Kelli Marquardt
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Department of Economics
University of Arizona
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EDUCATION

University of Arizona
Ph.D. candidate in Economics 2016-(2021)
Fields: Labor, Industrial Organization, with an emphasis in Health

University of Dayton
Bachelor of Science: Applied Mathematics and Economics 2012-2016

PhD COURSES

Course Name	Instructor	Term
Microeconomic Theory: Consumer Choice	Asaf Plan	Fall 2016
Microeconomic Theory: General Equilibrium	Mark Walker	Fall 2016
Mathematical Economics	Mark Walker	Fall 2016
Theory of Quantitative Methods in Economics	Satheesh Aradhyula	Fall 2016
Teaching Methods in Economics	John Drabicki	Fall 2016
Microeconomic Theory: Game Theory	Julian Romero	Spring 2017
Dynamic Economic Analysis	Asaf Plan	Spring 2017
Applied Economic Analysis	Price Fishback	Spring 2017
Econometrics I	Tiemen Woutersen	Spring 2017
Econometrics II	Gary Solon	Fall 2017
Labor Economics I	Gary Solon	Fall 2017
Industrial Organization & Regulation I	Stan Reynolds	Fall 2017
Labor Economics II	Jessamyn Schaller	Spring 2018
Industrial Organization & Regulation II	Mo Xiao	Spring 2018
Epidemiology Seminar	Kate Ellingson	Spring 2018
Statistical Computing	Walter Piegorsch	Spring 2018
Economic Modeling II: Dynamic Modeling	Gautam Gowrisankaran	Fall 2018
Applied Economic Analysis	Mo Xiao	Fall 2018

RESEARCH ASSISTANTSHIPS

Gautam Gowrisankaran, University of Arizona (Economics) Fall 2018
Bill Eddy, Carnegie Mellon University (Statistics) Summer 2015
John Ruggiero, University of Dayton (Econometrics) 2014-2016

TEACHING EXPERIENCE

Sole Instructor

BNAD 276: Statistical Inference in Management	Summer 2018
ECON 200: Basic Economic Issues	Summer 2017

Teaching Assistant

ECON 522A: Econometrics I	Fall 2018
ECON 522B: Econometrics II	Spring 2018
BNAD 301: Global and Financial Economics	Spring 2018
ECON 150: Economic Perspectives	Fall 2017
ECON 200: Basic Economic Issues	2016-2017

RESEARCH IN PROGRESS

"**Nobody Puts Baby in the Corner: The Effect of Parental Employment and Marital Status on Child Mental Health**"

Abstract: Medical research finds that genetics as well as environmental factors play a role in the development of child mental health conditions. This paper asks which potential environmental factors have short-run effects on child mental health, particularly focusing on parental job loss, marriage, divorce, and death. Using 20 waves of the Medical Expenditure Panel Survey and a child fixed effects model, I find that children are more likely to speak to a psychologist following a parental divorce. Furthermore, a parental divorce or parental death is associated with an increase in the short-run likelihood of diagnosis for depression and anxiety but a decrease in the likelihood of diagnosis for ADHD, which suggests potential issues of physician misdiagnoses. These findings have potential policy implications as child mental health conditions are directly and indirectly costly to families and are likely to follow the child into adulthood. If more is known about the environmental causes of child mental health conditions as well as triggers of diagnoses, then more can be done regarding mental health prevention and appropriate care.

"Booms, Busts, and Birth Rates Over the Long Run: Changes in the relationship between aggregate fertility and economic conditions over the 20th century" with Jessamyn Schaller and Price Fishback

CONFERENCE PRESENTATIONS

Midwest Economics Association Undergraduate Paper Competition- April 2016
Presented Undergraduate Thesis Project: "Comparison of Nonparametric and Parametric Estimations of Hospital Production Functions used for Hospital Efficiency Analysis"

HONORS, FELLOWSHIPS AND GRANTS:

University of Arizona Thomas R. Brown Fellow, 2016-2017
Dr. John Rapp Research Scholar, 2015-2016

THE UNIVERSITY OF ARIZONA

Gautam Gowrisankaran
APS Professor of Economics
Department of Economics
Eller College of Management

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September 21, 2018

To the Health Economics Boot Camp Review Committee:

Dear Ben, Kate, and Jon,

I write to you with a recommendation letter for Kelli Marquardt for the Health Economics Boot Camp. Kelli is in her third year of our PhD program at the University of Arizona. She recently started working for me as a research assistant on my NSF and AHRQ grants. She has completed a very competent second year paper on health economics. She has concrete plans to pursue a number of ambitious topics on healthcare in her ongoing research.

