Looking Back To Move Forward in Homeownership Research

Sandra J. Newman
C. Scott Holupka
Johns Hopkins University

For those interested in the effects of homeownership on children's well-being, the empirical litera-ture offers good news and bad news. The good news is that the topic has generated a sizable body of serious research by highly respected researchers. The existence of multiple studies examining the same basic question is the coin of the realm in the hard sciences but is all too rare in housing policy research. The bad news is that this research has not produced consistent evidence about whether the effects of homeownership are positive, negative, or nonexistent. Because the studies are not replications, differences in a host of features from sample composition to the approach for addressing selectivity bias could account for discrepant results. Until we begin to take stock of the state of homeownership research and the tedious task of sorting through the sources of these diver-gent results, we are unlikely to make much progress in understanding whether a "homeownership effect" exists. In this commentary, we start this stocktaking and sorting process. We briefly discuss four topics: addressing selection; specifying models; treating income, race, and ethnicity; and handling residential stability.

Selectivity Bias

Researchers agree that a (or perhaps *the*) major challenge in estimating the net effects of home-ownership on child well-being is separating the effects of the characteristics of parents who select into homeownership, which are highly correlated with child outcomes, from the effects of the homeownership per se. Most studies of homeownership address selection with an instrumental variable (IV) strategy.

Exhibit 1 summarizes key characteristics of 10 prominent studies of homeownership, nearly all of which use nationally representative panel data. The first column indicates that 9 studies use an IV, and 1 study (Engelhardt et al., 2010) uses an experimental design. The first 7 studies pertain to shorter term child outcomes or the effects of homeownership during childhood and adolescence on longer term outcomes in early adulthood. We include the final 3 studies, which pertain to ef-fects on citizen engagement, because the selection problem applies to all homeownership outcomes (not only child outcomes), all IV studies must estimate a first-stage model predicting homeowner-ship regardless of the outcome being predicted in the second-stage model, and this group of studies includes the only experimental evidence available.

Exhibit 1

Key Features of Selected Research on Homeownership Effects (1 of 7)

I. Child Well-Being

Exogenous IV	Strength[a]	Independent Variables	Outcomes	Sample/Data	Finding(s)
Ratio of average user cost of HO to average renter cost in year of household's most recent move.[b] Source: Green and White (1997).	Renter: B = – 14.2, SE (2.0), p < .001. Owner: B = – 14.4, SE (2.0), p < .001.	Owned home.[c] Head's race. Family size. Family income. Head younger than 18 when child born. Head's education. Head female. Head divorced. Head worked in past year.	Still in school. Had a child (girls only).	PSID, national; 1980 through 1987, out-comes and covariates measured in year when child is 17 years old.	Probit models for all three datasets find that HO has statistically significant effects on— • Still in school (+). • Have a child (-). No statistically significant evidence of selection bias found.
Average HO rates by state, by year, by race, and by income quintile. Number of family moves before child turned 5 years old (IV for residential mobility). Source: Aaronson (2000).	*F*-statistic, full sample: 216.1 (w/o mobility) 126.5 (with mobility). Partial R²: 0.053 (w/o mobility) 0.060 (with mobility).	Child's race. Child's gender. Whether in stepfamily. Parents' education. Family income. Head worked in last year. Family composition. Number of children. Year dummies. Frequency of moves. Duration of residence. House equity. House equity.[b] Vehicle equity. Vehicle assets.[b] Other real estate. Other real estate.[b] Cash, stocks, bonds.	Graduated from high school by age 19.	PSID, national; 1975 through 1993: out-comes measured in year when child is 17 years old. Time varying covariates measured from ages 7 to 16.	Statistically significant (+) effect in base model. Not statistically significant when mobility added to model.

