

**Background:** As policymakers face rising concerns over housing affordability, displacement, vacancies, new researchers need to get up-to-speed on methodological techniques to provide a data-driven foundation to design effective policy interventions. Though AI and emerging technologies can be used as helpful tools, overreliance without reviewing the literature can lead to major problems.

**Based on recent literature, what are strengths, limitations, and applications for methodological techniques to explore the relationship between homeownership and crime?**

- An in-depth review of literature was conducted using library and online databases JSTOR, Google Scholar, FSU Libraries on leading economics, housing, sociology, criminal justice, and methodological journals spanning the past thirty years to serve as a resource to help new policy researchers understand tradeoffs for different techniques and potential applications.
- Tradeoffs for four methodological techniques from the literature are highlighted below.

**Methodological Techniques**

**Two-Wave Cross Lag Model**

White (2001) : Home Ownership Crime and the Tipping and Trapping Processes

Purpose: To discover the reciprocal relationship between homeownership and crime

Results: Homeownership and crime show a reciprocal effect. Neighborhoods with higher initial homeownership rates saw decreases in crime rates over the next decade and vice versa

**Strengths**

- Estimates casual direction of the relationship
- Incorporation of time lags eliminates feedback loops between variables
- Helps control some forms of OVB by accounting for past influences in the model
- Accounts for stability of variables over time by measuring them at two time points

**Limitations**

- The model assumes that the relationship remains constant over time
- It is difficult to control for confounding variables
- With only two time points, the number of parameters are limited
- The model can not detect non-linear relationships

**Practical Applications**

- The two-wave cross-lagged model examines directionality and determines causal influence
- Tests if changes in a variable predicts changes in another, adjusting for initial levels
- Given fixed effects and causal evidence, policymakers can design more effective interventions

**Two-Stage Least Squares Regression**

Krieg (2020) : Neighborhood Revitalization - Exploring the Impact of Homeownership on Violent Crime

Purpose: To understand neighborhood effects by estimating the impact of owner occupancy rates on violent crime

Results: On average, an increase in owner occupancy rates will lead to a predicted 4.57% reduction in violent crime

- Mitigates reverse causality by isolating the exogenous variation in the main IV
- Addresses endogeneity from omitted variable bias or simultaneity issues
- Controls for unobserved confounders
- Enhances validity of analysis where direct experimentation is impractical

- The instrument must be relevant and uncorrelated with the error term
- Multiple instruments can cause overfitting
- 2SLS assumes that the errors are homoscedastic
- 2SLS is primarily designed for linear relationship

- The 2SLS model estimates causal relationships by addressing endogeneity and directionality
- Most researchers find homeownership affects crime indirectly via social cohesion or lending proximity
- Policymakers should enhance valid mediating factors to strengthen homeownership's impact on crime

**Difference-In-Differences Estimation**

Disney et al (2023) : Does Homeownership Reduce Crime? A Radical Housing Reform from the UK

Purpose: To examine the effect of the RTB Policy on crime rates

Results: From 1975 to 1985, 8.5% reduction in crime in the treatment group relative to the control. From 1975 to 1992, there was a 10.6% reduction in crime in the treatment group relative to the control

- Accounts for Pre-Existing Differences between the control and treatment groups
- The intent-to-treat strategy prevents selection bias
- Controls for time-invariant confounders by comparing changes over time
- DID can be extended to multiple groups with staggered treatment adoption

- The parallel trends assumption is difficult to test and unrealistic
- Selection bias with non-random assignment
- Treatment effects may vary across subgroups
- Contamination between treatment and control group
- Time of intervention implementation

- DID estimates a policy's causal effect
- It divides the sample into treatment and control groups, assuming parallel trends
- Comparing outcomes before and after the intervention isolates the policy effect
- Since Interventions are not always random, policymakers can use DID to control time-invariant confounders

**Cross-Sectional Multivariate Linear Regression**

Ni & Decker (2009) The Impact of Homeownership on Criminal Activity: Empirical Evidence from United States' County Level Data

Purpose: To examine the external effect of homeownership on crime, known as neighborhood effects

Results: An increase in the log of homeownership residual leads to a significant decline in property and violent crime in both 1991–1992 and 2001–2002

- Addresses reserve causality to provide a clear direction of relationship
- Mitigates endogeneity from simultaneity issues where variables may influence one another
- Minimizes short term fluctuations, to reveal stable long-term relationships
- Enhances robustness of causal inference

- It is difficult to establish causality over mere correlation
- The residual errors from the model might exhibit autocorrelation
- Selecting the optimal lag length is crucial
- Time-lagged models require that the data be stationary

- A time-lagged approach addresses reverse causality and determines causal influence
- Homeownership gradually shapes communities, so lagging the variable is crucial to capture these trends
- Policymakers should adopt this approach to justify interventions across different time periods and lag durations

**Policy Implications**

**Methodological Techniques**

- This methodological literature guides serves as a resource for new researchers by outlining the strengths, limitations, and applications of key quantitative techniques used to analyze the relationship between housing and crime.
- Literature from different studies consistently show that higher homeownership rates are associated with lower property and violent crime rates, while methodological approaches aim to isolate causal influence between homeownership and crime across varying geographic scales.

**Emerging Technology**

- Despite AI's potential to make research more accessible, AI may struggle when historical data is unavailable or incomplete, requiring researchers to gather the necessary information.
- AI also selects confounding variables to control based on statistical methods, which may overlook factors that are more relevant according to economic theory or contextual understanding.

**Human Skills and Technology**

- As AI continues to evolve, adopting a transparent and cautious approach to its integration with traditional econometric techniques may create a more adaptive and reliable tool for public policy.

**Moving Forward**

- By conducting preliminary research and gaining a strong understanding of these methodologies, policy researchers can leverage AI to uncover complex patterns, minimize biases, and develop more effective housing and crime policies that foster safer communities.

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