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## Teaching and Research Statement

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### Previous Research Experience

As an undergrad I was attracted to econometrics, specifically impact evaluations. I loved the idea of teasing out the true causal relationship between a program and its outcomes. Particularly in labor economics I admired the work done by researchers like David Card, where causal inference was used to test long established (but untested) economic theories. After my masters at Universidad de Chile I went to work on the evaluation of the largest anti-poverty program ever implemented in Chile. I got the opportunity to be part of the whole evaluation process. It was a non-experimental intervention, we used propensity score matching and Dif-in-Dif, and we put a large effort into making it as rigorous as possible: looking for exogenous variations, documenting the expected vs. true way in which the treatment was assigned, using survey and administrative data and working in the field with program managers from government. Over two years we managed to bring a substantive amount of rigor to an evaluation that (in Chile) had been largely overlooked.

After that I have participated in two other impact evaluation initiatives: doing field work for the effects of prenatal care on child outcomes in Bolivia & as co-PI assessing the effects of financial aid for higher education in Chile using a Regression Discontinuity Design on administrative data. Increasingly I became more interested on how the evidence is finally used by policy makers. Then I worked on an advisory role in the Ministry of Finance in Chile and got the privilege to experience first hand how policy makers actually use evidence to make decisions. That experience left me with two strong impressions. First, I was amazed by the amount of effort that analysts put in to producing rigorous policy analysis regardless of their political inclinations. And second, how many basic unknowns had to be investigated in an incredibly time constrained environment. Very important decisions were made based on on-the fly analyses and a large amount of “guesstimation” took place. Ever since, I struggle with the abysmal gap between work done by analysts in government (policy analysts) trying to come out with the best possible answer to a multifactorial policy issue under a stringent deadline, and analysts in academia (researchers) trying to find the best identification strategy for very specific type of intervention.

Then I came to RAND, looking for ways to make more rigorous and objective policy analysis. Impact evaluations, my original expertise, were in short supply, and so I shifted to issues of measurement and reliability. As an econometrician by training, my knowledge of these issues was almost null. Also, used to work only with economists, for the first time I had the eye-opening experience to be supervised only by statisticians. Particularly with Susan Paddock I gained a much broader appreciation for what does it mean to do rigorous quantitative assessments in social sciences. I learned to think about issues of multiple comparisons, reliability and miss-classification. From this experience I broadened my understanding of causal inference, hierarchical modeling, simulation methods, and, very importantly, R programming. These new tools would prove helpful to the development of my research agenda.

As I progress in my PhD, I became familiar with the developments in science related with the so called *reproducibility crisis*. I found that the proposed solutions could be used to bridge the gap

between the analysis made by researchers in academia and the work of policy analysts made in public policy. The core of the solution to the reproducibility crisis is to open up completely the scientific process, emphasizing norms, incentives and tools to do so. What I did for my dissertation was to translate these ideas to policy analysis, and demonstrate them in a case study. This provided a systematic approach to identify the most important unknowns in a policy analysis, a way to increase its credibility, and a living document from which the next analysis can be build upon.

## Research Goals

I want to expand the work I did in my dissertation to multiple domains of public policy. It is my view, that there is a large disconnect between the process of generating evidence and its use for decision making. Policy makers do use evidence in the form of policy reports, but as little is known about the creation of such reports, different policy makers can afford to cherry pick their information. I believe that addressing this issue could be part of the solution to the raise in *post-truth* approach to public policy.

This agenda can be expanded across and within policy issues.

The range of policy analyses that would benefit from this approach is large. In addition policies similar to the minimum wage studied in my dissertation, there are other domains where organizations are connecting evidence and policy, and adding an additional layer of transparency and reproducibility would prove beneficial. In development economics the work on systematizing cost benefit analyses done by JPAL or GiveWell are good examples. In the assessment of regulations as proposed by Michael Greenstone and Cass Sunstein. And in the process of recommending guidelines of care in medicine (USPSTF & AHRQ in the US or NICE in the UK). These are only examples and good starting points to promote an agenda of open policy analysis.

Within any given policy analysis the agenda of transparency and reproducibility can be continuously expanded. For example, the work I did on the minimum wage made a fully transparent and reproducible version of current policy analysis, but it can be extended from a micro-simulation with no behavioral responses to a dynamic discrete choice model, where agents optimize across different dimensions.

Another area for extension has to do with the user experience of the reproduced report. Up to this point it requires programming knowledge to modify/test the model, but building an interactive tool with R Shiny is a good example of a next step towards increasing the usability of the report.

Finally I want to emphasize that this agenda is meant to fit within a research group. The skills required to move it forward are a combination of economics, data science (computer science + statistics) and policy specific knowledge, all in an environment that embraces and supports open science. My training and experience have prepared me to contribute to and learn from such environment. I look forward to join others in the endeavor of connecting research and policy.

## Teaching Statement

I taught undergraduate econometrics for three semesters in the past. I have also done multiple teaching assistantships, and work as a tutor for undergraduate and graduate courses in economics and statistics. There are two aspects that I really enjoy about teaching: it forces me to thoroughly learn and relearn the material, and it allows me to have a direct impact on the way other people think and learn. From my previous experience I have found both aspects to be extremely time consuming and gratifying when perform well. I look forward to teach again.

As I learned and adopt practices to do open and reproducible research, I would like my lectures to follow a similar format. I learn and taught econometric in Stata, but I believe that nowadays is

more appropriate for students to be trained in R. It is open source, it has a growing and vibrant community and its increasingly embraced across disciplines. If possible, I would like the material of my courses to be publicly accessible, and use Github to interact with my students. Finally I would like to teach courses that already have great lecturers available online, I find the challenge of improving upon their work and/or guiding my students through their material, highly stimulating.

In addition to my previous course, where I used Stock and Watson Introductory textbook, I am well prepared to take the challenge of teaching the following courses (course title/textbook/online benchmark):

- Introduction to Probability/ Blitzstein & Hwang 2015/Stat 110 (Harvard)
- Bayesian Statistics/ Statistical Rethinking 2015/ ANT 291 (UC Davis)
- Introduction to Econometrics/ Mastering Metrics 2015
- Econometrics/ Mostly Harmless Econometrics 2008
- Research Transparency Methods in the Social Sciences/papers/Econ 270D (UC Berkeley)
- Essential Books for Policy Analysis/ Manski (2013), Kahneman (2011), Gawande (2009), Tetlock (2015), Sunstein (2013), Mullainathan (2013).