U.S. Department of Housing and Urban Development
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The Importance of Wealth and Income in the Transition to Homeownership

PD&R

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Prepared for:
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Executive Summary

Homeownership has received great support from policy makers because of its perceived significant financial and social benefits for both individuals and communities. Interested researchers have generated a rich body of research on factors that could help increase homeownership rates, especially among low-income and minority households. Most studies have focused on household income and wealth constraints, although recent work has devoted more attention to household credit risk. These studies have consistently found that downpayment constraints restrict access to homeownership with greater frequency than income. More recent studies employing credit measures have also found that wealth and, to a lesser extent, credit constraints are more important than income constraints in limiting access to homeownership. Most of these studies employ a simulation methodology. Surprisingly, none of the existing studies use longitudinal data to observe how cohorts of households actually transition from renting to owning over a long period of time, how the probability of this transition relates to household income and wealth, and how the relationship between income and wealth and the transition to homeownership may change over time for an individual household. As time passes, changes in household circumstances, market conditions, or government policies and lending practices could influence the role of income and wealth in the probability of transitioning to homeownership.

Our study is the first to examine the probability of becoming a homeowner during a period of 15 years. It uses survival analysis to investigate how the influence of factors that typically affect the transition to homeownership changes over time. It therefore addresses a set of questions that have not yet been addressed in the literature, including: has there been any change in the importance of wealth and income on transition to homeownership over time, and do income and wealth have similar effects on whites and minorities over longer periods? With regard to the first question, there is reason to believe that income and wealth influences may have changed since the 1980s as a result of broader changes in housing and mortgage markets and government policies. With respect to the second question, previous research on racial disparities in homeownership suggests that income and wealth may be more important factors in determining tenure choice for minorities.

The most important contribution of this paper to existing literature is that it used longitudinal data and survival analysis to examine changes over time in the relative importance of income and wealth in predicting homeownership. The study uses the Panel Survey of Income Dynamics (PSID) data to examine the period between 1984 and 1999. As supplementary data on household wealth were only collected in 1984, 1989, 1994, and 1999 in a constant five year span, only those years could be used to investigate the importance of both income and wealth levels of households to their transition to homeownership. The survival analysis follows all renters in the 1984 data who remain as heads of a household in 1989, 1994, and 1999 to see whether and when they achieved the transition to homeownership in each of the five-year periods since 1984.

The findings confirm that both household income and wealth have significant importance to the transition to homeownership. For minorities, wealth is a more important predictor of the transition to homeownership, with significantly higher levels of wealth needed to achieve the same probability of homeownership as white households all else equal. Several explanations for this finding are possible.

Lenders may require higher downpayments by minorities to mitigate other credit risks not captured by these data. Another explanation might be that minority borrowers may have greater aversion to debt and so voluntarily choose larger downpayments. Finally, minorities may be disproportionately concentrated in higher cost markets, which could not be controlled for in the estimated model due to a lack of geographic identifiers in the data.

Some evidence is found to suggest that the importance of wealth in predicting homeownership has declined over time. These results provide some support for the view that the proliferation of mortgage products allowing for low downpayments in the late 1990s may have contributed to a reduction in the importance of wealth for achieving homeownership during the 1994 to 1999 period. But such changes are not significantly more evident among minorities even though wealth was found to be more important for minorities than for whites. These results, however, are somewhat fragile, so further research is needed to support this conclusion.

We also do not find any support for a reduction in the importance of the income, despite the fact that mortgage product innovation has increased the allowable ratios of debt-to-income. However, most existing research has found that wealth constraints have been more important in limiting homeownership than income constraints. Thus, the results of this study may be taken to mean that the relaxation of downpayment has been more important in increasing homeownership opportunities than changes in allowable debt ratios. However, it is possible that relaxed debt-to-income ratios had less impact on the ability to purchase a home and a greater impact on the value of the home purchasers could afford – an impact that was not evaluated in this study.

Introduction

Policy makers have supported homeownership because it is believed to have significant financial and social benefits for both individuals and communities (Rohe et al. 2002). Interest in enhancing opportunities to achieve homeownership have fostered a rich body of research on the impact of borrowing and lending constraints on homeownership, with the former well documented by Rosenthal (2002) and the latter comprehensively summarized by Feldman (2001). While most studies have focused on household income and wealth (e.g. Linneman and Wachter, 1989), recent work has devoted more attention to household credit risk (Rosenthal, 2002 and Barakova et al., 2003). A study by Linneman and Wachter (1989) and subsequent studies employing a methodology similar to theirs have consistently found that downpayment constraints restrict access to homeownership with greater frequency than income. More recent studies employing credit measures, most notably Barakova et al. (2003), have also found that wealth and, to a lesser extent, credit constraints are more important than income constraints in limiting access to homeownership.