Exhibit 1

Key Features of Selected Research on Homeownership Effects (2 of 7)

Exogenous IV	Strength[a]	Independent Variables	Outcomes	Sample/Data	Finding(s)
Index of house prices. Source: Haurin, Parcel, and Haurin (2002).	$B = -0.73$, $t = 3.4$, $p < .001$. Model correctly predicts 87% of renters, 68% of owners.	Whether homeowner. Duration owned home. Parents' wages. Nonlabor income. House value. Other real estate value. Owned businesses value. Value of vehicles. Value of other durables. Financial assets. Family size. Maternal marital history. Maternal background.[d] Paternal background (age, education). Child characteristics.[e] Community characteristics.[f]	HOME-C. HOME-E. PIAT-Reading. PIAT-Math. BPI.	NLSY 97, national; children ages 5 to 8 in 1988, outcomes observed in 1988, 1990, 1992, and 1994.	IV models, statistically significant effects on— • HOME-C (+). • HOME-E (+). • PIAT-Math (+, p < .10). • PIAT-Reading (+, p < .10). Find statistically significant sample selection bias in four of six outcomes.

Exhibit 1

Key Features of Selected Research on Homeownership Effects (3 of 7)

Exogenous IV	Strength[a]	Independent Variables	Outcomes	Sample/Data	Finding(s)
Annual change in state's per capita highway investment. Ratio of renter-to-owner costs in census region year of last move. Metro/county ratio of median rent to median property value. State HO rate. Source: Harkness and Newman (2003).	Low-income sample: Highway stock (+), t = 2.8, p = .005. Cost ratio (+), t = 5.69, p = .000. Metro area (+), t = 4.95, p = .000. State HO (+), t = 11.82, p = .000. High-income sample: Highway stock (+), t = 1.76, p = .078. Cost ratio (+), t = 1.47, p = .141. Metro area (+), t = 7.17, p = .000. State HO (+), t = 6.59, p = .000.	Child in owned home ages 11 to 15. Race. Gender. Year born. Mother's age at birth. Head's education. Number of children. Years in two-parent family $\bar{x}$ annual earnings. Income beyond earnings. Years on welfare. Years in city > 500,000 population. Years in city 100,000 to 500,000 population. State.	Teen birth (girls only). Idleness age 20. Years education age 20. High school graduate by age 20. Postsecondary education. Average earnings. Received welfare.	PSID, national; children born 1957 through 1973 with PSID data available when ages 11 to 15. Two income samples: low income (< 150 poverty) and high income (>150 poverty). Chow tests results reject pooling low- and high-income households.	Statistically significant results by IV— Low-income sample: • None with state HO. • Highway stock, cost ratio, and metro area: • Years of education (+). • High school grad (+). • Postsecondary (+). • Earnings (+). • Welfare (-). High-income sample: None with any IV.

Exhibit 1

Key Features of Selected Research on Homeownership Effects (4 of 7)

Exogenous IV	Strength[a]	Independent Variables	Outcomes	Sample/Data	Finding(s)
Index of metro HO prices.	Strength of individual IVs not reported.	Percent years in owned home.	High school diploma or more.	PSID, national; children born between 1968 and 1974, outcomes observed 1999.	Only HO in 1999 (+) statistically significant.
Index of metro gross rents.	Overall model "only performed moderately well (the R^2 was 0.29), although we had 12,500 child-year observations and only 31 regressors."	$\bar{x}$ tract poverty.	College degree or more.		Recommend treating IV results "as suggestive only." Note that parameter estimates in IV models are as large, or larger than OLS models, but SEs are larger, producing nonsignificant results.
30-year fixed mortgage rate.		Percent childhood years moved.	No child before 18.		
Ratio metro rent/own costs.		Race.	HO in 1999.		
Received lump sum payment.		Gender.	Ln wages.		
Change in household income.		Birth order.			
HO rate in county.	"...The relatively weak power of the instruments leaves us with little variation to exploit."	Age.			
Interaction terms by renter status.		Married.			
Source: Galster et al. (2007).		Hours worked.			
		Parents' and household characteristics.[g]			
State average marginal tax rates, 1- and 5-year averages.	Dropout by age 17: 5-year, B = – 0.001, not significant. 1-year, B = – 0.002, not significant.	Whether homeowner.	Dropout by age 17.	PSID, national; 1980–2007, outcomes and covariates measured in year when child is 17 years old.	Statistically significant (-) for both outcomes using either IV.
Source: Green, Painter and White (2012).	Mother by 17: 5-year, B = 0.001, not significant. 1-year, B = 0.001, not significant.	Length of tenure.	Had a child (girls only).		
		Parents' educational attainment.			
		Parents' employment status.			
		Household size.			
		Parents' marital status.			
		Family's income.			
		Financial wealth.			
		Race.			
		Mother's age when first child born.			
		Location and year fixed effects.			
		Size of downpayment.			

