



Gavin Alcott

With aid from the Perry World House Summer Award I was able to work with several distinguished professors on their cutting edge, inter-disciplinary research while living in Philadelphia over the summer. I developed my skills in advanced research methods in economics and political science and learned to conduct data analytics in R, Excel, and Python. This wonderful opportunity to build these applicable and marketable professional skills in the context of working in conjunction with world-class faculty at Penn would not have been possible without the Perry World House Summer Award and offers me an incredible base off of which to launch the rest of my professional career.

Over the past summer, I was lucky enough to not only work with a single professor on their projects but collaborated with several different faculty members on their projects in parallel, which allowed me to be exposed to many different stages of the academic research process and to build a variety of skills. This was uniquely advantageous for my development as if I'd focused on a single project, or a single professor, I would not have been exposed to the same breadth of content and tasks and would've had a far more single-dimensional experience. Overall, I worked with three different professors, and with each contributed to several different projects.

The first professor I worked with over the summer was Professor Jose Miguel Abito of the Business Economics and Public Policy department in Wharton. Professor Abito is an expert in the intersection of industry and public policy, and his work combines quantitative economic approaches with a deep understanding of the impact and significance of public policy and regulation. Specifically, he specializes in industrial organization, regulation, and environmental economics and takes great interest in how government policies interact with markets to affect the behavior of firms, with an eye for maximizing social welfare. As a student of both economics and public policy, Professor Abito's work spoke directly to my interests, making his projects an excellent fit.

My work with Professor Abito began with a focus on common-pool resource theory. Common-pool resources describe the set of resources which are non-excludable, but rivalrous. This means that unlike, for instance, a public good, common-pool resources are exhaustible and are subject to problems of overuse. This is particularly problematic given that excluding agents from exploiting them is definitionally difficult. What results is often colloquially referred to as the 'tragedy of the commons,' in which each agents pursuit of the

resource leads to a socially suboptimal end state, in which the resource is overexploited, congested, or even exhausted altogether. Classic examples of this form of resource include natural resources like coal, valuable minerals, fish stocks, or timber. While common-pool resources have long been studied for decades in economics (starting with articulations of the 'tragedy of the commons'), surprisingly few empirically backed and driven studies exist. Professor Abito was thus in the early stages of a project approaching the fracking industry from a common-pool resources perspective, with the goal of conducting an empirical analysis which would corroborate earlier economic-theoretic and game-theoretic literature. On this project, I began first by aiding Professor Abito in gathering relevant past literature, identifying the major papers and authors, and summarizing their findings and significance in the context of our project. Broadly, the literature on common pool resources can be split into three categories, roughly by era and approach. The first generation of papers tended to focus on economic theoretic articulations of the problem of the tragedy of the commons, generally with very basic modeling and formalization of the dilemma. These foundational papers were published largely between the mid-1950s and the 1970s. The next generation evolved the literature through the application of game-theoretic concepts to better model and articulate the challenges faced by agents competing over a common-pool resource. Specifically, by the mid-1990s, prisoner's dilemma based approaches were found to be apt at explaining some of the behavior of agents in these industries. Finally, holistic overviews, combining the techniques of the previous two generations, and even adding empirical data from regional fisheries began to emerge. Having gathered this literature, we next synthesized the information we'd found to articulate a literature review and construct a 'toy' model to act as a demonstration of the mechanisms at play in an industry subject to common-pool resource problems. While simplistic, this represented my first real effort in creating an economic model and was thus an excellent learning opportunity under the guidance of Professor Abito. As an additional aspect of this project, I aided Professor Abito in beginning to gather data necessary to conduct the desired empirical analysis. Specifically, I meticulously cross-referenced data regarding utility and natural gas company rate changes across the states. Unfortunately, because of the nature of the information, which was extremely disorganized and uncatalogued, this required a lot of grunt work and was impossible to automate. Ultimately, I was able to locate and extract the vast majority of the relevant data to the project. Working on this project overall exposed me to techniques in formal economic research including primary source data gathering, economic modeling, techniques of characterizing and understanding industrial organizations, and more.

Aside from this primary project I also aided Professor Abito on odd tasks for other projects. These included editing his new book, which analyzed the dynamics of private corporate campaigns. Specifically, the book analyzed and formally modeled private corporate campaigns, which describe cases in which companies adopt more socially responsible practices because of lobbying from consumers, interest groups, or other private entities. That is, companies adopt seemingly pro-social behavior without conventional, public regulation, but due to external, private pressure. I also aided in

gathering and summarizing literature for a project concerning repeated prisoners dilemma games, as well as one analyzing the WIC program and prices of infant formula.