In my opinion, Kelli is a very strong candidate for the Boot Camp. She is one of our best graduate students at the University of Arizona, in terms of her performance on classes and in the general opinion of faculty as to her motivation and intellect. I chose her as my research assistant for this reason and she has performed excellently to date, being proactive in helping me and in developing new skills. I have been impressed with her intellect, her dedication to hard work, her willingness to learn, and her passion for understanding problems in health economics. I think that the Boot Camp would complement the skills that she is learning at the University of Arizona and also help her become part of the larger network of young scholars working in this area.

Let me touch briefly on Kelli's research. Kelli has completed a paper that considers the relation between family status and mental health diagnoses, using the MEPS data. Kelli investigates how events such as parental divorces, deaths, marriages, and job losses relate to diagnoses for a variety of mental health conditions among children. Kelli has several interesting findings here, that show that events such as a parental divorce leads to more psychologist visits and mental health diagnoses for children. In my opinion, this research demonstrates that Kelli can perform careful research on empirical health economics topics of interest.

For her dissertation, Kelli plans to diversify beyond the above paper topic and work on two related areas that more directly evaluate healthcare for children's mental health illnesses, on the diagnosis and treatment of mental illnesses for children, specifically for ADHD. Kelli has started on two separate research projects that consider these two dimensions in turn. She is close to securing novel and useful datasets that will help add value on these topics. Specifically, she has been working with a senior administrator from our medical school, Beth Calhoun, to obtain electronic health records dataset that she plans to use in this area. Let me describe both topics.

First, Kelli plans to use detailed data from all the electronic medical records from what was the University of Arizona Health System in order to understand when and how physicians learn to

diagnose children's mental illnesses correctly. Kelli's idea here is to combine text on patient conditions from physician visits, as recorded in the electronic health records, with practice guidelines that define ADHD diagnoses. She would use current "big data" methods here to evaluate a score for each physician on her compliance with these guidelines. For this part of her project, Kelli was motivated by a professor in Arizona's MIS department, Gondy Leroy, who uses big data methods to perform text mining in the context of healthcare. Her computation of the score will build on Prof. Leroy's work. Kelli's idea is then to measure when physicians appropriately follow guidelines in diagnosing ADHD. For instance, do physicians with more experience follow diagnostic guidelines more? When physicians join a practice, do they learn from physicians around them on how to follow diagnostic guidelines? Do child psychologists follow guidelines more than family physicians?

Second, Kelli plans to estimate a learning model of physician treatment for mental illnesses to evaluate how physicians learn about which medications to prescribe for ADHD and also when and whether to refer patients to specialists, conditional on a pediatric diagnosis of ADHD. Here, Kelli plans to build on Crawford and Shum (2005)'s Econometrica paper on physician learning. Specifically, following Crawford and Shum, Kelli proposes to estimate a learning model where physicians understand that there are patient-specific valuations for different drugs and from specialist therapy, and choose drugs to maximize the consumers' expected discounting future valuations.

In sum, I believe that Kelli Marquardt is working on a number of important areas of research in health economics. She would benefit from the Boot Camp to help round out and solidify her knowledge of health economics topics and also to interact with other young scholars who are working on similar issues.

Please let me know if you have any further questions about Kelli Marquardt. Ben, you will get a chance to meet her when you visit the University of Arizona in early October. I hope this will help you make an accurate assessment of her candidacy.

Sincerely yours,



Gautam Gowrisankaran

September 22, 2018

Dear Ben Handel, Katherine Ho, and Jonathan Kolstad,

I am pleased to submit my application for the NBER Health Economics Research Boot Camp for Graduate Students. I am a PhD candidate in economics at the University of Arizona, and I am currently in my third year (5th semester) of graduate studies with an expected completion date of May 2021.

I believe I am a strong candidate for this research-focused workshop as I have a great interest in health economics, yet I am still somewhat new to conducting independent research in this field. I am currently finishing up my first graduate research project in which I analyze the effects of parental employment and marital status changes on child mental health outcomes. In future work, I hope to expand on child mental health in general and analyze the role of physicians in diagnosis and prescription drug treatment. I believe that I would benefit greatly from this health economic research workshop so that I can learn the techniques, the resources, and the innovative ideas from top active researchers in this field.

I have attached my CV along with the application essay. I can be contacted either by email (marquardtk@email.arizona.edu) or by phone at (303) 257 -0536.

A letter of recommendation will be provided by Gautam Gowrisankaran (gautamg2@gmail.com).

