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Housing and Wealth Accumulation: Intergenerational Impacts

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Abstract

It has long been argued that promoting homeownership among low-income households is worthwhile because owned housing may be an important source of savings for these families, and that children raised in owned housing are likely to be more successful well-adjusted members of society. This paper employs the Panel Study of Income Dynamics and a dynamic estimating technique to examine the effect of parents' housing choices on the likelihood of homeownership and wealth accumulation by their children.

The analysis demonstrates that children of homeowners are more likely to own sooner than are children of renters. Also, they are more likely to achieve higher levels of education and, therefore, income. These results lead to substantially higher levels both of housing and non-housing wealth accumulation for the children of owners. In addition, for lower income households, housing wealth proves to be a particularly important component of total wealth accumulation.

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A Nation of Homeowners is Unconquerable.

--*Franklin D. Roosevelt*

I. Introduction

As is well known, for over 60 years the federal government has promoted homeownership as a critical component of achieving the "American Dream." Housing policy has formed a significant cornerstone of the nation's "poverty agenda." as well as representing a separate policy initiative. Two specific examples from the past decade illustrate this point. In 1991, *The President's National Urban Policy Report,* issued by the U.S. Department of Housing and Urban Development, contained six priorities that formed the department's poverty agenda. One of these priorities was to encourage homeownership and expand affordable housing opportunities. More recently, the Clinton administration directed HUD to work with the housing industry and a number of private non-profit organizations to develop a "National Home Ownership Strategy".

A recent analysis by Orr and Peach (1999) has reconfirmed the significant financial commitment that families are willing to bear in order to achieve homeownership. The financial commitment (average housing costs as a percentage of family income) associated with lower income households is striking. As discussed by Orr and Peach (1999), the percentage commitment runs from 40 to 60 As outlined in Mayer (1999), when the financial risks to lower income households of homeownership are recognized, the "demand" by American families to own is quite strong.

This paper focuses on developing a clear picture of the impact of income and wealth on the transition to homeownership. It examines specifically the process of wealth accumulation and the savings/investment dynamic for young households. These relationships are critical to the transition to homeownership and *subsequent* wealth accumulation. In particular, our paper also stresses the role of parental homeownership on the *timing* of transition to homeownership and, ultimately, wealth accumulation of the next generation. In this regard, we briefly discuss three recent strands of the literature in housing economics.

In the 1980s an extensive empirical literature developed to determine the factors affecting homeownership. An interesting set of studies is referenced in Boehm (1993) and

Henderson and Ioannides (1986). In general, the literature concluded that income, relative prices, and a family's life-cycle situation were the primary factors that determine the likelihood of a home purchase. The role of permanent income in the demand for housing was also established, as for example, in Goodman and Kawai (1982) and Ihlandfelt (1980). However, the dynamics of wealth accumulation and intergenerational transfers were generally treated in fairly abstract terms, if at all.

Recent literature has tended to emphasize three general themes, all of which share a dynamic element. The first theme involves the interaction of homeownership and wealth. For example, the recent work of Gyourko, Linneman, and Wachter (1999) explores the role of wealth in the context of differential rates of homeownership by race. They find no racial differences in ownership rates among households who have wealth sufficient to meet down payment and closing requirements. However, significant differences in ownership rates occur in "wealth-constrained " households.

Several studies investigate the special role of homeownership in wealth accumulation and its relationship to tenure choice. In a series of interesting studies, Haurin, Hendershott, and Wachter (1996b, 1996c) explore wealth accumulation and housing choices of young households. Their empirical results confirm the joint nature of housing choice and wealth accumulation. On the one hand, homeownership is an important component of total wealth; conversely, households need a minimal level of wealth to purchase their first home, given financing requirements. Other authors have analyzed the response of savings to differential housing prices with the studies by Sheiner (1995) and Englehardt (1995) of particular interest. Although results in some studies are contradictory, in general young households save more in cities with higher housing prices (relative to downpayment requirements). These results tend to confirm the high degree of "preference" for homeownership. The role of intergenerational transfers has been addressed in several studies, of which the work by Gale and Scholz (1994) is particularly noteworthy. Not surprisingly, parental transfers can be crucial for the transition to homeownership of young households. Gifts related directly to housing markets are analyzed in Englehardt and Mayer (1994). Their results are consistent with those of Gale and Schlotz (1994).

