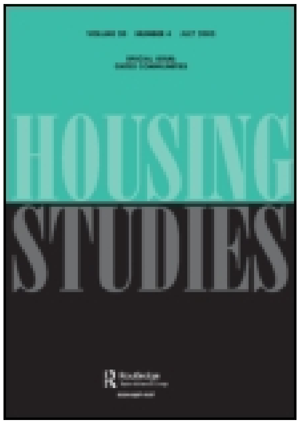

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ABSTRACT *Using longitudinal data from the Panel Study of Income Dynamics (PSID) between 1984 and 2001 among only renter households in 1984, this paper looks at the relationship between length of homeownership thereafter during that period and household income in 2001. The study found that the longer the period of homeownership during the studied period, the higher future household income was by 2001. It is estimated that each year of ownership is associated with approximately 2 per cent of increase in household income and doubling the length of ownership increases household income by about 11 per cent.*

KEY WORDS: Homeownership, benefit, income

Introduction

The ideal of homeownership is such an intrinsic part of the American Dream that its value for individuals, families, communities and society is rarely questioned. There has always been bipartisan support for Federal policies designed to encourage homeownership. In the academic world, there is also a rich body of research on the benefits and costs of homeownership, but the consensus is less strong. For good summaries of this literature, see Coulson (2002); Megbolugbe & Linneman (1993); McCarthy *et al.* (2001); Rohe *et al.* (2002).Most claims about the benefits of homeownership fall into three categories: personal well-being, social benefits and economic growth. Unusually, personal well-being appears to be the weakest voice in the chorus praising the benefits of homeownership, and there is a particular lack of empirical evidence to show that homeowners achieve higher levels of future household income compared to similar renters, everything else being equal in their background. In the promotion of homeownership, evidence could show this as a benefit. This paper provides such evidence.

Some argue that homeownership is damaging to individual labor market outcomes because its relative immobility prevents owners from pursuing job opportunities (Oswald, 1996, 1997, 1999), although such a hypothesis was not supported by a later study

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(Coulson & Fisher, 2002). Instead, that study found that "home owners, *conditionally* or *unconditionally*, have better labor market outcomes than renters" (p. 35). In a recent study by Haurin & Rosenthal (2005), it was found that household earnings among new homeowners (in a sample of young and middle-age people) typically rise at a relatively rapid rate, but the authors added a cautionary note about causality, namely, the causality probably flows in both ways: families with expected income growth are more likely to decide to buy homes, and homeownership may also cause households to increase their work effort and income.

In fact, this kind of caution often appears in studies on the benefits of homeownership. Unlike studies on determinants of homeownership, where the causal structure for modeling tenure choice is usually very clear, research on the benefits of homeownership often includes a cautionary note, as in Haurin & Rosenthal (2005). Some researchers state that "there are mechanisms that suggest that this could be a causal relationship" (Aaronson, 1998, p. 2) while others suggest their findings 'indicate causal effects' (Harkness & Newman, 2003, p. 1).

A causal relationship between homeownership and future household income is possible with the existence of several mechanisms. The most direct one is cash-out refinance. A homeowner with enough home equity appreciation over the past year or recent years could reap good benefits from housing wealth. Capital gains from home sales could also be used as an endowment and their investment returns could generate additional income. Life cycle consumption theory suggests that some homeowners would take reverse mortgages to increase their incomes after retirement. There is also evidence that homeowners put in more work effort in order to afford mortgage loans (Haurin & Rosenthal, 2005) and that households increase their labor effort even prior to becoming homeowners (Haurin *et al.*, 1996). Some even suggest that owning a home has important effects on homeowner psychology and the ways a homeowner thinks about spending, saving and the future, arguing that "while incomes feed people's stomachs, assets change their heads" (Sherraden, 1991, p. 6). Others use the 'theory of reasoned action' and the 'theory of planned behavior' as frameworks for considering the impact of homeownership (Hubbard & Davis, 2002).

This paper uses a longitudinal data sample from the Panel Study of Income Dynamics between 1984 and 2001, tracing all households that were in the sample from 1984–2001 and who were renters in 1984. With their initial housing tenure as renters, these households may or may not have had a history of homeownership prior to 1984, but they did not own homes in 1984, and their pre-1984 tenure history can be assumed as random and without a particular pattern.

Such panel data made it possible to look at household income in 2001 in relation to the number of years of owning a home post-1984, after controlling for initial household income level in 1984 and other possibly relevant variables. Rather than use a sample of young and middle-age householders, as did Haurin & Rosenthal (2005), this study included householders of all ages. The study looked at future household income levels instead of earnings growth rates, which was slightly different from the study by Haurin & Rosenthal (2005). It was found that the length of homeownership during the period 1985–2001 was positively associated with higher household incomes in 2001, after controlling for the initial level of income and wealth in 1984, as well as other factors such as age, race, initial education level in 1984, family type change, education level increase, times of moving, and whether both household head and spouse worked in 2001.