Exhibit 1

Key Features of Selected Research on Homeownership Effects (5 of 7)

Exogenous IV	Strength[a]	Independent Variables	Outcomes	Sample/Data	Finding(s)
Housing price index (FMR).	F-Statistic:	Percent childhood owned home.	PSID: WJ letter word.	2002 PSID-CDS, national; all Black/White children, ages 5–17 in 2002.	No statistically significant HO effects.
Average HO rates by race and income quintiles by state.	PSID FMR Black: 0.87–3.09. White: 0.95–3.42.	Child's age. Mother's age. Mother's education.	WJ passage comp. WJ applied problems.	NLSY79 child surveys, national; children born after 1985.	Similar results (only a few statistically significant HO effects) found when using propensity matching.
Source: Holupka and Newman (2012).	HO Rate Black: 6.96–8.36. White: 2.08–4.56.	Mother's cognitive ability. Percent years in two-parent family.	BPI. Health.		
	NLSY FMR Black: 1.39–1.86. White: 0.00–0.48. Hispanic: 3.35–6.77.	Never in two-parent family x̄ number of siblings. Percent childhood on welfare. Whether always on welfare. Average family income over child's life.	NLSY: PIAT reading recog. PIAT reading comp. PIAT math.		
	HO Rate Black: 4.42–6.81. White: 7.52–8.85.	Whether breastfed. Whether metro area. Number of years since first HO. Parental mediators.[h] Cognitively stimulating materials in home. Residential stability. Neighborhood mediators.[i]	BPI.		

Exhibit 1

Key Features of Selected Research on Homeownership Effects (6 of 7)

Exogenous IV	Strength[a]	Independent Variables	Outcomes	Sample/Data	Finding(s)
II. Citizen Engagement					
Average homeownership rate by income quartile, by state, by race. Source: DiPasquale and Glaeser (1999).	Not reported. Authors note that "in several cases instrumenting causes the coefficient to rise to implausibly high levels," which they attribute to the use of imperfect instruments.	Owned home. Age. Race. Gender. Marital status. Children in household. Log city size. Educational attainment. Income. Length of residence. Structure type.	Number of non-profit organization members. Know school head. Know congressman. Vote local election. Help local problems. Garden. Own a gun. Attend church.	U.S. General Social Survey.	IV models: (+) effect on all outcomes. Statistically significant on majority.
Random assignment. Source: Engelhardt et al. (2010).	B = 0.092, SE (0.046), p < .05.	Whether homeowner.[j] Marital status. Income. Number of children. Race.	Voted in an election. Support local candidate. Contact public official. Volunteered. Worked neighborhood project. Participate in community organization. Cared for adult/child. Watched a home/pet. Contact for someone. Exterior home repairs. Interior home repairs.	Tulsa IDA experiment; employed; income < 150% FPL.	No statistically significant HO effects.