The second theme that has appeared in recent literature centers specifically on the role of downpayment requirements and other "borrowing constraints" on tenure choice.

Clearly this issue relates to the theme of wealth accumulation and intergenerational transfers as well, but Haurin, Hendershott, and Wachter (1996a) explore mortgage-borrowing constraints in detail. In their study, even after income and wealth requirements are factored in, approximately 37 percent of young households remain constrained. This result seems consistent with recent theoretical work relating homeownership to asset allocation in the context of a household's wealth portfolio. Two studies of particular note are those by Chinloy (1996) and Flavin and Yamashita (1998). All of these studies suggest that tenure choice and wealth accumulation need to be considered in a dynamic context.

The third theme has appeared recently in the literature and relates to the "social" impacts of homeownership. As Mayer (1999) has observed, "Although the claimed benefits of homeownership are many, the empirical evidence in favor of these hypotheses is scant." Three recent studies that have appeared include Boehm and Schlottmann (1999), Glaeser and DiPasquale (1998), and Green and White (1997). Green and White (1997) and Boehm and Schlottmann (1999) pay particular attention to the benefits of parental homeownership on children. While at first glance, this theme might appear to be somewhat separate from the literature on first-time homeownership, actually it is directly connected. For example, children in owner-occupied homes appear to successfully complete higher levels of education. This result holds across similarly situated households by income (*including low-income households*). As reviewed in Polachek and Siebert (1993), increased educational attainment is associated with higher earnings in the vast majority of studies on earnings. If so, then this third theme in the literature suggests a "feedback" to savings behavior and the transition to homeownership.

Thus, the established and more recent literature in housing economics suggests a heuristic model that may be summarized as follows:

1. Children of homeowners are more "successful," measured by such factors as lower teenage pregnancy rates and higher educational attainment. Although the precise mechanisms for this success are not well documented, the result appears to be (statistically) valid for low-income households. Higher levels of educational attainment are associated with higher levels of earned income and changes in earned income. This directly impacts household savings.
2. Higher household savings (and permanent income) lead to quicker transitions to

homeownership and thereby, greater accumulation of housing wealth because of the increased length of time in which house price appreciation and loan amortization can take place.

3. In addition, ownership by parents also gives rise to a preference for ownership on the part of children. If ownership is more likely to occur at an earlier point in time for children of parents who own, this should also lead to an increase in housing wealth accumulation through increased appreciation and amortization over time.

Model Specification

Two primary equations must be estimated in order to calculate the expected non-housing and housing wealth accumulation. The first equation to be estimated provides the likelihood of homeownership, while the second focuses on non-housing wealth accumulation.

It is important to point out that the empirical approach employed in this analysis allows a more appropriate means of capturing housing dynamics than heretofore has been presented in the literature. Specifically three significant aspects of dynamic housing choice can be modeled. First, the sequencing of housing choice is modeled in continuous time rather than simply as the occurrence of the event. For example, homeownership is not a simple binary "event" that can occur at any time during the period of the study, but rather is related to the specific year that homeownership is attained. Second, unlike traditional hazard models that measure the time until an event, such as homeownership, occurs and relate it to average measures of causal factors (i.e., values at the beginning of period, end of period, etc.), our approach employs true time-varying covariates. For example, over a time period such as 1984–1993 our independent variables (such as household income) change with each year of observation. Finally, by estimating a second set of equations over the period, (i.e., change in non-housing wealth accumulation and the level of housing expenditure), predicted values are generated for these dependent variables. Combining these estimated values with the cumulative probabilities of homeownership estimated in the hazard model, a more dynamically accurate picture of wealth accumulation (and housing's role in the process) can be painted than has previously appeared anywhere in the literature.

Continuous Time Model of Homeownership

Let T represent the time until ownership is achieved for an individual family measured from some reference point. In this analysis the reference point is the time at which the household

head left his/her parents' home to form his/her own household. In addition, let *t* represent calendar time measured from the same reference point. Thus, the likelihood that a family is still renting at calendar time *t* is *P* = PR(T>t). This probably must be determined indirectly by first estimating the hazard function *h*, the likelihood that $T > t$ given that the household achieves ownership in a very small time interval from *t* to $t + \Delta t$. This, hazard rate can be made a function of a set of time-varying exogenous variables.