As in any panel data, there is a panel attrition impact; however, such an impact, may not necessarily affect responses on concerned subject matter. In a study by Dennis (2003), he concludes that, by the measures he has examined, panel attrition did not have a substantial impact on the survey responses. In particular, in a study by Lillard & Panis (1998) on panel attrition from the PSID (the data used in the current study), they concluded that, despite evidence of significant selectivity in attrition behavior, the biases introduced by ignoring selective attrition are very mild. Indeed, it is a fact that in the PSID data those less educated, blacks and renters are more likely to be out of the sample over time (Lillard & Panis, 1998). If they were included in the sample, the observed difference or gap in household income between owners and renters might be larger because they would be less likely to have become high-income owners during the studied period.

The discovery of a positive association between homeownership and future household income in this paper suggests a benefit of homeownership that has been little discussed before. It not only strengthens the literature on the benefits of homeownership, but could also be used for a more effective promotion of homeownership. Many would want to become homeowners after hearing that their future household incomes are likely to be higher than that of those who choose to remain renters. This empirical evidence on the benefit of homeownership would also be useful to policy makers.

Literature Review

This section briefly reviews previous studies conducted prior to Haurin & Rosenthal (2005) concerning the benefits of homeownership in the three categories mentioned above, namely, personal well-being, social benefits and economic growth. The last one seems to be the least disputable. The greatest macro-economic benefit of homeownership is seen in the millions of jobs it creates for American workers (HUD, 1995). The importance of housing to the economy is well documented (JCHS, 2003, 2004, 2005, etc; MHC, 2002), and recently there have been several studies on the 'wealth effects' of housing on consumer spending (Belsky & Prakken, 2004).

The social benefits of homeownership are also well studied but not necessarily conclusive. The argument often includes neighborhood stability and crime prevention (Cisneros, 1995; Rohe & Stewart, 1996), social involvement and political activism (Ahlbrandt & Cunningham, 1979; Baum & Kingston, 1984; Cox, 1982; DiPasquale & Glaeser, 1999; Guest & Oropesa, 1986; Kingston & Fries, 1994; Lyons & Lowery, 1989; Rohe & Stegman, 1994; Rossi & Weber, 1996), and socially desirable youth behaviors, such as better education attainment and outcome for children of homeowners (Aaronson, 1998; Boehm & Schlottman, 2002; Essen *et al.*, 1978; Green & White, 1997; Haurin *et al.*, 2002). Some have also criticized the US for creating a housing finance system that makes the direct benefits of owning a home most favorable for high-income families and least favorable for low-income families (McCarthy *et al.*, 2001) and in which the largest subsidies in housing go to those with the highest income (Coulson, 2002).

Wealth accumulation is an important part of the research on how homeownership benefits personal well-being. Several studies have simulated the returns from owning relative to renting under various assumptions about how homes are financed and how renters might have invested funds they would otherwise have used for a downpayment (Belsky & Duda, 2002; Goetzmann & Spiegel, 2002; Goodman, 1997; Ibbotson & Siegel, 1984). Boehm & Schlottman (2002) found that, all other factors being equal, the children of homeowners tend to achieve higher levels of education and income, own homes sooner, and accumulate more housing and non-housing wealth than the children of renters.

Using the Panel Survey and Income Dynamics (PSID), a study by Di *et al.* (2003) tracked a sample of households over the period of 1984–99 and found that homeowners accumulated much more wealth than renters over this period, after controlling for age, race/ethnicity, marital status and initial wealth and household income levels in 1984. In addition to the investment returns of homeownership, what is important is that homeowners could borrow against home equity to 'cultivate' new ways to build wealth (Di, 2001). By tapping home equity to start a business, invest in stocks or spend their money on their own (or their children's) education, homeowners have the potential to increase both income growth and future wealth accumulation.

Other studies provide some empirical evidence on the psychological benefits of homeownership, such as higher self-esteem (Balfour & Smith, 1996; Clark, 1997; Rohe & Stegman, 1994), better control over life and environment (Balfour & Smith, 1996; Galster, 1987; Saunders, 1990; Smith, 1970), and more life satisfaction (FannieMae, 1992; Rossi & Weber, 1996; Tremblay & Dillman, 1983). But this evidence is inconclusive and sometimes there is even opposing evidence (Doling & Stafford, 1989; Hoffmann & Heistler, 1988; Lauria, 1976; Rohe & Basolo, 1997). There is more conclusive evidence on the narrowly defined satisfaction with housing units and neighborhoods (Danes & Morris, 1986; Kinsey & Lane, 1983; Lam, 1985; Lane & Kinsey, 1980; Morris & Winter, 1976; Varady, 1983). As some researchers state, additional research on the impacts of homeownership on self-esteem and perceived control is clearly needed (Rohe *et al.*, 2002).