Exhibit 1

Key Features of Selected Research on Homeownership Effects (7 of 7)

Exogenous IV	Strength[a]	Independent Variables	Outcomes	Sample/Data	Finding(s)
State-specific total maximum mortgage subsidy rate. Source: Hilber (2010).	*F*-statistic Ranges from 1.8 to 2.8 across 12 models (4 outcomes, 3 model specifications).	Whether homeowner. Number of years in same community. Plan to stay 5+ years. Commuting time. Race. Gender. Age. Whether a parent. Income. Marital status. Educational attainment. Employment status. Percent developed land in tract. Neighborhood characteristics.[k] Murder arrest rate.	Number of social interactions (log). Participate in neighborhood groups. Number of social interactions with coworkers. Participate in fraternal and service organizations.	Social Capital Community Benchmark Survey (2000), 41 communities throughout the United States.	HO statistically significant (–) with number of social interactions. HO by percent land developed (focal variable), statistically significant (+) for number of social interactions and in neighborhood groups. IV estimates computed using JIVE instead of 2SLS, produced similar results.

BPI = Behavioral Problems Index. FMR = Fair Market Rent. FPL = federal poverty line. HO = homeownership. IV = instrumental variable. Ln = natural log. NLSY = National Longitudinal Surveys of Youth. OLS = ordinary least squares. PIAT = Peabody Individual Achievement Test. PSID = Panel Study of Income Dynamics. PSID-CDS = PSID-Child Development Supplement. SE = standard error. w/o = without. WJ = Woodcock-Johnson. x̄ = mean.

[a] IV strength measured by whether IV is statistically significant in the first stage model, or reported F-statistic of 10 or greater.

[b] IV variable used to account for selection in a bivariate probit (endogenous switching) model, not a regular IV.

[c] Variables listed for PSID. Public Use Microdata Sample analysis adds length of tenure and housing cost. High School and Beyond analysis adds dummy income variables, youth disabled, English spoken at home, whether youth attends an academic high school, and whether the school is urban or rural.

[d] Ethnicity, age, education, cognitive ability, religiosity, household type where mother resided at age 14, maternal mastery, and paid work hours during child's first 3 years of life.

[e] Gender, whether disabled, and low birth weight.

[f] Median household income, population density, percent Black, percent Hispanic, unemployment, poverty, crime, and education.

[g] During childhood years: percent of years in poverty, percent of years in two-parent family, percent of years living in metro area, average number of neighbors head knows by name, percent of years with family within walking distance, education of head, occupational prestige of head, percent of years head self-employed, percent of years wife of head employed, annual hours head worked, religion of head, percent of years head read a newspaper every day, percent of years head belonged to a union, percent of years head did not attend weekly religious service, percent of years head never participated in social clubs, percent of years head planned life ahead, percent of years head trusted most people, whether head is a veteran, mother first gave birth as teen, and head raised in large city or small town.

[h] Parental warmth toward child, parent activities with child, and parent stress.

[i] Poverty rate, homeownership rate, and residential stability.

[j] Four years after randomization.

[k] Homeownership rate, percent of housing units in that are in multiunit buildings, size of the settlement to which the neighborhood belongs, average household income, income Gini coefficient, measures of linguistic heterogeneity, measures of ethnic heterogeneity, and population size and density.

We draw three main conclusions from reviewing the first column listing the IVs and the second column showing the strength of the IVs. First, the range of IVs tested to date and their weak performance indicate that we have not been successful in identifying theoretically valid and empirically strong instruments.[1] This set of results may indicate that we need to think harder, but it may also indicate that we need to consider other strategies for addressing selection beyond the IV approach.

Second, while there is some overlap in IVs, only one identical replication exists: Holupka and Newman (2012) intentionally replicate Aaronson (2000) to allow for the comparison of results from the second-stage outcome models. Comparing results when the IV is different (or even when it is similar but not identical) could account for differences in both IV strength and outcome findings. For example, studies by Green and White (1997) and Galster et al. (2007) both use the ratio of the cost of owning to renting, measured in somewhat different ways, as their IV; both analyze national Panel Study of Income Dynamics (PSID) data for all income groups combined; and both examine education and teen birth outcomes in late adolescence. Yet Green and White report that their IV has no effect on their probit models showing effects of homeownership on both outcomes, and they conclude that no evidence of selectivity bias exists. By contrast, Galster et al. use the ratio of owning to renting as one of several IVs, report that their first-stage homeownership prediction model performed "only moderately well," and find no effects of homeownership on these two sets of outcomes. Another example of inconsistent results arises in analyses using variants on the state homeownership rate, a second IV that has been used in several studies. Focusing only on studies that consider all income groups combined, this IV is relatively weak in DiPasquale and Glaeser (1999)[2] and Galster et al. (2007) but is very strong in Aaronson (2000).[3]

