lauren Korlewitz
Heesun Moon
Maria Elisa Vollmer Nino



Photo shows Lindsay Aramayo and her mom, Elisabeth Ullman Calderon and her husband, Cuong Nguyen, Director Joann Weiner, Disovankiri Boung, Abdulkarim Alkadri, and Sean Windle and his girlfriend



Recent Graduates

Abdulla Alkhtib

Abdullah Almezini

Claudia Brito

Qirui Hai

Trent Kiefaber

Lauren Korlewitz

Kekai Liu

Heesun Moon

Emily Nguyen

Yue Pan

Maria Elisa Vollmer
Nino

Su Wang

Jinxuan Wu

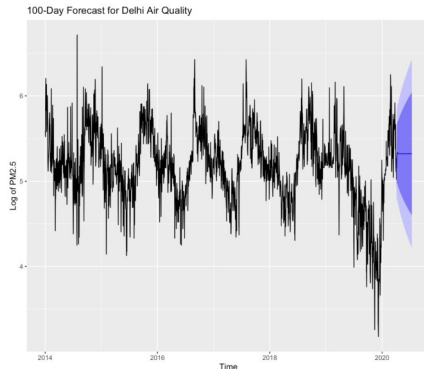
Jawad Zureikat

After a year of pandemic woes, GW celebrated about 5,000 graduates from the classes of 2020 and 2021, including more than 80 of our Masters in Applied Economics, on October 2, 2021 at the National Mall.

The keynote speaker, U.S. Senator and GW Law School attendee, Elizabeth Warren advised graduates to “get in the fight for opportunity, race, gender, sexual identity, and opportunity to survive in a world not suffocated by climate change or bled to death by wars.”

Evaluating Air Quality in Delhi During COVID-19

Tarush Gupta (MA Alumni, 2021), tarush@gwmail.gwu.edu



As a consequence of rapid industrialization and globalization in India, the capital city of Delhi has faced exponential growth – one that has surpassed the stakeholders' ability to mitigate the air pollution caused by these activities. Gupta uses the Box-Jenkins Approach on the daily data of fine particulate matter (PM_{2.5}) between 2014 and 2020 to capture and project the trends in ambient air pollution. While this pollutant saw a sharp fall as a consequence of COVID-19 related restrictions, those pre-pandemic levels were soon realized. The city continues to experience substandard air quality that appears to be unaffected by policy and pandemic-related changes.

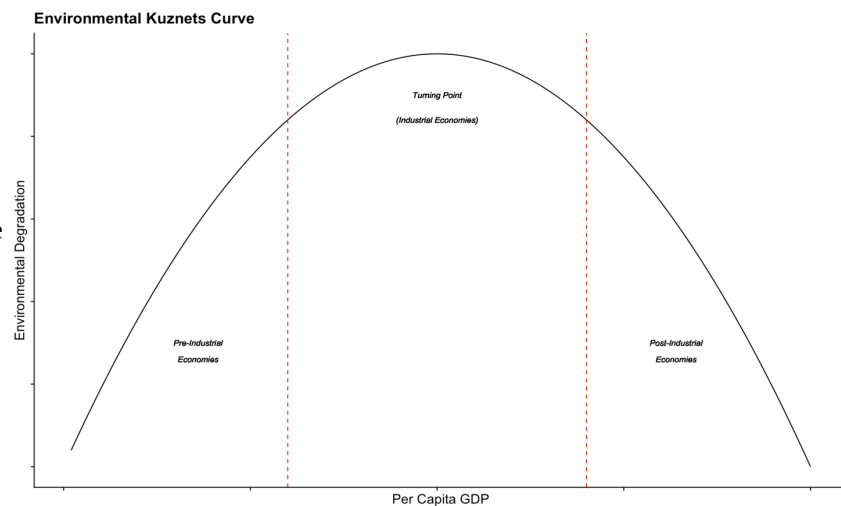
Note: Tarush Gupta wrote this paper for ECON 6376 Time Series Econometrics

Is Green Growth Possible?

Examining the Environmental Kuznets Curve (EKC) in the United States

Sean Windle (MA Alumni, 2021), seanwindle@gwmail.gwu.edu

This paper examines the EKC hypothesis in the United States using annual time series data on per capita CO₂ emissions and per capita gross domestic product (GDP) for 1960 to 2018. The EKC posits that economic growth initially leads to environmental degradation, but as income per capita rises, this trend eventually reverses so that at higher levels of income, economic growth leads to environmental improvement. At this point, consumers are more amenable to paying higher prices in exchange for greater environmental standards. Thus, the implication is that the environmental indicator is an inverted U-shaped function of per capita GDP.



Note: Sean Windle wrote this paper for ECON 6376 Time Series

Given the threat posed by climate change and the need to achieve sustainable development, a better understanding of the relationship between economic growth and the environment is critical to enacting sound public policy. Windle tests the EKC hypothesis from linear, quadratic, and cubic functions, in both level and logarithmic form. Using the first difference of both series, the linear function results show the existence of a positive short-run link between per capita CO₂ emissions and per capita GDP. The quadratic function results indicate a delinking of emissions and income, providing evidence of an EKC relationship; however, the estimated turning point is not economically plausible. Using the Engle-Granger methodology, he finds no evidence of a long-run relationship between CO₂ emissions and GDP.