Although income has often been used as a predictor for homeownership outcomes (Megbolugbe & Linneman, 1993), income has rarely been examined as an outcome of homeownership. The theory about social capital has only suggested the importance of social networks associated with homeownership or the locations of homes to individual labor market outcomes and psychological well-being (Briggs, 1998; Lang & Hornburg, 1998). No previous study has examined future household income level as an outcome of the household's housing tenure choice and its duration throughout a long study period of over 15 years. If future household income is a benefit of homeownership, such a benefit may overshadow many other benefits of homeownership and can be used to promote homeownership much more effectively.

Data and Methodology

The PSID data were collected by a longitudinal survey of a representative sample of individuals and their families. Data were collected annually from 1968 to 1997 and biennially thereafter. The sample size grew from about 4800 families in 1968 to more than 7000 families by 2001. Originally the PSID had both a cross-section national sample and a sample of low-income people, but most of the over sampled low-income cases were dropped in 1997 and replaced by more immigrants.

A total of 709 households who were renter households in 1984 were consistently in the data for all survey years between 1984 and 2001. Due to missing data on the key information on housing tenure in some of the years during the period, 67 cases were dropped and only 642 cases remained in the models. The dependent variable in the models was always household income in 2001, and the main independent variable was the length of homeownership between 1985 and 2001.

The study controlled for many factors that might influence household income in 2001. Household income in 1984 was controlled for as a benchmark of the initial household income. Education level in 1984 was also controlled for, because the 1984 current income may have been temporary and unstable, while education level was a proxy of earning capacity. There was also control for household net wealth in 1984, because the initial wealth level or the economic power of the household may have had some influence on the outcome of its future household income.

Given the highly skewed distribution of income and wealth and the non-linear relationship between income and wealth, logarithmic transformations were performed on both the dependent and independent variables on income and wealth. Before the log transformation, a value of $1 was assigned to cases with zero or negative household income and wealth to prevent the automatic loss of cases in logarithmic transformations.

Some demographic and geographic characteristics were also controlled for. The age of the household head in 1984 was a controlled variable. Racial/ethnic background of the household head was coded as 'white' or 'minority' without further breakdown because the number of Hispanics, Asians and other groups was too small to analyze separately. Family type change can influence household income as it may change the number of earners in the household. Married couples may have higher household income for possibly having two earners. Marital status in 1984 and 2001 was coded as single male-headed, single female-headed or married couple households and dummy variables were then created to represent changes over time, such as married in both 1984 and 2001 or changed from single male-headed to married couples.

Geographic variables such as region and type of location (large metropolitan area, other metro, small city or rural area) were also controlled for because of the variations in household income across geographic boundaries. Large metro areas, for example, were expected to have higher household income levels.

The impact of moving on income growth is not clear and it is debatable. Stability may have a positive influence on productivity, particularly among renters, but less mobility may also constrain the opportunity to take a better job elsewhere, as some in the literature have argued. Therefore, in addition to the length of homeownership, a control variable was added to present the frequency of moving during the period.

To the extent that homeownership may have a 'cultivating' effect, e.g. using home equity to help owners fund education that may improve future earnings, a dummy variable was added to mark the increase in the education level of the household head. To the extent that homeowners may put in more labor effort in order to remain in homeownership, there was an attempt to control for it by creating a dummy variable on whether both spouses worked in 2001.

The general equation for the models can be written as:

$$\text{Log } I = \alpha + \beta h * H + \beta c * C + \varepsilon,$$

where I is household income in 2001, α is the intercept, ßh is the coefficient for years of homeownership (H), ßc is a vector of coefficients for the covariates (C), and ε is the residual. The effect of homeownership is tested by considering whether ßh is statistically different from zero.

To make the data appear more normally distributed and easier to interpret, log transformations were also applied to other continuous independent variables. They were: owning years, moving times and household head age in 1984. Since zero is a legitimate value in the first two of these variables, one was added to all the values in these two variables before log transformations were carried out so that those with zero would not be dropped automatically from the models. In the last model, original values of these continuous independent variables without log transformations were used to estimate the impact of these variables by each unit change instead of percentage change. It also reinforced the previous models by showing that findings from those models did not depend on log transformation of the key independent variable, which made the findings more robust.

Table 1 lists all of the variables used in the models and gives basic statistics on the unweighted sample.