This function can be specified more formally as

$$h = \lim_{\Delta t \to 0} \frac{\Pr(T > t \mid t < T < t + \Delta t)}{\Delta t}$$

$$= \exp[\alpha + I?\beta I + PC?\beta PC + W?\beta W + X?\beta X] ? t\gamma_1, \qquad (1)$$

where

I = household income which varies over time

PC = parental characteristics of the head of household

W = household's current level of non-housing wealth which varies over time

X = vector of independent variables describing the household and identifying the type of housing market in which the household resides, all of which are time-varying

βI, βPC, βW, and βX = estimated coefficients that correspond to the various independent variables.

From this estimated hazard function the probability of achieving homeownership can be calculated as

$$P = \sum_{k=1}^{m} \int_{\alpha_{k-1}}^{\alpha_k} h(t) \exp\left[- \int_0^t h(u) du \right] dt, \qquad (2)$$

where:

m = the total number of time periods (years, months, weeks, etc.) in *T*

αk = k/m.

Non-Housing Wealth Accumulation

Continuous time duration models of the type described above provide superior insights into the intertemporal dynamics of economic relationships. To estimate the hazard function, these

models make use of all the information available in a panel data set on the timing of change from one economic state of existence to another, as well as the timing and magnitude of changes in the values of the independent variable hypothesize to influence the transition from one state of existence to another. As an extension of this analysis, it is also possible, in a set of secondary equations, to model and empirically estimate the changes in the independent variables included in the hazard function. In this context, one would anticipate that transitory and expected income will be the primary determinants of the accumulation of non-housing wealth and, therefore, current levels of non-housing wealth in future time periods. More formally,

$$\Delta NHW_{t-1,t} = \beta\Delta Tr \cdot \Delta Tr_{t-1,t} + \beta I \cdot I_{t-1} + \beta w?NHW_{t-1} + \beta\Delta I?\Delta I_{t-1,t} + \beta X?X_{t-1} + \varepsilon, \quad (3)$$

Where:

$\Delta NHW_{t-1,t}$	= change in household non-housing wealth between one period and the next
$\Delta Tr_{t-1,t}$	= income transfers to the household between *t-1* and *t*
I_{t-1}	= income of the household in the initial period
NHW_{t-1}	= non-housing wealth in period *t-1*
$\Delta I_{t-1,t}$	= change in income between *t-1* and *t*
X_{t-1}	= a vector of other control variables that could affect wealth accumulation
βI, βPC, βW, and βX	= coefficients to be estimated that correspond to the various independent variables.
ε	= error term with mean = 0 and variance = 1.

Calculation of Expected Non-Housing and Housing Wealth Accumulation

Once the equations specified above have been estimated, expected non-housing and housing wealth accumulation can be calculated as follows:

$$E(NHW)_n = NHW_o + \left[\Delta NHW_{t-1,t} \cdot \sum_{t=1}^{n} (1+i)^n \right] \quad (4)$$

where:

$E(NHW)n$	= expected non-housing wealth at time *n*
$NHWo$	= non-housing wealth at 0

ΔNHWt-1,t = estimated change in non-housing wealth over one time period.

i = the interest rate at which savings can be invested.

$$C\,Pr(Own)_t = \sum_{t=1}^{m}\left\{\left[1-\exp^{-\exp(\beta X_t)\cdot H(\alpha_t,\gamma)}\right]-\left[1-\exp^{-\exp(\beta X_t)\cdot H(\alpha_{t-1},\gamma)}\right]\right\} \quad (5a)$$

where:

CPr(Own)t = the cumulative probability of achieving ownership by the end of period *t*

BXt = vector of coefficients estimated in eq. (1) multiplied by the corresponding variable values in period *t*

H(αt, γ) = αtγ+1 / (γ + 1) for the Weibull hazard

αt-1 = {[-1n(1 - CPr(Own)t-1)/exp(βXt)] ? (γ+1)}1/(γ+1)

αt = αt-1 + 1/m.

$$E(HW)_n = \sum_{t=1}^{n} w_t \cdot \left(AM_t + \Delta HV_t\right)\cdot C\,Pr(Own)_n \quad (5$$

$$w_t = CPr(Own)_t / \sum_{t=1}^{n} CPr(Own)_t$$

where:

E(HW)n = expected housing wealth in year *n*.

Amt = amount of amortization that will occur between period *t* and period *n*, e.g., if *n* = nine years and an individual purchases in year 1, there will be eight years in which amortization can take place.