Finally, although the IV approach has yielded mixed results to date, two other analytic approaches are consistent with the IV approach in not finding a homeownership effect. The strongest evidence comes from the sole homeownership experiment (Engelhardt et al., 2010), and additional evidence comes from propensity score matching (Holupka and Newman, 2012). In both cases, after selection is accounted for, homeownership has no effect on community engagement (Engelhardt et al., 2010) or on child cognitive achievement, behavior, or health (Holupka and Newman, 2012).

Model Specification

The third column of the exhibit lists the covariates included in the models. Although substantial overlap exists in demographic and socioeconomic background variables, substantial differences also exist across studies, which could account for discrepant results. Noteworthy for this brief commentary are the treatment of assets and wealth, neighborhood characteristics, and community characteristics. Key issues are whether controls for any of these indicators should be included,

---

[1] Some of the IVs used to date do not appear to meet the exclusion principle. For example, state homeownership rates could plausibly affect children's cognitive achievement through their effect on property taxes, which are the main source of revenue for public schools.

[2] DiPasquale and Glaeser rely on their uninstrumented ordinary least squares model because they describe the homeownership coefficient in the outcome model with the instrument as "implausibly large."

[3] Although Aaronson reports large F-test results, the partial R^2 for each model is small.

given endogeneity concerns, how they should be accounted for, and, if included, which measures should be used. Another issue is the inclusion of mediator variables in reduced form models, which will lessen the estimated effect of homeownership.

Treatment of Income, Race, and Ethnicity

Most homeownership research includes income, race, and ethnicity among the array of independent variables in the first-stage homeownership prediction model and the second-stage outcome models. This approach assumes that the effects of all other covariates on the outcomes are the same for higher and lower income households and households in different racial and ethnic groups. Yet, Chow tests confirm the substantial heterogeneity by income, race, and ethnicity and indicate that subgroups by income, by race, and by ethnicity should not be pooled.[4] Pooling heterogeneous income, race, and ethnic groups into a single sample is problematic in any regression analysis but more so in IV models, because the first-stage model assumes linear effects (Murray, 2006; Terza et al., 2008).

Addressing Residential Stability

On average, homeowners are more residentially stable than renters. Because child development and educational research suggests that residential stability is beneficial for developmental and academic outcomes, the role of homeownership in fostering stability has broad policy significance. The analytic challenge is, again, a selection issue: disentangling the possible selection of stable households into homeownership from the effects of homeownership itself. Including a measure of residential stability as a righthand-side covariate in outcome models (for example, DiPasquale and Glaeser, 1999; Green et al., 2012) does not address the selection issue. Aaronson (2000) tests an IV measuring the family's mobility before the child turned 5 along with a righthand-side control for mobility at older ages. Using this approach results in statistically insignificant effects of home-ownership on remaining in school until age 17. This finding suggests that after residential stability is properly accounted for, the effects of homeownership disappear. The interpretation of this finding is that it is stability, not homeownership, that plays an important role. Holupka and Newman (2012) test the role of stability as mediating the effects of homeownership on child outcomes. Although they find that homeownership has a significant positive effect on residential stability, no evidence confirms that the role of homeownership on outcomes is mediated by stability.