Regression Model Results

As Table 2 shows, the length of homeownership is positively associated with household income in 2001, after controlling for initial household income and net wealth in 1984, family type change over time, the age, race and the education level of household head in 1984 as well as geographic location in 2001. Model 1 was the initial model and controlled for the above characteristics. Model 2 further controlled for whether the household head improved their education level during the studied period, and Model 3 further controlled for whether both spouses were working in 2001.

Model 1 indicated that a 1 per cent increase in the average number of years of owning a home during the entire period resulted in a 0.126 per cent increase in the average household income in 2001. As the average owning period among the sample group was approximately eight years and the average household income in 2001 was about \$70 000, those who were owners for 16 years would probably have had an approximate household income in 2001 of nearly \$80 000, everything else in the household characteristics controlled for in the model being equal. On the other hand, a household owning a home for only about four years during the period expected to have a household income of just over \$60 000 in 2001, all other household characteristics being equal.

As expected, the initial level of household income in 1984 definitely influenced the levels of income in 2001. Those who started with low incomes were not expected to catch up with those starting with high incomes. Even after controlling for the household income in 1984, the impact of education level in 1984 was still significant, indicating that those with the same income in 1984 and a better education would have a higher income than those less educated by 2001.

Wealth levels in 1984 turned out to be not significant. Minority status was also not significant. Compared to being a married couple in both 1984 and 2001, all other types of family change, except for changing from a single male-headed household to a married couple household, resulted in a lower household income in 2001.

Although income usually peaks at the age of 45–54, those who achieved a similar income at a younger age (the model controlled for the initial household income in 1984) understandably had a higher income by 2001. The model also indicated that households living in large metropolitan areas were more likely to have a higher household income than rural residents, which makes sense, while regional differences were not significant. The number of occurrences of a move was also insignificant. Since frequent moving among renters may have a very different meaning from that among homeowners, the

Table 1. Definitions and description of variables used in the models

Variable name	Definitions	Means or % All households in 1984 ($n = 642$) Unweighted
Dependent Variable:		
Household income in 2001 (log)	Log of household income in 2001	10.74321
(Household income in 2001)	(Household income in 2001 before log transformation)	69846.26
Independent Variables:		
Years of owning (log)	Log of owning years between 1984 and 2001 (one is added to the actual number before logging to keep those cases with zero owning years in the log transformation)	1.693938
(Years of owning)	(Actual number of owning years before log transformation)	7.598131
Household income in 1984 (log)	Log of household income in 1984	10.20189
(Household income in 1984)	(Actual household income in 1984 before log transformation)	36155.22
Less than high school (1984)	1 = Less than high school in 1984; 0 = Otherwise	23.75
High school (1984)	1 = High school in 1984; 0 = Otherwise	34.69
Some college (1984)	1 = Some college in 1984; 0 = Otherwise	19.06
College + (1984)	1 = College or more education in 1984; 0 = Otherwise	22.50
Household net wealth 1984 (log)	Log of household net wealth in 1984	6.988813
(Household net wealth 1984)	(Actual household net wealth in 1984 before log transformation)	27348.62
Household head age in 2001 (log)	Log of age of household head in 2001	3.466328
(Household head age in 2001)	(Actual age of household head in 2001)	33.82399
Minority status in 2001	1 = Household head is minority; 0 = Otherwise	29.60
Married couples in both 1984 and 2001	1 = Yes; 0 = No	40.34
Single male-headed in both 1984 and 2001	1 = Yes; 0 = No	11.21
Single female-headed in both 1984 and 2001	1 = Yes; 0 = No	25.39
From single male-headed in 1984 to married couples in 2001	1 = Yes; 0 = No	15.26
From single female-headed in 1984 to married couples in 2001	1 = Yes; 0 = No	0.31
From married couples in 1984 to single male-headed in 2001	1 = Yes; 0 = No	6.54
From married couples in 1984 to single female-headed in 2001	1 = Yes; 0 = No	0.93

Table 1. *Continued*

Variable name	Definitions	Means or % All households in 1984 (n = 642) Unweighted
Northeast (2001)	1 = Living in Northeast in 2001; 0 = Otherwise	14.95
Mid-West (2001)	1 = Living in North Central in 2001; 0 = Otherwise	29.75
South (2001)	1 = Living in South in 2001; 0 = Otherwise	36.76
West (2001)	1 = Living in West in 2001; 0 = Otherwise	18.54
Large metropolitan (2001)	1 = Living in largest city in MSA's population 500 000 or more in 2001; 0 = Otherwise	18.22
Other metro (2001)	1 = Living in largest city in MSA's population 50 000 to 499 999 in 2001; 0 = Otherwise	36.45
Small city (2001)	1 = Living in largest city in county's population 10 000 to 49 999 in 2001; 0 = Otherwise	29.60
Rural (2001)	1 = Living in largest city in county's population less than 10000 or no city in county in 2001; 0 = Otherwise	15.73
Frequency of moving (log)	Log of number of times moved between 1984 and 2001 (1 is added before logging to keep cases that moved 0 times)	1.245425
(Frequency of moving)	(Actual number of moving times between 1984 and 2001)	3.257009
Education improved (1984–2001)	1 = Yes; 0 = No	27.10
Both spouses worked in 2001	1 = Yes; 0 = No	40.81