ΔHVt = the appreciation in house value that takes places between periods *t* and *n*.

CPr(Own)n = the cumulative probability of owning by period *n*.

In equation (4), changes in non-housing wealth will be calculated based on estimates of ΔNHWt-1,t using coefficients obtained from the estimation of equation (3). Similarly, equations (5a) and (5b) will be calculated using the coefficients obtained by estimating equation (2). These equations can be used to estimate the change in housing and non-housing

wealth accumulation that might be anticipated as the value of a variable influencing one or both of the estimated equation(s) changes. In particular, in the simulations presented subsequently, the focus is on whether or not the parents of the child were homeowners.

II. Data

This paper employs the Panel Study of Income Dynamics (PSID) as collected by the Survey Research Center at the University of Michigan. During the period 1968 through 1992 not only did the survey continue to follow as many of the original 5,000 American families as possible, but it also followed children as they "split-off" from their parents' households. The explicit following of children and associated new household formation is a unique feature of the survey and is central to this analysis.

In order to investigate the dynamics of wealth accumulation and homeownership, children who formed new households between 1980 and 1984 were included. Each new household is subsequently followed for the next nine years in this sample. Because the number of new households (split-offs) is small, the five years of split-offs are pooled for the analysis. The total number of households available for the analysis is 878 (with complete savings data over the period available for 855 households).

Both the tenure analysis and the estimation of savings (for the period 1984–1989) are partitioned into two subgroups, namely those households whose real family income was above and below the median (in 1984). Of particular interest are any implications of the analysis for the lower income households. The number of households in each income group is, of course, approximately 440.

III. Empirical Analysis

Tenure Choice

As shown in Figure 1, variables included in the ownership equation comprised several factors. Based upon the literature discussed above, personal characteristics such as age of the household head, marital status, and gender, race, and educational attainment were included. In addition, other life-cycle factors such as family size were included in the analysis. Wealth and estimates of permanent income were incorporated as well. As discussed above, a set of

parental characteristics and information on location (city size, census division, etc.) was also available for the analysis. Finally, a set of (binary) variables representing the year of household formation (split-off from the parents' household) was included.

Three separate hazard functions, corresponding to equation (1) and equation (2) above, were estimated and are shown in the columns of Figure 1. The three estimated equations represent the entire sample, the higher income households in the sample, and the set of lower income households. Households with higher permanent income (and changes in permanent income) have a higher likelihood of homeownership. The crucial role of the level of wealth (savings) is also clearly demonstrated. Where significant, estimates on other variables appear to be consistent with prior literature.

One result of particular interest across all three sets of households relates to the estimated parameter of "time in state" in the hazard function. Specifically, no evidence is found of (negative) duration dependence in the model when wealth and income are included. As discussed above, the recent paper by Orr and Peach (1999) and the commentary of Mayer (1999) tend to confirm the strong desire for homeownership among all households classified by family income. In other words, *ceteris paribus*, households in the sample do not lose the desire for homeownership even if they have been renting for a considerable time. If their household income and wealth position allows a transition to homeownership, these families are just as likely to make the move to homeownership after years of renting, as they would have been earlier.

Based upon the previous discussion of the literature, a variable was included that captures whether or not the parents of a household head were homeowners. The wealth equation (discussed below) already controls for gifts and inheritances, and changes in wealth from a relative joining the "new" household. In addition, the level of parental non-housing wealth and income are included directly in the estimation of this equation as control variables. In this context, it is particularly interesting that children raised in owner-occupied homes appear to have a "preference" for homeownership. As noted above, Green and White (1997) and Boehm and Schlottmann (1999) find that parental homeownership significantly impacts children. In this analysis, the results suggest a strong preference for homeownership among those who have experienced homeownership first hand. Indeed, the results suggest, *ceteris paribus*, that if more families are able to achieve homeownership today, there will be

a substantially higher proportion of children striving for and achieving homeownership tomorrow. The statistical insignificance of parental homeownership for the lowest income households might reflect the fact that, for the poorest of these young families, the income and wealth constraints are too severe for homeownership, irrespective of preferences. This result seems consistent with the research of Haurin et al. (1996a).