The dominant methodology used in this field is simulation, where a regression model of tenure choice is estimated on a cross-sectional sample of renters and owners using measures of income, wealth, or credit constraints as well as demographic variables that are positively correlated with tenure choice. The impact of these constraints is then simulated by re-estimating these models with the constraints relaxed. Surprisingly, few existing studies **take** advantage of longitudinal data to observe how cohorts of households actually transition from renting to owning over time, how the probability of this transition relate to household income and wealth, and how the relationship between income and wealth and the transition to homeownership may change over time for an individual household. Haurin et al. (1997) and Listokin et al. (2001) used longitudinal survey data, (the National Longitudinal Survey of Youth (NLSY) and the Survey of Income and Program Participation (SIPP), respectively) to analyze income and wealth constraints on homeownership. But neither study used the longitudinal nature of these data to analyze how these constraints vary over time. In a recent study sponsored by the U.S. Department of Housing and Urban Development (HUD), Herbert and Tsen (2004) apply survival analysis techniques to longitudinal data from the Survey of Income and Program Participation (SIPP) to examine the probability of renters transitioning to homeownership as a function of income, wealth, and other demographic characteristics and market conditions. However, Herbert and Tsen examine tenure transition over only a three-year period, compared to the fifteen-year period examined by this study. In another recent study sponsored by HUD, Boehm and Schlottmann (2004) use the PSID data to follow up households for eight years (1984 to 1992) and to model the probability of transitioning from renting to owning and vice versa. However, the principal focus of this study is on the impact of tenure choice on wealth accumulation over time and not on the factors associated with tenure choice. As a result, it does not discuss changes in the role of income and wealth in predicting first-time homeownership over time.

As time passes, many factors could influence the probability of transitioning to homeownership. At a macro level, these include mortgage interest rates, underwriting criteria, home price appreciation, appreciation of other household assets, and real rates of income growth relative to house price appreciation. At a micro level, households with different income and wealth could face different obstacles over time, due to either changes in the market or changes in their personal circumstances. Our study is the first to examine the probability of becoming a homeowner over a long period of time

–15 years. It therefore helps to answer a set of different questions that have not yet been addressed in the literature. Specifically, this paper addresses two questions:

- Has there been any change in the importance of wealth and income in predicting the transition to homeownership over time?
- Do income and wealth have similar effects on whites and minorities over longer periods?

With regard to the first question, there is reason to believe that income and wealth influences would have changed since the 1980s as a result of broader changes in housing and mortgage markets and government policies. Specifically, underwriting requirements regarding the maximum allowable ratios of housing expenses and total debt-to-income have been relaxed and there are more low downpayment products available. With respect to the second question, previous research on racial disparities in homeownership suggests that income and wealth constraints may affect minorities more.

Based on the existing literature and our own understanding of market dynamics, we expect our analysis will show the following:

- Low levels of both household income and wealth constrain the transition to homeownership;
- Wealth is expected to be a more important factor in predicting homeownership for minorities both because of the lower levels of wealth held by minorities and because minorities tend to have lower credit scores, which may lead lenders to require larger downpayments to compensate for this additional credit risk[1];
- Wealth should become less important over time as mortgage underwriting requirements regarding loan-to-value ratios have been relaxed;
- Since wealth is more limited among minorities, any reductions over time in the importance of wealth in predicting homeownership should be more pronounced among minorities.

[1] See Bostic, Calem and Wachter (2004) for an analysis of trends in credit score by tenure and race and ethnicity.

Data and Methodology

The study used the Panel Study of Income Dynamics (PSID) data, which are collected by the Survey Research Center at the University of Michigan. The study focuses on survey findings from 1984, 1989, 1994, and 1999 because supplemental surveys in these years gathered information on household net wealth, which includes the value of all assets, including homes, minus all liabilities, including mortgages. This information allows one to analyze how wealth affects a household's ability to achieve homeownership. Survival analysis is used to analyze the role of income and wealth in household transitions from renting to owning over this 15-year period.

More specifically, the analytic method employed is the method of survival analysis described in Singer and Willett (2003). The event of interest is the transition from renting to owning. Following Singer and Willet, we created a multi-period longitudinal dataset, which follows household heads who were renters in 1984 and remained as heads of a household through 1999 and which indicates whether and when their tenure status changes from renting to owning as observed at the end of each five-year period between 1984 to 1999. Hence, households that dissolved (the head did not remain a head of household) are not included. Given the survival analysis approach used, cases are dropped from the sample once a household transitions from renting to owning.

