NBER Digitization Grant Proposal

Online Information and Pharmaceutical Markets

Claudia Allende, Columbia University
Zach Y. Brown, NBER and University of Michigan

Abstract

We plan to examine the introduction of an innovative online platform that provides real-time information about pharmaceutical prices and substitutes in Chile. We are interested in how individuals use the website, how it changes their beliefs, and how it affects pharmaceutical markets. In particular, we plan to examine whether easy-to-use and personalized online information can make markets more competitive and lower drug prices. Working with the Ministry of Health of Chile, we will have detailed administrative data on website usage and the entire pharmaceutical supply-chain. Given that the full website will likely be rolled out in the coming months, we will also have the opportunity to be involved in its implementation.

Proposal

A growing literature has examined whether digitization and the internet can make markets more competitive by decreasing information frictions. Information frictions are particularly severe in health care markets. It is often very difficult to comparison shop for pharmaceutical drugs since prices are opaque and patients may be unaware of lower-prices substitutes. Due to these search frictions, there is often a high degree of price dispersion in pharmaceutical markets (e.g. Sorensen 2000). However, digital innovations that address these issues have been slow to emerge, as industry regulations[1] create significant barriers to entry for the new digital marketplaces which have played a key role in lowering information asymmetries and reducing search costs in other industries. This is particularly important because both health care and pharmaceutical prices are rising rapidly. In recent work, one of us has examined the equilibrium effects of health care price information in the US (Brown 2018a,b), however, there is still little evidence on how to make drug markets more competitive.

Chile has been at the forefront of efforts to use digital tools to reduce information frictions. For instance, one of us is currently examining efforts to increase information related to school choice in order to understand the implications for competition (Allende, Gallego, Neilson 2018). In May 2018, the government launched www.tufarmacia.gob.cl, a preliminary website providing the average price of pharmaceutical drugs for different pharmacy chains. In the coming months, the President wishes to expand the website to provide real-time prices for each individual pharmacy, as well as supermarkets and other small neighborhood stores selling over-the-counter drugs.

We have an ongoing relationship with the Undersecretary of Public Health of Chile, Paula Daza, who is enthusiastic about working with us to evaluate the effect of the website and is willing to share relevant data. In addition to detailed data on pharmaceutical prices, there is also detailed

[1] As in many countries, the pharmaceutical industry in Chile is highly regulated in terms of who and how drugs are sold.

cost information on the entire vertical chain (including intermediaries) using firm-to-firm transactions from VAT records. One of us is currently using these data for another project. In addition, the Ministry of Health is open to sharing website usage data and adding short surveys to the website to collect information about beliefs prior to receiving information. They are also open to experimenting with different ways of presenting information, including personalized information, in order to further reduce information frictions. To facilitate usage of the website, the Ministry of Health is also interested in randomizing the availability of the website across local markets and interventions such as getting health workers to refer patients to the website.

The first part of the analysis will examine usage of the website, and how to reduce information frictions once individuals are already on the website. We are particularly interested in whether machine learning tools can be used to predict what information will be most valuable. Next, we will evaluate the causal effect of the website on pharmaceutical spending patterns, examining both the demand-side and supply-side effects. We also plan to examine the effect on wholesale drug prices. We will also examine effects on drug adherence and health outcomes. This analysis will exploit time variation in availability of the website as well as any interventions aimed at increasing take-up. Finally, we plan to use structural methods to examining the welfare implications of a reduction in search frictions, as well as the more general implications for health care markets.

Funds for this project will support a research assistant in Chile, which is necessary since some of the administrative data can only be accessed from government offices. It will also support travel expenses associated with meeting government officials and presenting at conferences.

This project has important implications for controlling drug costs in other countries. In the US, Medicare drug costs have been rising at 10 times the rate of inflation over the last five years.[2] In many other countries, including Chile, drug costs are becoming prohibitively expensive for patients, with serious consequences for public health. If rents are primarily going to intermediaries, such as pharmacies and wholesalers, high pharmaceutical spending is doing little to incentivize drug innovation. By leveraging digital innovations, we believe that this project can shed light on these understudied issues and the implications for the design of public policies to make pharmaceutical markets more competitive.

References

Allende, Claudia, Francisco Gallego and Christopher Neilson. "Information Frictions and School Choice: Evidence from a Quality Disclosure Policy", working paper, 2018.

Brown, Zach. “An Empirical Model of Price Transparency and Markups in Health Care, working paper, 2018.

