

A Dynamic Model of Location Choice and Hedonic Valuation, *Job Market Paper*

Hedonic equilibrium models recover willingness-to-pay for spatially delineated amenities by using the notion that individuals “vote with their feet.” However, the hedonic literature (and, more recently, the estimable Tiebout sorting model literature) has largely ignored both the costs associated with migration (financial and psychological), as well as the forward-looking behavior that individuals exercise in making location decisions. Each of these omissions could lead to biased estimates of willingness-to-pay. Building upon the dynamic migration models from the labor literature, I estimate a fully dynamic, national model of individual migration that explicitly controls for moving costs and forward-looking behavior. By employing a two-step estimation routine, I avoid the computational burden associated with the full recursive solution; I can then include a richly-specified, realistic state space. I find that including dynamics has a significant positive impact on the estimates of a willingness to pay for air quality. With this model, I am able to perform non-market valuation exercises and learn about the spatial determinants of labor market outcomes in a dynamic setting. Including dynamics has a significant positive impact on the estimates of a willingness to pay for air quality. In addition, I find that location-specific amenity values can explain important trends in observed migration patterns in the United States.

Recovering the Willingness to Pay to Avoid Ozone: How Panel Data Can be Used to Easily Estimate Hedonic Demand Functions, *with Christopher Timmins*

Over the last thirty years, property value hedonics have become commonplace in the non-market valuation of environmental amenities. This has happened despite a number of well-known problems with the technique. Bajari and Benkard (2005) describe one of these problems; the traditional “two-step” approach to estimating preferences proposed by Rosen (1974) places strict constraints on individual heterogeneity in willingness-to-pay. This problem becomes more severe as one is forced to further restrict preferences in order to solve the endogeneity problems described by Epple (1987). Bajari and Benkard propose a “preference inversion” procedure for recovering individual-specific measures of willingness-to-pay. However, with typically available data, their proposed measure of willingness-to-pay suffers from a number of unrealistic constraints (*e.g.*, willingness-to-pay cannot vary with the level of the amenity). In this paper, we show how panel data describing repeat house sales, along with repeat purchase decisions by individual home buyers, can be used to relax these constraints and flexibly estimate willingness-to-pay functions. Using data on ozone pollution in the Bay Area of California, we find evidence of significant heterogeneity in willingness-to-pay and in the elasticity of willingness-to-pay with respect to both ozone and non-housing expenditures. This heterogeneity has important consequences for the valuation of non-marginal changes in ozone. In ongoing research, we explore how a “synthesized panel” (created using matched individuals from multiple markets) might be similarly used to relax functional form constraints while recovering the individual heterogeneity allowed by Bajari and Benkard’s approach.