In addition to working with Professor Abito, I was lucky enough to have the opportunity to work with Professor Philip Tetlock and his wife and frequent research partner Professor Barbara Mellers on a wide variety of fascinating projects. At the beginning of the summer, I was introduced by Itai Barsade to Professor Tetlock, who was in search of a research assistant. Itai had worked with Professor Mellers in the past, and so he recommended I try to work with Professor Tetlock. Triple appointed between the Department of Psychology, the Annenberg School of Communication, and Wharton, Professor Tetlock's work bridges many fields and is widely applicable. He's published roughly 200 articles in peer-reviewed journals and edited or written 10 books. Generally, his research explores challenges in assessing and promoting good judgment. His past projects have included work on forecasting tournaments and methods for evaluating and improving forecasting of future events. These have included his book *Superforecasting* and work with the IARPA for the ODNI, in which his team won their forecasting tournament (competing against other accredited research institutions) using techniques developed by Professor Tetlock and Professor Mellers. The ODNI project specifically was focused on developing improved processes for intelligence analysts to follow when making judgments about future events and is thus extremely relevant to topics in Perry World House. When I joined Professor Tetlock and Mellers this summer, I actually started with aiding them in the early stages of a follow-up project again issued by the IARPA. This project also targeted the development of processes and techniques which would aid intelligence analysts, but this time, rather than focusing on forecasting, this project dealt with counter-factual analysis. Specifically, in cases of an intelligence failure or unanticipated events, post-mortem deconstruction can be useful in realizing 'lessons learned'. However, if these retrospective deconstructions are subject to systematic cognitive bias, or the groupthink processes are otherwise flawed or inefficient, the likelihood that mistakes will be rectified falls significantly. Working closely with Professor Tetlock and Professor Mellers I finalized the draft proposal to apply to the FOCUS (Forecasting Counterfactuals in Uncontrolled Settings) project sponsored by the IARPA for the ODNI. Following the submission of the proposal, our focus shifted to planning and developing the early stages of the project in anticipation of its actual beginning. In this vein, we assembled a list of experts at Penn and elsewhere who would participate in the FOCUS tournaments once they began, and planned relevant behavior lab experiments. Additionally, to test preliminary processes prior to the beginning of the actual project, we drafted a simple game designed to simulate being a member of an economic cartel such as OPEC. Specifically, most academic literature surrounding cartels suggests that they are inherently unstable because of the high incentives to cheat or free ride off of the actions of others. This game was designed to see if certain psychological processes and techniques designed to improve 'groupthink' efficiency could lend more stability to the cartel over multiple iterations of the game. Since the conclusion of that work, this project was largely put on hold in anticipation of its formal beginning once the proposal is (hopefully) approved.

While the FOCUS project was put on hold I continued to work with Professors Tetlock and Mellers on their other ongoing projects. In these other projects, I was able to develop my technical skills in data analytics, Python, R, and Excel. For the first of these projects, I created a Python script which would randomly distribute an arbitrary number of data points with adjustable parameters, stochasticity, and correlation. The goal of this was to generate graphs of points with varying amounts of correlation which would be difficult to 'spot' when muddied by higher amounts of stochasticity. Once these graphs were generated we added an arbitrary title and axis labels designed to trick an uninformed reader to believe that the data points represented true data. The goal of this was to create graphs which would have labels that would make observers infer a higher correlation than truly existed between the points based upon their own beliefs about the supposed subject of the graph. For instance, one might see a graph labeled "family income vs. GPA" and, believing that there ought to be a correlation between these two things, estimate the correlation between the data points to be stronger than what the graphs truly reflected.

The final major project I worked on over the summer was primarily with Professor Mellers. This project was broadly investigating the ways in which political leanings affected individual's forecasting accuracy. That is, given that someone is conservative or liberal, is there a systematic impact on their ability to accurately judge the likelihood of a future event occurring. As an ongoing project, Professor Mellers had already gathered a large amount of data over the past two years. This data was essentially survey information, with individuals reporting their changing estimation of a given event happening over time until a set deadline or until that event was 'resolved'. These questions ranged from overtly political, like estimating the probability that Trump would win the election, to the seemingly random or mundane like estimating the probability that the Patriots win the Super Bowl. I was given Excel spreadsheets with tens of thousands of data points and asked to analyze the data using R. This allowed me to further develop my abilities in R, and even employ new methods of dealing with gaps or problems with a data set. Additionally, as an extension of this project, I helped develop a new set of survey questions, which focus on seeing how political affiliation and beliefs affect the ability of individuals to judge and accept relatively objective facts. For instance, given that an individual is conservative, are they prone to underestimating the number of gun-related deaths in the past decade? To this end, I drafted potential questions and provided research to justify why and how these questions would target specific ideologies, while also citing fairly objective sources to suggest there is a 'true' answer to the question.

Overall, over this past summer, I built on and expanded my skills in research, data analytical techniques, coding, and economics. Thanks to the Perry World House Summer Award I was able to successfully focus on my work and set myself up for continuing success in the future.