Brown, Zach. “Equilibrium Effects of Health Care Price Information”, Accepted, Review of Economics and Statistics, 2018.

Sorensen, Alan T. "Equilibrium price dispersion in retail markets for prescription drugs." Journal of Political Economy 108.4 (2000): 833-850.

[2] See “Manufactured Crisis: How Devastating Drug Price Increases Are Harming America’s Seniors,” US Senate, 2018.

NBER Digitization Grant Proposal Budget

Researchers	Claudia Allende (Columbia) and Zach Y. Brown (NBER and Michigan)
Title of Fund proposal	Online Information and Pharmaceutical Markets
Start Date	7/1/18
End Date	7/1/19

Budget Line Items		NOTES
Travel (PI, etc)	**4,244.00**	
Flights, accommodation, per diem		
Flights	3,600.00	2 flights per researcher (2) for meetings, coordination, and overview of the project.
Per diem	644.00	
Materials and Supplies at University	**0.00**	
Field Costs	**6,000.00**	
Personnel (salary, benefits, computers)		
Research assistant in Chile	6,000.00	Assist with accessing restricted information in Chile and interacting with government officials
Personnel at University (PIs, PMs, RAs)	**4,756.00**	
Position/FTE/Annual Base Salary		
Research assistant	4,756.00	Assist with data analysis
Total Budget	15,000	

Zach Y. Brown

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Cambridge, MA 02138

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Employment

National Bureau of Economic Research
Post-Doctoral Fellow in Aging and Health Research, 2017–2018

University of Michigan
Assistant Professor of Economics, 2018

Education

Ph.D., Department of Economics, Columbia University, 2017

B.A., Department of Economics (physics minor), U.C. Berkeley, 2007

Research

Working Papers
"An Empirical Model of Price Transparency and Markups in Health Care," 2018.

Published and Forthcoming
"Equilibrium Effects of Health Care Price Information," Accepted, *Review of Economics & Statistics*. 2018.

Other Experience

Staff Economist, Council of Economic Advisers, Washington D.C., 2014–2015

Analyst, Cornerstone Research, San Francisco, CA, 2008–2010

Honors and Awards

Post-Doctoral Fellow, National Bureau of Economic Research, 2017-2018

Dissertation Fellowship, Department of Economics, Columbia University, 2015-2016

Faculty Fellowship, Department of Economics, Columbia University, 2014

National Science Foundation Graduate Research Fellowship, 2011-2013

Presentations

2017: University of Washington (Economics), University of Michigan (Economics), University of Wisconsin (Economics), University of Pennsylvania (Wharton), University of Massachusetts Amherst (Agriculture and Resource Economics), INSEAD (Marketing), University of Illinois at Urbana-Champaign (Economics), NBER Insurance Working Group, Princeton University (Economics), Federal Trade Commission

Refereeing

Econometrica; *Economics & Politics*; *Journal of Economics & Management Strategy*; *Journal of Industrial Economics*; *Review of Industrial Organization*

Teaching

Teaching assistantships, graduate level:

Microeconomics, School of International and Public Affairs, Columbia University (*Summer 2012, Summer 2013*)

Teaching assistantships, undergraduate level:

Industrial Organization, Department of Economics, Columbia University (*Fall 2012, Fall 2015, Spring 2016*)

Econometrics, Department of Economics, Columbia University (*Spring 2015*)

Development Economics, Department of Economics, Columbia University, Spring 2013 (*Spring 2013*)

Empirical Methods for Undergraduate Thesis, Department of Economics, Columbia University (*Fall 2013*)

Claudia Allende SC

Contact Information

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Columbia University
New York, NY

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Research Interests

Industrial Organization, Labor Economics, Development Economics

Education

Columbia University, Teachers College 2014 - present

Ph.D. in Economics and Education

Princeton University, Economics Department 2016 - 2017

Visiting Ph.D. Student (Supervisor: Prof. Christopher Neilson)

Pontificia Universidad Católica de Chile

M.A. in Economics (Concentration: Industrial Organization) 2011 - 2012
B.A. in Business and Economics 2006 - 2011

Research Experience

Princeton University, Princeton, NJ
Research Assistant to Professor Christopher Neilson Summer 2015

Pontificia Universidad Católica, Santiago, Chile
Research Assistant to Prof. Jeanne Lafortune (Economics) Fall 2012 - Spring 2013
Research Assistant to Prof. Juan Pablo Montero (Economics) Spring 2012
Research Assistant to Prof. Francisco Gallego (Economics) Spring 2011, 2012