Figure 1: Parameter Estimates for Homeownership Transition

Variable	Full Sample	Higher Income Households[b]	Lower Income Households[b]
Constant	-2.581***	-2.242***	-2.391***
Personal Characteristics			
Age	0.029***	-0.019	0.021**
Single female	-0.913***	-.0810***	-.0.967***
Single male	-0.798***	-0.624***	-0.789***
African American	-0.231*	-0.015	-0.389**
Hispanic	-0.191	-0.040	-1.107
Veteran	-0.273**	-0.199	-0.238*
Time disabled	-0.242	-0.188	-0.242
Education			
College education or more	-0.057	0.002	-0.335
Some post-secondary	-0.216	-0.177	-0.263
High school graduate	-0.258	-0.010	-0.747*
Family size	-0.024	-0.033	0.066
Permanent income	0.075***	0.065***	0.062***
Permanent income (squared) [c]	-0.001***	-0.001***	-0.001***
Non-housing wealth	0.001***	0.001***	0.010***
Parents Characteristics	0.411***	0.555***	0.096
Homeownership			
Non-housing wealth	0.001	-0.000	0.001
Income	0.002	0.001	0.011**
Residence			
Large metropolitan	0.551***	0.740***	0.368
Other metro	0.744***	0.689***	0.799**
Small city	1.304***	1.267***	1.346***
Census division[d]			
Year of husehold formation[e]			
Time in state[f]	-0.060	-0.691	-0.053
Psuedo R^2	0.343	0.319	0.341

[a]All variables are defined in the text, N=878.

[b]Based upon median income (rounded to nearest thousand dollars). The higher income sample consists of 437 households, while the lower income sample comprises 441 households.

[c]Times $10.^{-1}$

[d]Eight regional dummy variables were included, but their coefficient estimates are omitted here.

[e]Four dummy variables representing the year of split-off from the parent household were included but are not reported here.

[f]Estimate from the Weibull form of the hazard.

Wealth Accumulation

Figure 2 presents parameter estimates of household change in (non-housing) wealth over the period 1984-1989 for the sample of children who left their parents' home to establish their own households between and including 1980 through 1984. Not only do changes in wealth occur from savings but also from income transfers. As shown in Figure 2, variables included in the analysis consist of personal characteristics of the household head and other life-cycle factors impacting savings behavior such as family size. Except for the lower change in wealth for African Americans among higher income households, personal characteristics do not explain wealth accumulation per se.

Given the primary concern of this analysis, the impact of income, gifts, and parental wealth on savings is of particular interest. These "traditional" economic variables are the key to explaining changes in non-housing wealth over the period. In general, these variables impact wealth accumulation as expected in each of the three equations shown in Figure 2.

Figure 2: Parameter Estimates for Change in Non-Housing Wealth 1984-1989[a]

Variable	Full Sample	Higher Income Households[b]	Lower Income Households[b]
Constant	-39,940**	-67,163*	234.517
Personal Characteristics			
Age	997.406*	1878.297*	199.051
Single female	-7,250	-23,651	-5,352
Single male	-2,523	-15,164	-3,725
African American	-6271	-19,567*	-3,085
Hispanic	-548	4,408	-5,955
Family size	-757	-2430	-895
Gifts and Wealth			
Gifts and Inheritances (1984–1989)	1.194***	1.205***	.888***
Non-housing Wealth[c]	-0.849***	-0.872***	-0.337***
Change in wealth from change in family composition[c]	0.001	0.001	0.274***
Income	1,339***	1,627***	-0.025
Change in family income	-0.707***	.765***	0.257***
Parental wealth	2.887	.953	20.582**
R^2	0.508	0.519	0.350

[a]All variables are defined in the text. The number of observations is 855 with 432 in the high-income equation and 423 in the low-income equation.
[b]Based upon median income, see Figure 1.
[c]All levels are measured in 1984. All change variables are defined as changes between 1984 and 1989.

However, the interesting questions revolve around differences in the accumulation of wealth between high-income and low-income households. As shown in Figure 2, low-income households accumulate less wealth over the period per dollar of "gifts" than higher income households. This suggests that some amounts of the transfers are utilized in household consumption. Among lower income households, the insignificance of the income variable but not the variable for changes in income seems to be consistent with this observation.

In a similar manner, it is perhaps not surprising that the parameter estimate on wealth changes from new members entering the household (such as aging relatives) is significant only for lower income households. It is particularly interesting that parental wealth is significant for low-income households, suggesting that parental assistance for these households continues even after their formal "split-off" in the data.