Exhibit 1 summarizes information on the study sample. As shown, there are 1,014 renter households in 1984 in our sample with no change in the household head through 1999. This comprises the initial "risk set" of households with the possibility of experiencing the event of interest– that is, becoming a homeowner. By 1989, 715 households were still renters, while 229 had become homeowners. Of the "surviving" 715 households who were still renters in 1989, 184 achieved homeownership by 1994, while 530 households remained renters, and one household was lost to the survey and so dropped from the analysis ("censored"). By 1999, of the remaining 530 renter households 374 continued to be renters, 114 changed their tenure status from renting to owning, and 42 cases were "censored." Each case where we observe a renter five years later then enters the dataset as a separate observation. In total, the dataset used for analysis consists of 2,216 observations, with 597 cases where renters succeeded in becoming owners.

Exhibit 1. Tenure Status of Sample Over Time

Year	Number of Renting	Number of Becoming Owner	Number of Censored	Number Used In Analysis
1984	1,014			
1989	715	299	0	1,014
1994	530	184	1	714
1999	374	114	42	488
Total		597	43	2,216

Based on our survival analysis dataset, Exhibit 2 displays the share of renter households becoming homeowners in each five-year interval. As shown, the probability of achieving homeownership decreased in each succeeding period. In the initial five-year period, close to 30 percent of renters purchased a home. Among those still renting in 1989, however, less than 26 percent purchased homes by 1994. For those still renting in 1994, the probability of achieving homeownership by 1999 fell further to just above 23 percent. Hence, the likelihood of becoming an owner contingent on not having become one over the prior five-year period declined for each period observed. This pattern of declining transition to homeownership is common when tracking a fixed pool of renters over time. Both Haurin and Rosenthal (2005) and Boehm and Schlottmann (2004) find a similar pattern of declining homeownership transition as renters age beyond age 30 as happens in the time frame observed with this sample.

Exhibit 2. Percentage of Rental Households Achieving Homeownership Since 1984

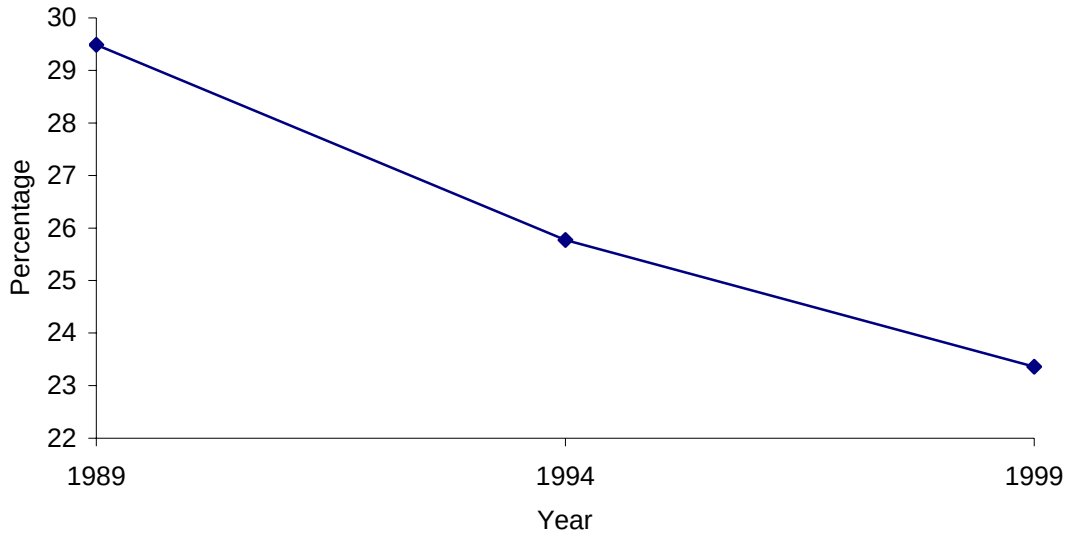
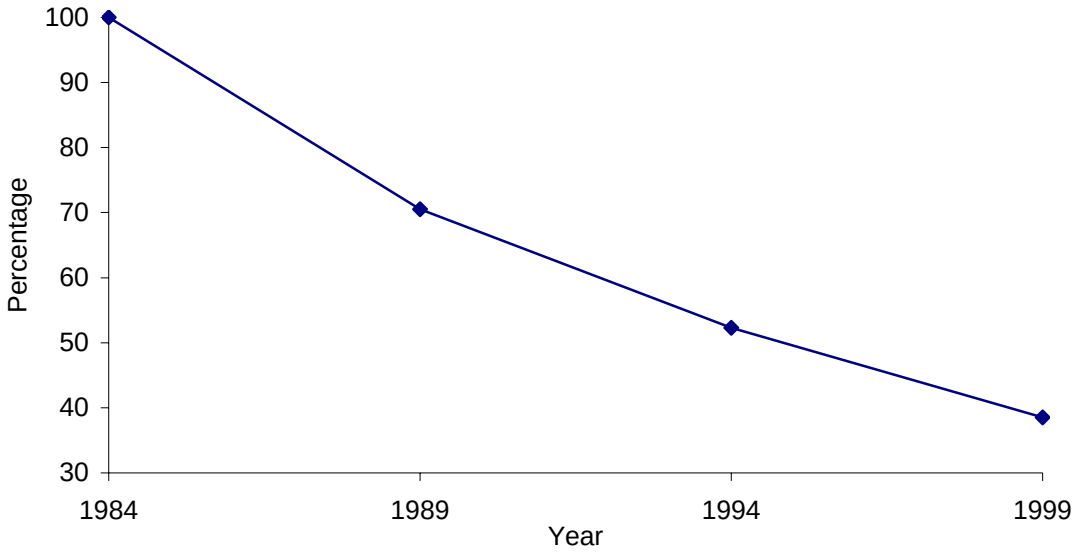