Table 2. Estimates of household income based on model results

$n = 642$ Dependent variable = logged household income in 2001	Model 1	Model 2	Model 3	Model 4
Intercept	10.63460	10.63639	10.63639	8.75274
	0.50890***	0.50743***	0.51128***	0.36901***
Years of owning (log)	0.12611	0.11695	0.11134	
	0.03014 ***	0.03022 ***	0.02986 ***	
(Years of owning)				0.02147
				0.00545***
Household income in 1984 (log)	0.19426	0.18753	0.18641	0.18365
	0.03486***	0.03473***	0.03428***	0.03422***
Less than high school (1984)	Reference	Reference	Reference	Reference
High school (1984)	0.16714	0.17156	0.15622	0.15533
	0.08005*	0.08003*	0.07909*	0.07948 ~
Some college (1984)	0.45996	0.45438	0.44019	0.43035
	0.09464***	0.09440***	0.09325***	0.09387***
College + (1984)	0.63330	0.65681	0.63476	0.61766
	0.09236***	0.09258***	0.09155***	0.09230***
Household net wealth 1984 (log)	0.01291	0.01201	0.01331	0.01347
	0.00795	0.00795	0.00786 ~	0.00785 ~
Household head age in 2001 (log)	− 0.66144	− 0.63502	− 0.56716	
	0.10549***	0.10636***	0.10629***	
(Household head age in 2001)				− 0.01403
				0.00275***
Minority status (2001)	− 0.08259	− 0.08531	− 0.09800	− 0.10533
	0.07300	0.07323	0.07236	0.07261
Married couples in both 1984 and 2001	Reference	Reference	Reference	Reference
Single male-headed in both 1984 and 2001	− 0.32828	− 0.36633	− 0.19617	− 0.20303
	0.09860***	0.09872***	0.10591 ~	0.10578 ~
Single female-headed in both 1984 and 2001	− 0.60919	− 0.61252	− 0.41505	− 0.41541
	0.08546***	0.08586***	0.09747***	0.09717***
From single male-headed in 1984 to married	0.02348	0.02699	0.02977	0.03968
couples in 2001	0.08633	0.08570	0.08460	0.08441
From single female-headed in 1984	− 1.26906	− 1.24188	− 1.03425	− 1.07548
to married couples in 2001	0.50094*	0.49736*	0.49357*	0.49312**

Table 2. *Continued*

$n = 642$ Dependent variable = logged household income in 2001	Model 1	Model 2	Model 3	Model 4
From married couples in 1984 to single	−0.43250	−0.42477	−0.23592	−0.23698
male-headed in 2001	0.11934 ***	0.11949 ***	0.12661 ~	0.12657 ~
From married couples in 1984 to single	−0.57257	−0.62180	−0.41757	−0.39827
female-headed in 2001	0.29207 ~	0.31737 ~	0.31723	0.31663
Northeast (2001)	Reference	Reference	Reference	Reference
Mid-West (2001)	−0.02891	−0.01457	−0.02885	−0.03381
	0.09129	0.09133	0.09022	0.09041
South (2001)	−0.10185	−0.10692	−0.10219	−0.10810
	0.09131	0.09103	0.08987	0.08956
West (2001)	−0.14326	−0.14359	−0.14114	−0.15287
	0.10172	0.10118	0.09988	0.09976
Large metropolitan (2001)	0.27759	0.26233	0.26896	0.27765
	0.10419**	0.10481*	0.10348**	0.10351**
Other metro (2001)	0.14815	0.12172	0.13420	0.13581
	0.08793	0.08829	0.08721	0.08715
Small city (2001)	0.09232	0.06308	0.04923	0.04795
	0.08852	0.08876	0.08769	0.08761
Rural (2001)	Reference	Reference	Reference	Reference
Frequency of moving (log)	0.01228	−0.00292	−0.00164	
	0.04804	0.04821	0.04759	
(Frequency of moving)				0.01049
				0.01210
Education improved (1984–2001)		0.14128	0.14163	0.14001
		0.06479	0.06396**	0.06356*
Both spouses worked in 2001			0.31336	0.31292
			0.07636***	0.07638***
Adj. R-square	0.4855	0.4780	0.4914	0.4920
R-square	0.5025	0.4964	0.5100	0.5106
DF	21	22	23	23

Notes: ~$p < 0.10$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

insignificance in the coefficient of this variable is possibly a result of this difference. Further investigation is needed for better understanding.

