

# Estimating the Heterogeneous Welfare Effects of Choice Architecture: An Application to the Medicare Prescription Drug Insurance Market

*By* JONATHAN D. KETCHAM, NICOLAI V. KUMINOFF AND CHRISTOPHER A. POWERS\*

Decision support tools, menu restrictions, and default options are examples of choice architecture—the design of the market environment in which consumers make decisions. Policies that modify choice architecture can create winners and losers. Some people may benefit if the policy mitigates constraints on their decision making such as search costs, switching costs, and psychological biases. Other people may lose if the new architecture eliminates their preferred options, provides incomplete information, or exacerbates externalities generated by the equilibrium sorting process.

In this article we develop, estimate and validate structural models and use them to estimate the heterogeneous welfare effects of prospective modifications to choice architecture. We apply this approach to the Medicare prescription drug plan (PDP) market. We accomplish this by relying on a novel combination of the Medicare Current Beneficiary Survey, CMS administrative data on PDP enrollment decisions and prescription drug claims from 2006-2010 and a cost calculator (Ketcham, Lucarelli and Powers, 2015) to estimate each persons' counterfactual spending under each available plan.

We begin by implementing the approach proposed by Bernheim and Rangel (2009) and use ancillary information to discern which choices to respect and which to suspect may not reveal consumers' fully-informed preferences. Our definition of suspect choices is based on whether the person lacked basic knowledge about the PDP market and whether they chose a plan that was inferior in cost, risk protection and quality. As in Chetty et al. (2015) our identification of suspect choices also distinguishes between active and passive choice processes. Suspect choices potentially reduce welfare because of the divergence between the decision utility (DU) people use to guide their choice process and the hedonic utility (HU) they derive from the post-purchase consumption of the good or service (Kahneman, Wakker, and Sarin 1997).

---

\* Ketcham: Arizona State University, Department of Marketing, Box 874106, Tempe, AZ 85287-4106 (e-mail: Ketcham@asu.edu). Kuminoff: Arizona State University, Dept. of Economics, Tempe, AZ 85287 (e-mail: kuminoff@asu.edu). Powers: U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, Center for Strategic Planning / DDSG, 7500 Security Boulevard, Mailstop C3-24-07, Baltimore, MD 21244 (e-mail: Christopher.Powers@cms.hhs.gov). Ketcham and Kuminoff's research was supported by a grant from the National Institute for Health Care Management (NIHCM) Research and Educational Foundation. The findings do not necessarily represent the views of the NIHCM Research and Education Foundation.

We then estimate choice models separately for suspect and non-suspect choices. We use the estimates from non-suspect choices to serve as the HU function for all consumers, so that any observed deviations between that function and the DU estimated for suspect choices potentially reduce welfare. We build on Small and Rosen (1981) and Leggett (2002) to adapt the standard multinomial logit welfare framework to incorporate the possibility of welfare losses from poor information and psychological biases. This framework allows us to consider the average welfare effects as well as how the welfare effects vary across people with different observable attributes and using different choice processes.

With this adapted welfare measure we implement Camerer et al. (2003)'s proposal to evaluate the relative merits of prospective policies based on a criterion that quantifies asymmetric paternalism: producing large benefits for people making suspect choices while imposing little or no harm, and perhaps even benefiting, people making non-suspect choices. We estimate the average welfare effects and assess who wins and who loses from three specific prospective policies proposed in Camerer et al. designed to simplify the market and mitigate consumer confusion: (1) providing personalized information, (2) establishing a low cost default option, and (3) reducing the number of PDPs. In the first policy experiment, we calibrate our model to replicate the treatment effect observed by Kling et al. (2012) in a field experiment in which enrollee were sent personalized letters with information on the amount of money they could expect to save by switching to their lowest-cost plans. In the second and third policy experiments, we calibrate our model to match the federal government's recent proposals to establish low cost defaults and to limit each insurer to sell no more than two plans per region (Federal Register 2014, Health and Human Services 2014).

Our approach allows these policies to affect welfare through numerous heterogeneous pathways: by altering the choice process so that the DU parameters of those making suspect choices converge to those of non-suspect choosers; by eliminating preferred plans; by reducing or increasing switching costs including due to government nudges relying on imperfect information; and by altering the premiums of the available plans. To incorporate the premium adjustments, similar to Bayer and Timmins (2005) and Bayer, Ferreira, and McMillan (2007) we solve for the counterfactual premiums that would arise from the

sorting behavior reflected in our estimated models of DU conditional on maintaining the insurers' net revenues observed under the status quo. An important assumption in the welfare analysis is the extent to which the implied value for status quo brands and plans enters HU or instead represents psychological biases that enters only DU. Regardless of this assumption, our results show that all policies have winners and losers. Restricting choice sets reduces welfare on average and for a majority of people, whereas information provision and defaults benefit the average enrollee as well as taxpayers, primarily through transfers from insurers.

### **References**

- Bayer, Patrick, Fernando Ferreira, and Robert McMillan. 2007. "A Unified Framework for Measuring Preferences for Schools and Neighborhoods." *Journal of Political Economy*, 115(4): 588-638.
- Bayer, Patrick and Christopher Timmins. 2005. "On the Equilibrium Properties of Locational Sorting Models." *Journal of Urban Economics*, 57(3): 462-77.
- Bernheim, B. Douglas and Antonio Rangel. 2007. "Toward Choice-Theoretic Foundations for Behavioral Welfare Economics." *American Economic Review Papers and Proceedings*, 97(2): 464-470.
- Camerer, Colin, Samuel Issacharoff, George Lowenstein, Ted O'Donoghue, and Matthew Rabin. 2003. "Regulation for Conservatives: Behavioral Economics and the Case for "Asymmetric Paternalism"" . *University of Pennsylvania Law Review*. 151(3): 1211-1254.
- Chetty, Raj, John N. Friedman, Soren Leth-Petersen, Torben Heien Nielsen, and Tore Olsen. 2015. "Active vs. Passive Decisions and Crowd-Out in Retirement Savings Accounts: Evidence from Denmark". *Forthcoming in the Quarterly Journal of Economics*.
- Federal Register. 2014. "Policy and Technical Changes to the Medicare Advantage and the Medicare Prescription Drug Benefit Programs for Contract Year 2015 (CMS-4159-P)." January 10.
- Health and Human Services. 2014. "Proposed HHS Notice of Benefit and Payment Parameters for 2016 Fact Sheet. November 20, 2014.
- Kahneman, Daniel, Peter P. Wakker, and Rakesh Sarin. 1997. "Back to Bentham? Explorations of Experienced Utility." *Quarterly Journal of Economics* 112(2): 375-405.
- Ketcham, Jonathan D., Claudio Lucarelli, and Christopher Powers. 2015. "Paying Attention or Paying Too Much in Medicare Part D." *American Economic Review*. 105(1): 204-233.
- Leggett, Christopher G. 2002. "Environmental Valuation with Imperfect Information". *Environmental and Resource Economics*. 23: 343-355.
- Small, Kenneth A. and Harvey S. Rosen. 1981. "Applied Welfare Economics with Discrete Choice Models." *Econometrica*. 49(1): 105-130.