Exhibit 3 presents the sample survivor probabilities for the 1,041 households. The survival probability is the share of renters who continue as renters through succeeding five-year observations. For those who were not homeowners in 1984, nearly 40 percent still remained renters in 1999. Furthermore, Exhibit 3 tells us that a typical 1984 renter household would achieve homeownership about 10 years later (around 1994). That is, about half of the renter households would own their home around 1994 given that the household was a renter in 1984.

In our survival analysis, logistic regression was used to model the probability of achieving homeownership. The dependent variable is housing tenure at the end of each five-year period we observe with a one indicating that the household is an owner and a zero indicating a renter. Income and wealth are our main independent variables, as we want to investigate their importance on homeownership over time. Generally, in survival models time varying covariates are measured as of the beginning of the period. That is, income and wealth at the start of a five-year time period would be used to predict the transition to homeownership over the next five-year period. However, five years is an unusually long period between observations. Investigation of alternative measures of

income and wealth found that much better results were obtained by measuring income and wealth as the average over the five-year period (in constant 2001 dollars), compared to measuring income and wealth at the starting point of the period. This finding is consistent with permanent income theory of consumer behavior. That is, when making decisions about consumer durables households act on the basis of their expectations of future income streams not just current income. In order to account for the fact that there is likely to be a diminishing impact of income and wealth on the probability of homeownership as the values of these variables increase, the log of these variables is used in the model.[2]

Exhibit 3. Survival Probability of Households Remaining Renters Since 1984



Another important focus of this paper is distinguishing the impact of income and wealth on whites and minorities. Unfortunately, there are too few observations for specific racial and ethnic groups to model these groups separately. As a result, all racial minorities and Hispanics are grouped together in a single minority category. As shown in Exhibit 4, among the 1,014 observations in this dataset, about 53 percent are non-Hispanic White while 47 percent are minorities.

Other demographic factors controlled for include the share married or living with a partner (48 percent of the sample), the size of the household, and the share in three age categories as of 1984 (under 30, 30 to 44, and 45 or older). Nearly one-half of the household heads were less than 30 years old in 1984, about one-third were between 30 and 44 years old, and the others were 45 or more years old in 1984.[3] We also include a series of dummy variables indicating the household head's level of education as both a proxy for permanent income and a measure of potential differences in preferences

[2] Since logs are not defined for zero or negative values, cases of zero or negative wealth were recoded as $1 so the log value is zero.

[3] Ideally we would like to include more narrowly defined age categories, such as five-year brackets, but the relatively small sample size required these broader categories.

Exhibit 4: Descriptive Statistics

Variable Name	Description	Means (Std) or Percentage
Age1	Age<30 in 1984	48.82%
Age2	Age in 1984: 30-44	33.14%
Age3	Age>=45 in 1984	18.05%
Minority1	Minority	47.24%
Minority2	White	52.76%
Period1	Period 1984-1989	
Period2	Period 1989-1994	
Period3	Period 1994-1999	
Income	Log of average income during the period	14.75 (1.25)
	(Average income during the period)	$37,501 ($29,941)
Wealth	Log of average wealth during the period	11.01 (6.19)
	(Average wealth during the period)	$50,899 ($259,308)
Family size	Number of persons in household	2.99 (1.73)
Marry0	Unmarried	51.73%
Marry1	Married	48.27%
Edu1	Less than high school	25.49%
Edu2	High school	31.06%
Edu3	Some college	22.53%
Edu4	College or above	20.92%
Region1	South	42.15%
Region2	Northeast	15.5%
Region3	North central	27.02%
Region4	West	15.33%

for homeownership related to income level. Finally, we include dummy variables for the region of the country where the household lived in 1984. While ideally we would like to include more information on the market context in which the tenure choice is made, the public-use PSID does not provide any greater geographic detail.