The Dynamics of Wealth Accumulation

As presented previously (see equations 4, 5a, and 5b), the cumulative probabilities of achieving homeownership can be calculated based upon the estimation of the entire model (equations 1-3). In addition, an accumulation of wealth composed of both a non-housing and a housing component can be estimated from this system. Subsequently, for any variable that has an estimated impact on this system, its impact on both housing and non-housing wealth accumulation can be calculated. Based upon the interpretation of the recent literature, discussed above, the third theme, namely the impact of parental homeownership on their children's (split-off household's) wealth accumulation is explored. Figure 4 presents estimates of the average change in both housing and non-housing wealth for the full sample and the high- and low-income sub-samples over the nine-year period in which they were under observation for this analysis. In addition, the estimates of the components of the calculation of housing wealth accumulation (see equation 5b) are also presented. These components include the cumulative probability of owning, the amortization of mortgage principal, and house value appreciation after a given year, assuming homeownership is achieved.

Figure 5 presents calculations of the impact of parental homeownership on the wealth accumulation of the children who have split-off to form their own households. Before discussing these results, the mechanisms by which parental homeownership impacts children

should be reviewed. First, the estimates of the likelihood of homeownership for children (Figure 1) demonstrate that parental ownership has a direct link in our calculations through this equation. In addition, the literature discussed earlier suggests that children of homeowners attain higher levels of education. This leads to higher levels of income and savings increasing the cumulative probability of homeownership (Figure 2), and the expected level of expenditure on a home if a household chooses to purchase.

In the estimates of the impact of parental homeownership on children's wealth accumulation, the indirect channels as well as the direct are included in the calculation.
In order to implement a calculation of the indirect effects, an equation similar to that presented in Boehm and Schlottmann (1999) is estimated. Figure 3 demonstrates the impact of parental homeownership on educational attainment in this sample. The impact of parental homeownership on child educational attainment is significant in all (sub) samples.

Consistent with the main results of Green and White (1997), parental homeownership significantly impacts high school graduation among children from lower income households. As noted in the earnings studies cited in Polachek and Siebert (1993), a major lifetime income break by educational attainment occurs between individuals who complete high school compared to those who dropout.

Figure 3: Determinant of Child's Educational Attainment: Home Ownership by Parents

Sample [a]	Highest Educational Attainment [b]		
	High School Graduate	Some Post-Secondary Education	College Graduate or Higher
Full sample	.721***	.297	.827***
Less upper income quartile	.829***	.424	.901***
Low-income households	1.274***	.706***	1.260***

[a]The sample sizes for the three samples are 864 observations in the full sample, 647 observations for the full sample less households in the upper income quartile, and 435 observations for parents with household incomes below the median.
[b]The omitted category is "never completed high school."
** Asymptotic *t*-test significant at the 0.05 level.
*** Asymptotic *t*-test significant at the 0.01 level.

In Figure 4 both average housing and non-housing wealth accumulation are presented for each (sub) sample over time. The three factors presented in columns 4, 5, and 6 of the Figure (house value appreciation, loan amortization, and the cumulative probability of ownership) are combined as set forward in equation (5b) to produce the cumulative housing wealth amounts presented in the third column of the figure. A number of insights can be

gained about the dynamics of the housing choice and wealth accumulation from this table. For example, considering the cumulative probabilities of homeownership, the lower income sample never gets above a 26.91 percent chance of achieving homeownership. However, on average, the higher income group has achieved this likelihood of homeownership within the first three years of independent existence as a household. The difference in the ability of these two groups to accumulate non-housing wealth is equally clear. In addition, the value of the housing that higher income households are likely to buy is substantially higher, as is demonstrated indirectly by the house value appreciation calculations presented in the fourth column of Figure 4.