Discussion

The invitation from *Cityscape* to write this commentary forced us to take a colder and harder look at the body of research on the effects of homeownership on children than we have before. Existing research has produced contradictory results. This research relies on the IV method to address selection; typically pools all income, race, and ethnic groups in a single analysis; and varies in its approach to covariate controls, including those that are arguably endogenous. If future research continues on

---

[4] Results are available from authors on request.

this same path, there is no reason to expect different results or, importantly, clearer insights into homeownership effects. Instead of doing more of the same, we advocate digging into the existing body of homeownership research to develop a clearer understanding of the sources of these differences. This approach should enable us to interpret existing results and to establish a stronger foundation for future research. More direct replications could also be illuminating (Satel, 2013).

Based on our admittedly cursory review, it seems clear that identifying even a single IV that meets the theoretical criteria and empirical standards of a strong instrument has proved elusive. Therefore, it is time to consider other methods that also support causal inference. Noteworthy in this regard are the two studies that use two other methods—an experiment (Engelhardt et al., 2010) and propensity score matching (Holupka and Newman, 2012). Both of these studies report no effects of homeownership on outcomes. Beyond the selection issue, we also recommend that the next generation of homeownership research recognize and address the heterogeneity of income, race, and ethnic groups and the confounding of homeownership and residential stability.

Authors

Sandra J. Newman is a professor of policy studies in the graduate program in public policy and Director of the Center on Housing, Neighborhoods, and Communities at the Institute for Policy Studies at Johns Hopkins University.

C. Scott Holupka is a senior research associate in the Center on Housing, Neighborhoods, and Communities at the Institute for Policy Studies at Johns Hopkins University.

References

Aaronson, Daniel. 2000. "A Note on the Benefits of Homeownership," *Journal of Urban Economics* 47: 356–369.

DiPasquale, Denise, and Edward Glaeser. 1999. "Incentives and Social Capital: Are Homeowners Better Citizens?" *Journal of Urban Economics* 45: 345–384.

Engelhardt, Gary, Michael Eriksen, William Gale, and Gregory Mills. 2010. "What Are the Social Benefits of Homeownership? Experimental Evidence for Low-Income Households," *Journal of Urban Economics* 67: 249–258.

Galster, George, Dave Marcotte, Marvin Mandell, Hal Wolman, and Nancy Augustine. 2007. "The Impact of Parental Homeownership on Children's Outcomes During Early Adulthood," *Housing Policy Debate* 18 (4): 785–827.

Green, Richard K., Gary D. Painter, and Michelle J. White. 2012. *Measuring the Benefits of Homeowning: Effects on Children Redux.* Research Institute for Housing America Special Report. Washington, DC: Mortgage Bankers Association.

Green, Richard, and Michelle White. 1997. "Measuring the Benefits of Homeowning: Effects on Children," *Journal of Urban Economics* 41: 441–461.

Harkness, Joseph, and Sandra Newman. 2003. "Differential Effects of Homeownership on Children From Higher- and Lower-Income Families," *Journal of Housing Research* 14 (1): 1–19.

Haurin, Donald, Toby Parcel, and R. Jean Haurin. 2002. "Does Homeownership Affect Child Outcomes?" *Real Estate Economics* 30 (4): 635–666.

Hilber, Christian. 2010. "New Housing Supply and the Dilution of Social Capital," *Journal of Urban Economics* 67: 419–437.

Holupka, Scott, and Sandra Newman. 2012. "The Effects of Homeownership on Children's Outcomes: Real Effects or Self-Selection?" *Real Estate Economics* 40 (3): 566–602.

Murray, Michael. 2006. "Avoiding Invalid Instruments and Coping With Weak Instruments," *Journal of Economic Perspectives* 20 (4): 111–132.

Satel, Sally. 2013. "Primed for Controversy," *New York Times*, February 24.

Terza, Joseph, Anirban Basu, and Paul Rathouz. 2008. "Two-Stage Residual Inclusion Estimation: Addressing Endogeneity in Health Econometric Modeling," *Journal of Health Economics* 27: 531–543.