Sincerely,

Kelli Marquardt
PhD Candidate in Economics
University of Arizona
(303) 245-0536
marquardtk@email.arizona.edu

NBER Health Economic Bootcamp Application Essay

Kelli Marquardt
University of Arizona

I would be honored to be selected to participate in the NBER Health Economic Bootcamp this December. This would be a priceless experience in which I would be able to learn from top level researchers in the field and exchange ideas and collaborate with dedicated peers. I believe I am strong candidate for a participant in this program as I am a 3rd year economic PhD candidate at the University of Arizona with an interest in pursuing a research career in health economics. While the University of Arizona has some faculty members who conduct health economic research, namely Gautam Gowrisankaran and Jessamyn Schaller, the PhD program does not offer a field or classes in health economics. Thus, in order to understand my field of interest, I have spent time taking classes in public health, consulting with the economic faculty that conduct research in health, and reading a large number of health economic academic papers. Attending this workshop would add substantially to my learning of health economics and would be a hugely beneficial experience for me to further explore the field and learn techniques, ideas, data sources, and models from a variety of top-level health economic researchers.

Ever since I decided to a pursue a career in economic research, I knew that I wanted my work to have a health application. It wasn't until the end of my second year of graduate school, however, that I started working on a substantial independent health research project. In the working paper, titled "Nobody puts baby in the corner: the effects of parental employment and marital status on child mental health", I use Medical Expenditure Panel Survey (MEPS) data and apply a linear probability model with child fixed effects to study the effect of parental changes (job changes, job loss, marriage, divorce, and death) on the likelihood of child mental health diagnoses. Though hard to argue causality, the descriptive nature of the paper still has some interesting results. For example, I find that parents are more likely to take their child to see a psychologist immediately following a parental divorce but not following any of the other parental changes in the analysis. Further, I find that following a parental divorce or a parental death, a child is significantly more likely to be diagnosed with depression and anxiety, but significantly less likely to be diagnosed attention deficit hyperactivity disorder (ADHD). I explore potential mechanisms and find that these changes in diagnoses rates are not due to changes in health insurance access but rather due to either stress changes in the child or changes in attention from the parents and/or medical professionals.

The puzzling result from the paper above is that the likelihood of ADHD diagnosis falls following a parental death, which I believe may suggest physician misdiagnosis issues. Since symptoms of mental health conditions often overlap, it could be the case that when a physician knows that a child's parent has died, they are more likely to associate the symptoms with anxiety or depression, whereas if the child did not have a parental death, they would have been diagnosed with ADHD. This interesting result, along with that found in Elder (2010), makes me question the diagnosis changes across time and space for the ADHD condition. Thus, in my future research, I plan to explore this condition further.

I am currently working on solidifying the idea for my next research paper in which I consider the ADHD diagnosis decision of physicians. Using an analysis similar to Currie et al. (2016), I plan to determine physician 'diagnosis style' for this condition. In particular, I will first rank patients on their level of "appropriateness" of diagnosis through text-search of symptom lists and other patient characteristics. Following, I will model the physician diagnosis decision as a function of these patient rankings to determine which physicians pay close attention to individual patient characteristics and follow national diagnosis guidelines in their decision process. After obtaining the estimated diagnosis style, I can then answer a variety of questions such as whether patients select into physicians and if physician demographic characteristics or clinic structures influence diagnostic behavior.

Following the diagnosis for ADHD is the decision of treatment for the condition. Thus, I am also interested in expanding the above analysis to include a study of prescription drugs used in treatment for ADHD. In particular, I plan to build on the model developed by Crawford and Shum (2005) in which there is uncertainty of patient-drug match values that physicians can learn about through experimentation over time. I will expand on the model by allowing for different physician diagnostic skill and including an additional option of referring the child to therapy from a specialist. With my model, I hope to determine how quickly physicians learn of patient-drug match values and when they decide to refer a child to a specialist. In addition, I can consider a counterfactual analysis that eliminates uncertainty of match values, which I believe resembles where the field of medicine is going due to major advances is pharmacology. I am currently in the process of obtaining electronic health record data (EPIC) from Arizona Banner Health centers in order to further explore these ideas.

I find all of these questions interesting and important, but ultimately the feasibility of these depend on two things: 1- the health data that I can get access to and 2- the knowledge that I can obtain regarding different models and methods of analysis in health economics. I believe that attending the NBER Health Economic workshop would be a huge asset to my learning and help me reach my research goals. I am very excited by the list of health economic researchers presenting. I believe there will be a wide range of things to learn in this workshop such as applications of behavioral economics, the effects of current health insurance market changes, models of hospital mergers, work relating to the prescription drug market, and much more. I would be honored to be selected to attend the NBER health economic research workshop, to learn about what top health economists are researching, and to take part in the discussion on where this field is going.

Crawford, G.S. and Shum, M., 2005. Uncertainty and learning in pharmaceutical demand. *Econometrica*, *73*(4), pp.1137-1173.

Currie, J., MacLeod, W.B. and Van Parys, J., 2016. Provider practice style and patient health outcomes: the case of heart attacks. *Journal of health economics*, *47*, pp.64-80.

Elder, T.E., 2010. The importance of relative standards in ADHD diagnoses: evidence based on exact birth dates. *Journal of health economics*, *29*(5), pp.641-656.