Model 2 helped to test the hypothesis that homeowners had higher household incomes in 2001 simply because of the 'cultivating' effect of homeownership through improved education as an outcome of homeownership. Adding a dummy variable on whether the education level of a household head had been improved helped to control for such a 'cultivating' effect. The coefficient for the variable of owning years mainly remained, with only a slight reduction, indicating that even after controlling for such a 'cultivating' effect, longer duration of homeownership was still associated with higher household incomes in 2001.

Model 3 helped to further control for the possibility that homeowners had higher household incomes in 2001 simply because they put in more labor effort. By adding a dummy variable on whether both spouses worked during the year, results from the model indicated that, even after further controlling for such a factor, longer duration of homeownership was still associated with a higher household income in 2001. This suggests that other mechanisms such as investment returns, cash-out refinances, reverse mortgages or more subtle psychological changes in self-esteem, attitude and behavior changes brought by homeownership may have contributed to the observed higher household income in 2001 for those having longer duration of homeownership throughout the period between 1985 and 2001.

According to Model 3, both education improvement and spouses working had a significant impact on household income in 2001. The model estimated that with an improved education level of the household head, household income could expect to be about 15 per cent higher than otherwise, and if both spouses worked in 2001, their household income would be over 30 per cent higher than otherwise.

Model 4 repeated Model 3 but used the continuous independent variables on years of owning, moving times and age of household head in the original values without log transformation. It estimated that for each additional year of homeownership during the period between 1985 and 2001, the household could expect its income to be higher by about 2.1 per cent per year. Therefore, for those who became homeowners in 1985 and remained so, the expected household income by 2001 was approximately 34 per cent higher than those who remained as renter households throughout the entire period.

Conclusion

Following a recent study by Haurin & Rosenthal (2005), this study provides further empirical evidence that homeownership and its duration are positively associated with future household incomes by using a different data source with a more representative sample. Using the longitudinal PSID data and following up renters in 1984, it was found that, even with the same amount of initial income in 1984, longer duration of homeownership after 1984 was associated with a significantly higher future household income in 2001. According to model estimates with a log transformed independent variable, those who owned homes for about 16 years between 1985 and 2001 were likely to have an approximately 11 per cent higher household income by 2001, compared with those who owned homes for only about eight years during the same period. Those who owned homes for only about four years expected household incomes approximately 11 per cent less than those owning for eight years by 2001. Estimates from the model without log transformation of the independent variable suggest that for each additional year in homeownership the household could expect to have approximately 2.1 per cent higher household income per year by 2001.

What exactly causes this difference in household income in 2001 is still uncertain, but even after controlling for the possible ‘cultivating’ effect of homeownership, such as improved education, and after controlling for the possibility of more labor input with both spouses working at the time, model results still showed a positive association between longer homeownership and higher future household income. Further studies, maybe using structural equation modeling with suitable data, are needed to investigate all possible causal factors. To what extent is home price appreciation and cash-out refinance responsible? How much could be attributed to investment returns on capital gains? How much is due to reverse mortgages? To what extent do homeowners increase their labor market effort? How much does homeownership change the mindset and behavior of homeowners? At least for now, some strong evidence shows that homeowners will have higher future household incomes, one of the benefits of homeownership that few have ever discussed before, something that could be used effectively and powerfully in the promotion of homeownership.

However, this evidence should be used wisely, for the promotion of homeownership is complicated and involves a variety of government policies and programs, ranging from tax deductions for mortgage interest payments to government sponsored enterprises such as Fannie Mae. Given that homeowners will have higher future household incomes, policy makers must be careful that government actions should be fair but mostly help the disadvantaged groups that deserve such public intervention.

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References

Aaronson, D. (1998) A note on the benefits of homeownership. Working Paper Series WP 98-20 (Chicago: Federal Reserve Bank of Chicago).

Ahlbrandt, R. & Cunningham, J. (1979) *A New Public Policy for Neighborhood Preservation* (Westport, CT: Praeger).

Balfour, D. L. & Smith, J. L. (1996) Transforming lease-purchase housing programs for low income families: towards empowerment and engagement, *Journal of Urban Affairs*, 18, pp. 173–188.

Baum, T. & Kingston, P. (1984) Homeownership and social attachment, *Sociological Perspectives*, 27, pp. 159–180.

Belsky, E. S. & Duda, M. (2002) Asset appreciation, timing of purchases and sales, and returns to low-income homeownership, in: N. P. Retsinas & E. S. Belsky (Eds) *Low-Income Homeownership: Examining the Unexamined Goal* (Washington DC: The Brookings Institution).

