

# Instrument-free structural estimation of the nursing home market under entry-exit actions

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## Abstract

This research introduces a novel approach for estimating the structural parameters of demand, cost, and entry costs in a differentiated products model where product characteristics and input cost data are not observed for non-entrants. Traditional methods for entry game estimation rely on the product characteristics that are used as instruments to be observable for both entrants and non-entrants — a scenario that is uncommon in practice. I first provide an extension of the standard identification strategy that does not require such observability condition, but also demonstrate based on identification analysis as well as Monte-Carlo study that such an approach requires an impractically large sample size.

To overcome this limitation, I use the instrument-free methods proposed by [Byrne et al. \(2022\)](#) and [Imai et al. \(2024\)](#), which allow estimation of the demand and cost function by addressing the endogeneity of price using entrants' cost data. Building upon this foundation, I extend their framework to incorporate entry-exit decisions. My findings indicate that using both demand and cost data offers a more practical and effective estimation approach. I propose a data-augmented Markov Chain Monte Carlo (MCMC) estimation method and demonstrate through Monte Carlo simulations that this approach yields consistent estimates.

Furthermore, I apply the estimation techniques developed in this research to estimate the structural parameters of the Wisconsin nursing home market and discuss the social welfare implications of the Certificate of Need (CON) law. Counterfactual simulations reveal that abolishing the CON law would increase consumer and producer surplus by \$868 million and \$165 million, respectively, while government spending would rise by \$700 million. I also estimate important market structures, such as labor/capital elasticities, entry costs, and the difference in the distribution of service quality between entrants and non-entrants.

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## References

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