MASTER of SCIENCE in APPLIED ECONOMICS INTERNSHIP FUNDING

The Master of Science in Applied Economics Program provides financial support for our students who are pursuing internships that allow them to use their applied economics skills, whether overseas or within the United States, in the public or private sector, and in any type of organization. Students must meet academic and other requirements to be eligible for the award.

We have granted internships with the World Bank Group for **Sylvia Bishweka** (Global Indicators Group), **Shoola Dzhumaeva** (Development Economics Vice Presidency), **Disovankiri Boung** (Global Indicators Group, Development Impact Evaluation Unit), **Dinh Nguyen** (Manufacturing, Agribusiness and Services Unit, Development Impact Department, International Finance Corporation), **Seunghwan Lee** (Sector and Economic Development Department, International Finance Corporation), with the United Nations to **Ruth Akor** (Development Program, Africa), with Public Citizen to **Cuong Nguyen** (Global Trade Watch), with Frontier Financial to **Isaac Amoah**, and with the Center for the Advancement of the Steady State Economy to **Lindsey Ljungberg** and **Jawad Zureikat**.

Contact Program Director **Joann Weiner** at jmweiner@gwu.edu if you would like to apply for funding.

Discussion of Careers in Applied Economics



Our program hosts **Careers in Applied Economics** and **Applied Economics in Action** events that show our students where applied economists find jobs and how they apply their skills.

ECONOMIC DATA FROM THE U.S. CENSUS BUREAU

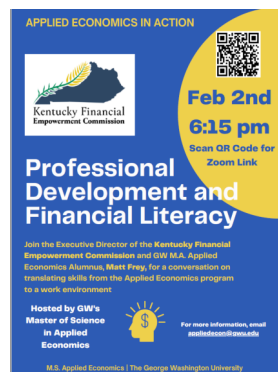
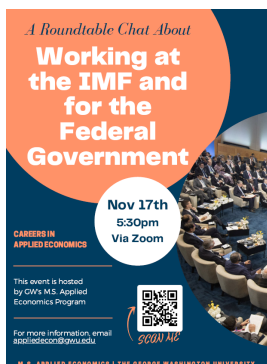
What it is, where to find it, and how to use it.



We've held several career events this academic year, including a discussion of careers in consulting with applied economics alumni **Kristin Parisi**, class of '21, (FTI Consulting) and **Kiri Boung**, class of '21, (Coherent Economics) and with representative Nitin Dua (BatesWhite), a fireside chat with Elaine Buckberg, Chief Economist at General Motors, and an evening talking about working at the IMF with Cleary Haines (IMF), and for the Federal Government with **Prof. Aaron Betz** (CBO), **Prof. Diana Furchtgott-Roth** (Labor, Transportation, Treasury) and **Prof. Scott Wentland** (Bureau of Economic Analysis).

Matt Frey, class of '21, talked about his work as the Executive Director of Kentucky's Financial Empowerment Commission and how his Applied Economics degree and work at GW's Financial Literacy Excellence Center helped him land his dream job.

We also held an informative evening with Statistician Philip Thompson (Census Bureau) who talked about how to find and use Census data.



Note from the Editors



Alfredo M. Leone
(Adjunct Professor)

After a period of virtual work and learning, we are enjoying the return to campus and happy to meet in person. We are looking for the next generation of student editors. Working at the NewsJournal is a great way to build connections outside of the classroom and to sharpen your skills in editing and publishing.

If you're interested in joining our team, send an email to appliedecon@gwu.edu. #RaiseHigh!

Fall 2021 Student Editors



Abdulkarim Alkadri
(MA Alumi, 2021)



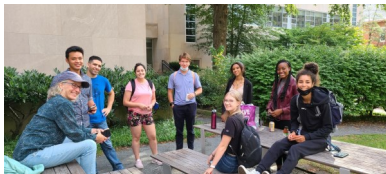
Suhaas Ramani
(Class of 2022)



Iliyuna Islam
(Class of 2022)



Thamr Almusilam
(Class of 2022)



GW Trivia!!

Answers to questions from Vol I, Issue 3

(From Suhaas Ramani)



1. What name is given to economic activities which are unrecorded?
- **Black Market / Informal Economy**
2. What is a group of producers acting together to fix prices called?
- **Cartel**
3. Which U.K. government body assesses whether a takeover is in the public interest?
- **The Competition Commission**
4. Oreo cookies are now extremely expensive to purchase. Instead of buying Oreo cookies, I now want to buy Chips Ahoy. Under which determinant of demand does this likely fall?
- **Change in price of a substitute good.**

INFO

Our LinkedIn Group

We have an active Applied Econ group on LinkedIn that is limited to current and former students, as well as faculty in the Department of Economics. If you haven't done so, make sure you join our group for news, events and job opportunities.

<https://www.linkedin.com/groups/13567382/>

Career Services

Wendy Wright, Career Coach
ccasgradserv@gwu.edu
careerservices.gwu.edu

News and Events

If you'd like to read the previous issues, please go to the [News and Events](#) tab on the Applied Economics [website](#).

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