One point of concern with the estimated model is the long period between observations, as some households may have achieved homeownership during this interval but failed to maintain this status by the end of the period. In this regard the results are best interpreted as predicting transitions to homeownership that are more lasting as failures to maintain homeownership for less than five years may not be observed as transitions to homeownership in our data. Another issue is that some renter households observed in 1984 may actually have been owners before 1984 and were only temporarily renters in 1984. But this situation should not bias the results regarding the importance of income and wealth in predicting the transition to homeownership, as prior owners would likely have higher

income and wealth than renters who have never been owners before. Probably the biggest data limitation is a lack of information on borrower's credit history. Although recent work by Barakova et al. (2003) suggests that credit constraints are less important than wealth constraints in predicting homeownership, it is possible that credit constraints are correlated more with wealth than income since wealth provides a cushion against unexpected events that might damage one's credit. If so, the wealth effect in this study is biased and partially picking up issues related to borrower credit as well. Also, since both credit and wealth requirements have been relaxed by lenders it is possible that any sign of a reduction in the wealth requirement over time may be picking up in whole or in part a reduction in the credit constraint.

As noted in the introduction, the primary goals of the study are to identify whether the importance of income and wealth has changed over time and whether these changes vary between whites and minorities. To test these hypotheses, the estimated model includes a series of interaction terms involving wealth and income. Specifically, we interact income and wealth, respectively, with variables for minority status and the period of observation. Interactions between household income and wealth and minority status enable us to see if the importance of income and wealth are relatively different to minorities and whites. The interaction of both income and wealth with the period of observation allows us to see if the influence of income and wealth has changed over time. Interactions of income and wealth, respectively, with both minority status and the period of observation allow us to test whether changes in the market have been more helpful for minorities in achieving homeownership. Finally, we also include interactions between income and wealth with age to examine whether there are differences in the importance of these variables for different age cohorts.

The general equation for our model can be written as:

$$P = 1 / (1 + \exp(-(\beta_0 + \beta_1 * V_1 + \beta_2 * V_2 + \beta_3 * V_3 + \ldots)))$$

in which P is the probability of achieving homeownership, V_1, V_2, V_3… are the independent predictors of homeownership such as age, income, wealth, education level, or ethnicity, and β_1, β_2, β_3 are the estimated coefficients for each of the corresponding variables. If the model shows that β_1 is significantly different from zero, we can conclude that variable V_1 has effect on predicting the likelihood of becoming a homeowner controlling for the other variables in the model. The anti-Log of β_1 (i.e., $\exp^{\beta_1}$) is the odds ratio for variable V_1, which tells the ratio of the odds of becoming a homeowner versus continuing to be a renter for each unit difference in V_1, with all other variables being held constant.

Findings

Exhibit 5 shows the model results. As expected, household income and wealth are both significant predictors of the transition towards homeownership. This demonstrates the importance of income and wealth to the transition to homeownership. However, minority status and the time period are, by themselves, not statistically significant, although, as discussed more below, certain key interactions of these variables are significant.

First, with regard to the importance of household income, all else equal, the higher the average annual household income over a five-year period the more likely the household will become a homeowner at the end of the period. Using the 1984 to 1989 period as an example**,** Exhibit 6 illustrates the impact of income on the probability of achieving homeownership.[4] Here we estimate the probability of becoming an owner in 1989 assuming a married household with average wealth and of average family size headed by a person that was age 30 to 44 in 1984 and had a high school education. The level of household income is then varied and the probability of owning is estimated separately for whites and minorities assuming other household characteristics are the same. Consistent with the log form of the variable, the importance of income on achieving homeownership is non-linear with larger increases in the probability of homeownership at lower income levels.

Exhibit 6 also illustrates that modeling results indicate there is little difference in the impact of income on achieving homeownership by race. Although the two lines for white and minority are not exactly the same, the difference is trivial and not statistically significant as indicated by the insignificance of the interaction term between minority status and income. Thus, these results suggest that minorities do not experience a more binding income constraint than whites. Everything else equal, minorities with a household income level similar to whites are as likely to become homeowners. However, as will be discussed shortly, this does not mean that there is no racial difference in the propensity to own. Rather, these differences are related to differences in the importance of wealth between whites and minorities.