Research

Working Papers

"Information Frictions and School Choice: Evidence from a Quality Disclosure Policy", with Francisco Gallego (PUC) and Christopher Neilson (Princeton)

"The Equilibrium Effects of Information Interventions" with Francisco Gallego (PUC) and Christopher Neilson (Princeton)

Work in Progress

"Supply Side Responses to Parents Preferences for Peers"
Data Science Award - Microsoft Research

"Biased Beliefs and Search in Education Markets",
with Christopher Neilson (Princeton). *Pilot completed. Project funded. In the field.*

"Dynamic Investments in human Capital and the Role of Information in College Choice "
with Magdalena Bennett (Columbia, TC). *Project funded by JPAL-PPE.*

"Cheating on Teachers' Incentives: Testing for Different Mechanisms"

Teaching Experience

Columbia University, New York, NY

Teaching Assistant

Topics in Economics and Education (Graduate) Spring 2018
Economics and Education (Graduate), Teachers College Fall 2015

Pontificia Universidad Católica, Santiago, Chile

Instructor 2013 - 2014

Principles of Economics

Teaching Assistant 2008 - 2011

Graduate: Macroeconomic Theory, Micreoeconomic Theory.

Undergraduate: Advanced Micro I (x3), Advanced Micro II (x2), Advanced Macro I, Trade, Industrial Organization.

Other Professional Experience

Antitust Agency. Santiago, Chile 2011 - 2013

Economic Advisor

Ministry of Education. Santiago, Chile 2013 - 2014

Advisor to the Minister of Education.

Awards, Honors and Grants

Burke Scholarship Award - Columbia University	2018
Education Policy Dissertation Research Fellowship - Columbia University	2018
Research Award: Data Science - Microsoft Research (USD 20,000)	2018
PPE Innitiative Pilot Grant - J-PAL (USD 43,000)	2018
Student Travel Award (x2) - Columbia University	2018
Fieldwork Pilot Funds - IR Section, Princeton University (USD 30,000)	2017
Student Travel Award - Columbia University	2015
Conicyt Scholarship (application graded with the maximum score)	2014 - 2018
Academic Excellece Award, M.A. in Economics, PUC-Ch	2012
Academic Excellence Scholarship, PUC-Ch (highest GPA, Business and Econ)	2010
Academic Excellence Scholarship, PUC-Ch (top entering student, Business and Econ)	2006
Highest National Score, Mathematics, University Entrance Exam (PSU)	2005
Finalist in the National Mathematical Olympiad	2004

Conferences and Presentations

Columbia University, Economics Department 2018

Applied Micro Theory Colloquium
Industrial Organization Colloquium

JPAL-LAC: Research Opportunities for the Human Development 2017

Columbia University, Economics Department

Industrial Organization Colloquium

Columbia University, Teachers College

Economics and Education Seminar

Princeton University, Economics Department

Industrial Relations Section - Education Research Seminar

Northwestern University, Economics Department 2016

Empirics and Methods in Economics Conference

Princeton University, Economics Department

EconCon Economics Students Conference
Industrial Relations Section - Education Research Seminar

Columbia University, Teachers College

Economics and Education Seminar

Columbia University,Teachers College 2015

Economics and Education Seminar

Harvard University, Graduate School of Education

20th Annual Student Research Conference

XI Iberoamerican Antitrust Seminar. Madrid, Spain 2013

Pontificia Universidad Católica de Chile, Economics Department 2012

Applied Micro Seminar

Chilean Economics Society (SECHI). Viña del Mar, Chile

Annual Meeting

Software Skills

Advanced user of Matlab, Julia, Stata and LaTeX
Intermediate user of Python and R

Other Activities

Structural Dynamic Models and Machine Learning. University of Copenhagen May 2018

Summer School and Conference

NBER Economics of Digitalization. Stanford University Febraury 2018

Tutorial and Conference

Microsoft Research Hackathon. Cambridge, MA July 2017

Project: *"Students' Futures at Risk: Improving Centralized School Assignment in Chile Using Machine Learning"*.
Team lead by Christopher Neilson, Greg Lewis and Vasilis Syrgkanis.

Reading Groups at Columbia University

Industrial Organization Summer 2017
Market Design Spring 2017

Other

Languages: Spanish (native), English (Fluent)
Nationality: Chilean

References

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