Belsky, E. & Prakken, J. (2004) Housing wealth effects: housing’s impact on wealth accumulation, wealth distribution and consumer spending. Working Paper W04-13 (Cambridge, MA: Joint Center for Housing Studies of Harvard University).

Boehm, T. P. & Schlottmann, A. M. (2002) Housing and wealth accumulation: intergenerational impacts, in: N. P. Retsinas & E. S. Belsky (Eds) *Low-Income Homeownership: Examining the Unexamined Goal* (Washington DC: The Brookings Institution).

Briggs, X. deSouza (1998) Brown kids in white suburbs: housing mobility and the many faces of social capital, *Housing Policy Debate*, 9, pp. 177–221.

Cisneros, H. G. (1995) *Defensible Space: Deterring Crime and Building Community* (Washington DC: HUD).
Clark, H. (1997) A structural equation model of the effects of homeownership on self-efficiency, self-esteem, political involvement and community involvement in African-Americans. PhD Dissertation, School of Social Work, University of Texas at Arlington.
Coulson, N. E. (2002) Housing policy and the social benefits of homeownership, *Federal Reserve Bank of Philadelphia, Business Review*, Q2.
Coulson, N. E. & Fisher, L. M. (2002) Tenure choice and labour market outcomes, *Housing Studies*, 17, pp. 35–49.
Cox, K. (1982) Housing tenure and neighborhood activism, *Urban Affairs Quarterly*, 18, pp. 107–129.
Danes, S. & Morris, E. (1986) Housing status, housing expenditures and satisfaction, *Housing and Society*, 13, pp. 32–43.
Dennis, J. M. (2003) Panel attrition impact: a comparison of responses to attitudinal and knowledge questions about HIV between follow-up and cross-sectional samples. Research Note, Knowledge Networks.
Di, Z. X. (2001) The role of housing as a component of household wealth. Working Paper W01-6 (Cambridge, MA: Joint Center for Housing Studies of Harvard University).
Di, Z. X., Yang, Y. & Liu, X. (2003) The importance of housing to the accumulation of household net wealth. Working Paper W03-5 (Cambridge, MA: Joint Center for Housing Studies of Harvard University).
DiPasquale, D. & Glaeser, E. L. (1999) Incentives and social capital: are homeowners better citizens?, *Journal of Urban Economics*, 45, pp. 354–384.
Doling, J. & Stafford, B. (1989) *Homeownership: The Diversity of Experience* (Aldershot: Gower).
Essen, J., Foglman, K. & Head, J. (1978) Childhood housing experiences and school attainment, *Child Care, Health and Development*, 4, pp. 41–58.
FannieMae (1992) *FannieMae National Housing Survey* (Washington DC: FannieMae).
Galster, G. C. (1987) *Homeowners and Neighborhood Reinvestment* (Durham, NC: Duke University Press).
Goetzmann, W. N. & Spiegel, M. (2002) Policy implications of portfolio choice in underserved mortgage markets, in: N. P. Retsinas & E. S. Belsky (Eds) *Low-Income Homeownership: Examining the Unexamined Goal* (Washington DC: The Brookings Institution).
Goodman, J. (1997) The costs of owning and renting housing: 1985–1995. Working paper (Washington, DC: National Multi-Housing Council).
Green, R. & White, M. (1997) Measuring the benefits of homeowning: effect on children, *Journal of Urban Economics*, 41, pp. 441–461.
Guest, A. W. & Oropesa, R. S. (1986) Informal social ties and political activity in the metropolis, *Urban Affairs Quarterly*, 21, pp. 550–574.
Harkness, J. & Newman, S. (2003) Differential effects of homeownership on children from higher- and lower-income families, *Journal of Housing Research*, 14, pp. 1–9.
Haurin, D. R. & Rosenthal, S. T. (2005) *The Growth Earnings of Low-Income Households and the Sensitivity of their Homeownership Choices to Economic and Socio-Demographic Shocks*, A report published by US Department of Housing and Urban Development, Office of Policy Development and Research, Washington DC.
Haurin, D. R., Hendershott, P. H. & Wachter, S. M. (1996) Wealth accumulation and housing choices of young households: an exploratory investigation, *Journal of Housing Research*, 7, pp. 33–57.
Haurin, D. R., Parcel, T. L. & Haurin, R. J. (2002) Impact of homeownership on child outcomes, in: N. P. Retsinas & E. S. Belsky (Eds) *Low-Income Homeownership: Examining the Unexamined Goal* (Washington DC: The Brookings Institution).
Hoffmann, L. & Heistler, B. (1988) Home finance: buying and keeping a house in a changing financial environment, in: E. Huttman & W. van Vliet (Eds) *Handbook of Housing and Built Environment in the United States* (New York: Greenwood).
Hubbard, M. & Davis, W. (2002) *Community Advantage Panel Study: Social Impacts of Homeownership* (Chapel Hill, NC: Center for Community Capitalism, Kenan Institute of Private Enterprise).
HUD (US Department of Housing and Urban Development) (1995) Homeownership and its benefits, *Urban Policy Brief*, 2.
Ibbotson, R. & Siegel, L. (1984) Real estate returns: a comparison with other investments, *Journal of the American Real Estate and Urban Economics Association*, 12, pp. 219–242.
JCHS (Joint Center for Housing Studies at Harvard University) (2003, 2004, 2005 etc.) *The State of the Nation's Housing*, Annual report from JCHS.
Kingston, P. & Fries, J. (1994) Having a stake in the system: the sociopolitical ramifications of business and home ownership, *Social Science Quarterly*, 75, pp. 679–686.