The results shown earlier in Exhibit 5 also suggest that the importance of income does not differ by the age of the household head or the time period, as none of the interactions between income and these variables is statistically significant. The insignificant interactions with income and time period suggest that changes in the mortgage market during the 1990s did not reduce the influence of the income to achieving homeownership.

[4] Only this period is shown since there is little difference in the graphs for other periods.

Exhibit 5: Model Results

Variable Name	Description	Coefficient
Intercept		-8.531(1.18***)
Age1	Reference group	
Age2		1.544(1.36ns)
Age3		1.552(1.55ns)
Minority1	Reference group	
Minority2		-.507(.99ns)
Period1	Reference group	
Period2		.510(1.36ns)
Period3		-.242(1.51ns)
Income		.280(.08***)
Wealth		.204(.02***)
Income* Age2	Interaction	-.078(.09ns)
Income* Age3	Interaction	-.157(.11ns)
Income*Minority2	Interaction	.102(.06ns)
Income*Period2	Interaction	-.031(.09ns)
Income*Period3	Interaction	.064(.10ns)
Income*Period2*Minority2	Interaction	-.028(.02ns)
Income*Period3*Minority2	Interaction	-.034(.02ns)
Wealth*Age2	Interaction	-.025(.02ns)
Wealth*Age3	Interaction	.034(.03ns)
Wealth*Minority2	Interaction	-.063(.01***)
Wealth*Period2	Interaction	-.005(.02ns)
Wealth*Period3	Interaction	-.053(.02*)
Wealth*Period2*Minority2	Interaction	.033(.02ns)
Wealth*Period3*Minority2	Interaction	.030(.02ns)
Family size		.217(.04***)
Marry0	Reference group	
Marry1		.151(.07*)
Edu1	Reference group	
Edu2		-.153(.09ns)
Edu3		.114(.10ns)
Edu4		.275(.11*)
Region1	Reference group	
Region2		-.319(.11**)
Region3		.081(.10ns)
Region4		-.102(.11ns)
-2LL		1872.74
AIC		1932.74
SC		2103.37
Max-r R-Square		.3824
R-Square		.2630
DF		29

Note: *** p<.001, ** p<.01, * p<.05, and standard errors are in parentheses.

Exhibit 6. The Probability of 1984 Renters to Achieve Homeownership by 1989 as a Function of Income and Minority Status
(Average Wealth & Family Size, Married, High School Education, South)