Figure 4: Components of Wealth Accumulation

Full Sample

Years	Cumulative Non-Housing Wealth	Cumulative Housing Wealth	Appreciation In House Value	Loan Amortization	Cumulative Ownership Probability Percent
1	$5,592	$1,030	$44,520	$3,384	6.84
2	$9,427	$2,893	$39,487	$3,010	12.82
3	$13,302	$5,489	$34,620	$2,647	18.36
4	$17,093	$8,796	$30,094	$2,307	23.61
5	$20,926	$12,706	$24,791	$1,906	28.58
6	$24,759	$16,976	$18,509	$1,427	33.10
7	$29,119	$21,484	$12,204	$943	37.37
8	$34,511	$26,136	$6,011	$466	41.47
9	$41,734	$31,077	$0	$0	45.44

High Income

Years	Cumulative Non-Housing Wealth	Cumulative Housing Wealth	Appreciation in House Value	Loan Amortization	Cumulative Ownership Probability Percent
1	$10,489	$2,876	79930	$4,779	12.73
2	$16,387	$7,596	67184	$4,074	22.96
3	$22,387	$13,660	56736	$3,490	31.66
4	$28,183	$20,861	47954	$2,990	39.27
5	$34,081	$28,887	38742	$2,448	45.99
6	$39,979	$37,175	28334	$1,813	51.79
7	$46,584	$45,527	18423	$1,194	57.02
8	$54,600	$53,744	8928	$585	61.81
9	$65,201	$62,034	0	$0	66.21

Low Income

Years	Cumulative Non-Housing Wealth	Cumulative Housing Wealth	Appreciation in House Value	Loan Amortization	Cumulative Ownership Probability Percent
1	$739	$193	14532	$2,006	2.54
2	$2,537	$637	14534	$1,968	5.31
3	$4,337	$1,366	13721	$1,824	8.23
4	$6,132	$2,422	12562	$1,639	11.27
5	$7,929	$3,808	10735	$1,376	14.40
6	$9,727	$5,483	8337	$1,050	17.48
7	$11,875	$7,403	5636	$698	20.57
8	$14,650	$9,560	2863	$348	23.70
9	$18,141	$12,068	0	$0	26.91

Figure 5 presents the impact that parental homeownership has on the wealth accumulation of children. As discussed above, the precise "mechanisms" for these affects is only partially understood. As might be expected, these impacts are highest among high-income households. However, given the significantly low levels of non-housing wealth observed for low-income households ($2,618 was the average level of non-housing wealth for the low income portion of the sample in 1984 as compared to $17,704 for the high income group), the numbers in Figure 5 represent a substantial change in wealth accumulation for everyone.

The results in Figure 5 augment the literature on housing and wealth accumulation by children. Specifically, parental homeownership not only begets future homeownership, but also a greater likelihood of ownership at an earlier time. This earlier likelihood of purchase leads to substantial increase in housing wealth accumulation, which is clearly an important component of wealth accumulation for these households. Finally, it is worth noting that the measurement of these wealth effects was, somewhat arbitrarily confined to the nine-year period in which these households were being analyzed. Certainly, the accumulation of both housing and non-housing wealth will continue throughout the life span of the child's family and, as the analysis demonstrates, have an impact on subsequent generations as well.

Figure 5: Effect of Ownership by Parents on the Wealth Accumulation of Children [a]

Sample	Wealth Accumulation		
	Change in Non-Housing Wealth	Change in Housing Wealth	Total
Full sample	$5,073	$13,069	$18,142
Low income households	$538	$2,065	$2,603
High income households	$5,942	$25,569	$31,511

[a]For the nine year interval in which split-off households tenure choices are observed. In terms of the amortization schedule assigned to a household (given initial homeownership and initial housing value), the assumed mortgage interest rate was 10 percent with an "average" equity downpayment of 10 percent (five percent for the lower income households and 15 percent for the higher income households).

IV. Summary, Policy Implications, and Suggestions for Future Research

This paper has examined the effect of parents' housing choices on the dynamics of homeownership and wealth accumulation of their children. The analysis employs a dynamic duration probability model of homeownership in conjunction with a secondary equation

estimating inter-temporal non-housing wealth accumulation. This model not only demonstrates empirically the direct effect of factors such as parental homeownership on the likelihood of children achieving homeownership, but also the indirect effects through its impacts on household income and savings. It is important to note that the probabilities stemming from this analysis are different than those of a traditional logit model or, for that matter, from a duration model in which the process of wealth accumulation does not affect the likelihood of homeownership.

The results demonstrate the importance of parental homeownership on children. Not only does homeownership provide access to housing wealth, but it also has indirect impacts that are crucial for low-income households. Specifically, parental homeownership indirectly impacts child labor earnings through increased educational attainment that is particularly significant for lower income households. In a similar manner, the recent literature cited above suggests that children from owner-occupied households have fewer social problems, which also seems to augment labor earnings.