Kinsey, J. & Lane, S. (1983) Race, Housing Attributes, and satisfaction with Housing, *Housing and Society*, 10(3), pp. 98–116.

Lam, J. (1985) Type of Structure, Satisfaction and Prospensity to Move, *Housing and Society*, 12(1), pp. 32–34.

Lane, S. & Kinsey, J. (1980) Housing tenure status and housing satisfaction, *Journal of Consumer Affairs*, 14(Winter), pp. 341–354.

Lang, R. E. & Hornburg, S. (1998) What is social capital and why is it important to public policy?, *Housing Policy Debate*, 9, pp. 1–6.

Lauria, D. (1976) Wealth, capital and power: the social meaning of home ownership, *Journal of Interdisciplinary History*, 7, pp. 261–282.

Lillard, L. A. & Panis, C. W. A. (1998) Panel attrition from the PSID: household income, marital status, and mortality, *Journal of Human Resources*, 33, pp. 437–457.

Lyons, W. & Lowery, D. (1989) Citizen responses to dissatisfaction in urban communities: a partial test of a general model, *Journal of Politics*, 15, pp. 841–868.

McCarthy, G., Van Zandt, S. & Rohe, W. M. (2001) The economic costs and benefits of homeownership: a critical assessment of the research. Working Paper 01-02 (Washington DC: Research Institute for Housing America).

Megbolugbe, I. F. & Linneman, P. D. (1993) Home ownership, *Urban Studies*, 30(4/5), pp. 659–682.

MHC (The Millennial Housing Commission appointed by the Congress of the United States) (2002) *Meeting Our Nation's Housing Challenges*.

Morris, E. & Winter, M. (1976) Housing Norms, Housing Satisfaction and the Propensity to Move, *Journal of Marraige and the Family*, 38(2), pp. 309–20.

Oswald, A. (1996) A conjecture on the explanation for high unemployment in the industrial nations. Working paper (Warwick: University of Warwick).

Oswald, A. (1997) Thoughts on NAIRU (correspondence), *Journal of Economic Perspective*, 11, pp. 227–228.

Oswald, A. (1999) The housing market and Europe's unemployment: a non-technical paper. Working paper (Warwick: University of Warwick).

Rohe, W. M. & Basolo, V. (1997) Long-term effects of homeownership on the self-perceptions and social interaction of low-income persons. *Environment and Behavior*, 29, pp. 793–819.

Rohe, W. M. & Stegman, M. (1994) The impacts of home ownership on the self-esteem, perceived control and life satisfaction of low-income people, *Journal of the American Planning Association*, 60, pp. 173–184.

Rohe, W. M. & Stewart, L. S. (1996) Home ownership and neighborhood stability, *Housing Policy Debate*, 7, pp. 37–81.

Rohe, W. M., van Zandt, S. & McCarthy, G.(2002) Home Ownership and Access to Oppurtunity, *Housing Studies*, 17(1), pp. 51–61.

Rossi, P. H. & Weber, E. (1996) The social benefits of homeownership: empirical evidence from national surveys, *Housing Policy Debate*, 7, pp. 1–35.

Saunders, P. (1990) *A Nation of Home Owners* (London: Unwin Hyman).

Sherraden, M. (1991) *Assets for the Poor: A New American Welfare Policy* (Armonk, NY: M. E. Sharpe, Inc.).

Smith, W. (1970) *Housing: The Social and Economic Elements* (Berkeley, CA: The University of California Press).

Tremblay, K. & Dillman, D. (1983) *Beyond the American Housing Dream: Accommodation to the 1980s* (New York: University Press of America).

Varady, D. (1983) Determinants of residential mobility decisions, *Journal of the American Planning Association*, 49, pp. 184–199.