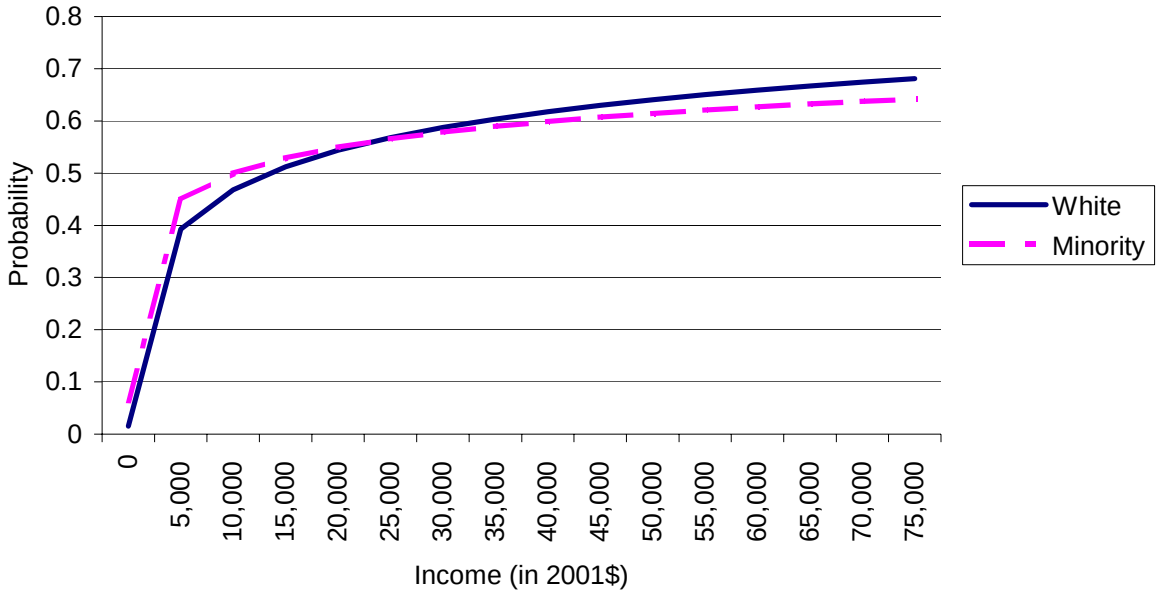
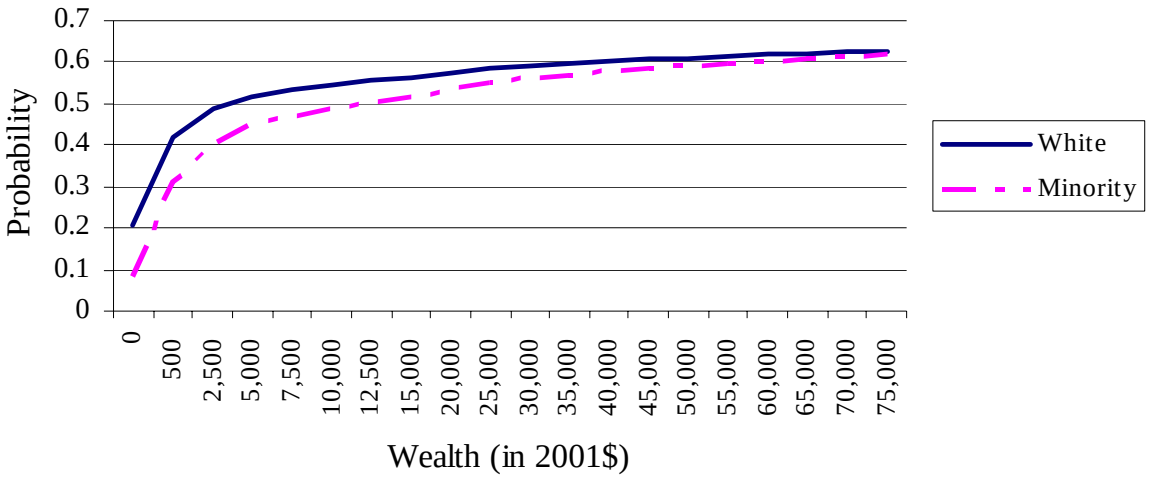


Exhibit 7 illustrates the impact of household wealth on the probability of achieving homeownership assuming the same household characteristics as described above for Exhibit 6. Again, consistent with the log form, the importance of wealth on achieving homeownership is also non-linear—there are larger increases in the probability of ownership for increases in wealth at the low end than is true for increases at the high end. For white households, the average probability of achieving homeownership by 1989, given that the household was a renter in 1984 is 42 percent assuming average wealth during this period of $500 and 51.6 percent if the average wealth of $5,000. If the average wealth increases by $5,000 to $10,000, the probability increases to 54.5 percent, merely a 2.9 percentage point increase for a $5,000 difference in wealth. While higher wealth levels continue to increase the probability of achieving homeownership, the effect is smaller than at lower levels of wealth. For example, a $5,000 increase in wealth from $20,000 to $25,000 only increases the probability of homeownership by 0.9 percentage points from 57.3 to 58.2 percent. This result is consistent with the finding by Herbert and Tsen (2004) that small amounts of wealth are associated with large increases in the probability of homeownership and that increases in wealth above these low levels increases the probability of homeownership by relatively small amounts.

Exhibit 7. The Probability of 1984 Renters to Achieve Homeownership by 1989 As a Function of Wealth and Minority Status
(Average Income & Family Size, Married, High School Education, South)



The significant negative coefficient on the interaction term between minority status and wealth indicates that minorities require higher levels of wealth to achieve the same probability of homeownership as whites. As shown in Exhibit 7, all else being equal, at all levels of wealth minorities are less likely to achieve homeownership than whites. For example, assuming the household characteristics described previously, with $5,000 in wealth the probability of achieving homeownership is 44.6 percent for minorities and 51.6 for whites, a 7-percentage point difference. To put it in another way, a minority renter in 1984 would have to have more than $12,500 in average wealth during the period to have a similar probability of homeownership as whites with $5,000 in wealth. However, as also illustrated by Exhibit 7, racial differences in the impact of wealth on the probability of homeownership decline as wealth increases.