This analysis also suggests that parents' housing tenure significantly impacts the likelihood of a child's homeownership directly. The strong preference for homeownership exhibited by those who have grown up in owner-occupied homes suggests not only that owner-occupied housing may indeed be a merit good (i.e. a good that is under consumed by individuals who, because of their lack of experience with homeownership, do not perceive its true benefits), but also that this is a relatively important factor in increasing the wealth accumulation of future generations.

Policy Implications

The primary policy implication in this analysis is that programs designed to stimulate homeownership, particularly among lower income households, have substantial benefits in terms of wealth accumulation, not just for a given set of households, but also for their children. Therefore, depending on the cost, such programs could be particularly beneficial from a societal perspective. However, before making such a general statement, one would want to conduct a comparable analysis on a broader spectrum of homeowners, rather than focusing only on a group of parents and their children's first home purchase.

While a truly general analysis of the above issue is beyond the scope of this paper, a preliminary examination of the importance of housing versus non-housing wealth

accumulation utilizing the *entire* sample (of owners and renters) nevertheless was conducted. The sample was restricted to those households with a head under 50 years of age in order to focus on families that still had strong incentives to save. Because it seems likely that lower-value housing would not appreciate as rapidly as higher value housing, the housing was divided into value quartiles as of 1984, the beginning of the period. The results for this more general sample make two points particularly clearly. First, regardless of value level, there is much less variation in the accumulation of housing wealth than non-housing wealth (coefficients of variation range from 1.634 on high-value housing to 2.552 on low-value housing; alternatively these same measures for non-housing wealth accumulation range between 5.793 and 8.940 respectively). This difference in relative variability is likely a result of the fact that an owner is locked into a kind of "forced savings" through house value appreciation and loan amortization unless they refinance at some point to draw on their equity.

Of particular interest in this additional analysis is the relative importance of housing versus non-housing wealth accumulation across house-value quartiles. For the highest house-value quartile, while housing equity build up is substantial, it is roughly half the average accumulation through non-housing sources (a $56,707 change in housing equity versus a $117,932 change in non-housing wealth during the period). However, when the lowest house-value quartile (with the lowest income owners) was observed the relationship is *reversed*. Specifically the change in housing equity is roughly twice the amount of non-housing wealth accumulation over the period ($10,292 versus $4,970 respectively). Consequently, housing equity accumulation can be viewed as a relatively stable and substantial component of overall wealth accumulation, particularly for lower income families (in lower valued housing). Thus, the results for children and first-time homeownership presented above are consistent with a more "general" sample.

Suggestions for Future Research

Future analysis should focus on modeling wealth accumulation for a more general sample and focusing on differences between various cohorts, i.e., minority households versus majority households, or those households remaining at chronically low-income levels over substantial periods of time versus other income groups. In this context, a number of interesting issues could be addressed. For example, one could consider families at different

life cycle stages and document the differences in this process for those who, in all likelihood, would place a different emphasis on saving. In addition, the analysis presented in this paper does *not* explicitly consider the movement of a household through the hierarchy of housing alternatives. Conceptually, this more sophisticated estimation would be possible with the type of hazard model that has been employed in this analysis. It is easy to imagine that households who move relatively rapidly up the ownership hierarchy would accumulate more wealth than those that do not move as frequently. Also, the ability to make such moves might differ substantially across income groups. Alternatively, some households might return to renting after an initial attempt at home ownership, thus retarding their housing wealth accumulation.

Finally, returning to the primary focus of this paper, the relationship between parental homeownership and children's success needs both further exploration and explanation. While the analysis documents its importance, the exact mechanism by which this benefit is bestowed is not identified. However, nowhere in the literature has there been anything but speculation regarding the nature of this process. One area of exploration which might prove fruitful in understanding the mechanism at work is to compare the differences in the magnitude of this effect across owned-housing with different characteristics, e.g., different public service packages, different neighborhood characteristics, etc. In addition, it could prove insightful to investigate how the dynamics of the parents' movement through the housing hierarchy would impact the children's ultimate success as adults. Such analysis would require a high quality panel data set collected over a long period of time. To our knowledge, the PSID is the only data set available that comes close to having the properties required for such work, and it has its limitations. However, if effective housing policies are to be developed, that are also cost-efficient to implement, the intricacies of the process by which children raised in owner-occupied housing benefit from their environment must be better understood.

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