We can only speculate as to why minorities, which as defined for this study includes blacks, Hispanics, Asians, and other racial groups, require more wealth to become owners. One hypothesis is that lenders require greater equity contributions by minorities to accommodate for higher levels of credit risk – either perceived or actual. To the extent wealth is needed to compensate for credit, borrowers are credit constrained, not wealth constrained. However, since our data set does not include measures of borrower credit history, we cannot control for this factor. It could also be that minorities prefer to purchase homes with larger equity investments to lower their reliance on debt. Another possible reason is that minorities are disproportionately concentrated in higher cost areas where required dollar downpayments are larger by virtue of higher cost homes. Unfortunately, the lack of geographic identifiers in the PSID data used for this study precluded the use of any controls for variations in market conditions across borrowers.

The modeling results also suggest that the influence of wealth decreased in the late 1990s as indicated by the significant negative interaction term between wealth and the 1999 period variable.[5] This is in keeping with expectations since lending practice in the late 1990s became more relaxed regarding downpayment requirements, with the advent of mortgage products allowing downpayments as low as 3 percent of the purchase price. Not only are these products widely available, homebuyers used them increasingly over the time period studied. According to data provided by the Federal Housing Finance Board, the share of home purchase loans with downpayments of 10 percent or less increased from 10 percent in 1989-91 to 25 percent by 1994-97.[6] However, this finding of a reduction in how binding the wealth influence has been is not robust. Other variations of the model tested but not reported here which contained different interaction terms resulted in insignificant coefficients on this variable.

The three-way interactions of wealth with both minority status and period were not statistically significant. Thus, even though we find significant differences between whites and minorities in the importance of wealth in predicting homeownership, we do not find any evidence that there has been a differential change in the importance of wealth over time between whites and minorities. This suggests that changes over time did not just benefit minorities alone; rather, whites and minorities benefited equally.

Although household age is usually strongly associated with homeownership, our model does not produce statistically significant coefficients for the age variables or their interactions with household income and wealth. To some extent, this is not surprising given the longitudinal nature of our data structure. Over such a long period of time the impact of age will be diminished.

Other variables that were statistically significant are family size, marital status, and having a college education, which were positively associated with the probability of homeownership, and residence in the Northeast region, which was negatively associated with homeownership. These results are all in keeping with expectations. Married couples with children and those with higher education levels generally have higher homeownership rates. The Northeast region has relatively high home prices and has less single family housing than other regions, which may make homeownership more difficult to achieve compared to other regions (Herbert, 1997).

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[5] The interaction term between wealth and the period 1989 to 1994 (period 2) is very small and not significant, indicating that the baseline coefficient on wealth of 0.204 is unchanged in this period. However, the coefficient on the interaction term for 1994 to 1999 (period 3) is significant and negative. This indicates that the effect of wealth was reduced by 0.053 in this later period, yielding a coefficient of 0,151 in the late 1990s.

[6] Figures cited in HUD's Proposed Housing Goals for Fannie Mae and Freddie Mac (Federal Register, May 3, 2004, page 24275.

Conclusion

The results of the survival analysis of the transition from renting to owning based on the linked longitudinal data of the PSID from 1984, 1989, 1994, and 1999 finds that both household income and net wealth are positively related to the likelihood of achieving homeownership while controlling for other demographic factors. Although modeling results do not find any difference in the propensity to own generally between whites and minorities, they do suggest that the required wealth level for minority transition to homeownership is higher. Several explanations for this finding are possible. Lenders may require higher downpayments by minorities to mitigate other credit risks not captured by these data. Another explanation might be that minority borrowers may have greater aversion to debt and so voluntarily choose larger downpayments. Finally, minorities may be disproportionately concentrated in higher cost markets, which could not be controlled for in the estimated model due to a lack of geographic identifiers in the data. The model results also support the view that the proliferation of mortgage products allowing for low downpayments in the late 1990s may have contributed to a reduction in the importance of wealth for achieving homeownership during the 1994 to 1999 period. These results, however, are somewhat fragile, so further research is needed to support this conclusion.

We also do not find any support for a reduction in the importance of the income, despite the fact that mortgage product innovation has increased the allowable ratios of debt-to-income. However, most existing research has found that wealth constraints have been more important in limiting homeownership than income constraints. Thus, the results of this study may be taken to mean that the relaxation of downpayment has been more important in increasing homeownership opportunities than changes in allowable debt ratios. However, it is possible that relaxed debt-to-income ratios had less impact on the ability to purchase a home and a greater impact on the value of the home purchasers could afford – an impact that was not evaluated in this study.

One of the contributions of this study is the use of a longitudinal data set to investigate the change over time in the importance of income and wealth on homeownership. Our model results are based on data of actual observations following more than a thousand household heads from 1984 to 1999. In contrast, the existing literature largely employs a simulation methodology on a cross section of data from one point in time. Our results both reinforce the existing literature and strengthen the current understanding the role of income and wealth in the transition toward homeownership.

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