October 1989

The Impacts of Borrowing Constraints on Homeownership

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Abstract
This paper utilizes micro data to directly quantify the impact of mortgage underwriting criteria on individual homeownership propensities. To determine whether a family is constrained by these criteria, the optimal home purchase price is estimated. The results indicate that wealth and income constraints both reduce homeownership propensities, with a stronger impact for wealth constraints. Mortgage market innovations of the early 1980s seem to have reduced these effects. The research indicates, however, that even in well-developed capital markets, the presence of borrowing constraints adversely affects homeownership propensities.

AREUEA Journal, Vol. 17, No. 4, 1989

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INTRODUCTION

Analysts of housing policy have long recognized that access to mortgage funds may affect the homeownership decision. For example, many microdata studies of homeownership propensities interpret the strong positive correlation between family income and the probability of homeownership as partially reflecting the greater ability of relatively high-income families to secure adequate mortgage financing. In a similar vein, the National Association of Realtors' index of housing affordability is widely cited as a barometer of the ability of families to adequately finance and hence to purchase their homes. Finally, a number of macro studies of the housing market have included measures of the availability of mortgage funds in an attempt to identify the linkage between mortgage fund availability and homeownership.[1] However,

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Date Received: August 1988; Revised: July 1989.
[1]See, for example, Hendershott [7], Jaffe and Rosen [11].

no direct parameterization of the impacts of borrowing constraints on the homeownership decision exist.

In this paper we utilize microdata to directly quantify the impacts of mortgage underwriting criteria on individual homeownership propensities. In particular, we focus on the income and wealth requirements for mortgages that qualify for purchase by the Federal Home Loan Mortgage Corporation and the Federal National Mortgage Association. While we recognize that these criteria are not legally binding or relevant for all mortgages, with the growth of secondary mortgage securities, these criteria have become industry standards. As such, these mortgage qualifying requirements provide a reasonable baseline for calculating the extent to which a family is constrained in its mortgage borrowing.

In the next section we develop measures of the degree to which a family is constrained by mortgage underwriting criteria with respect to both family income and wealth. In the following section we incorporate these measures of borrowing constraints directly into an empirical analysis of individual homeownership propensities. We examine the tenure decisions for a sample of families that changed their residences between 1975 and 1977, as well as a sample that changed their residences between 1981 and 1983.[2] By considering these two sample periods we not only enhance the power of our results, but also indirectly observe the influence of mortgage market innovations, such as adjustable-rate mortgages and growing secondary mortgage markets, on the impact of mortgage borrowing constraints on the homeownership decision.

We find that significantly wealth-constrained families were much less likely to choose homeownership, though this adverse impact was more severe in the 1975-1977 period than in the later sample period. We find a weaker adverse impact on homeownership from being constrained by the income-borrowing criteria. Moreover, this adverse income constraint effect was largely eliminated by the 1981-1983 period. The paper concludes with a brief summary.

BORROWING CONSTRAINT MEASUREMENT

The size of a mortgage loan (M) can be expressed as the product of the loan-to-value ratio (L) and the purchase price of the home (V),

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[2]Sample selection bias may exist if, for example, people who are constrained by borrowing criteria decide not to move. Underestimates of the impact of the borrowing constraints would result in this case.

$$M = LV. \tag{1}$$

Ignoring amortization, annual mortgage payments (P) for a loan are equal to the annual mortgage interest rate (r) times the size of the loan,

$$P = rM. \tag{2}$$

Two key underwriting mortgage criteria are that the loan-to-value ratio be less than or equal to 0.8,

$$L \leq 0.8, \tag{3}$$

and that annual mortgage payments be less than or equal to 28% of the borrower's annual family income (I),

$$P \leq 0.28I. \tag{4}$$

Of course, the maximum allowable loan by these criteria occurs when both (3) and (4) hold as equalities. Combining (1) and (2) and substituting both (3) and (4) as equalities into these equations allows us to express the maximum home purchase price (V^I) that is consistent with borrowing criteria (3) and (4),

$$V^I = \frac{.28I}{.8r} = .35\frac{I}{r}. \tag{5}$$

Thus, knowledge of an individual's family income and the prevailing mortgage interest rate allows us to identify the maximum home purchase price for which the individual can qualify for a full mortgage in terms of what we refer to as the income-borrowing criteria.

Similarly, underwriting mortgage requirements state that a borrower's net wealth (W) should be greater than or equal to his/her downpayment (D) on the home,

$$W \geq D. \tag{6}$$

Assuming the potential borrower seeks the maximum possible loan, (3) and (6) together imply that the maximum home purchase price that satisfies the underwriting wealth criteria (V^W) is five times net wealth,

$$V^W = 5W. \tag{7}$$

Thus, knowledge of a family's net wealth allows us to calculate the maximum purchase price for which it can qualify.

Independent of these mortgage qualifications, a family must decide what level of housing services it desires to purchase. The capitalized value of this target level of housing service flow is designated as V^*,

and is a function of the family's income and a vector of preference variables (X),[3,4]

$$V^* = V(I, X; b), \tag{8}$$

where b is a vector of parameters.

Before turning to the measurement of V^*, note that if the capitalized value of a family's optimal service flow exceeds the maximum purchase price that satisfies the income criteria (equation (5)), the family's mortgage opportunity set is constrained by the income criteria. Similarly, if V^* exceeds the maximum purchase price allowable under the wealth criteria (equation (7)), the family's mortgage opportunities are constrained by the wealth criteria.

In order to determine whether a family is constrained by either the income or wealth mortgage criteria, we need to estimate V^*. Because a family facing a borrowing constraint may choose to purchase a home providing less than optimal services (at a price less than V^*), we cannot use observed purchase prices for all homeowners to estimate V^*. In a similar vein, for families facing a borrowing constraint choosing to rent rather than own, no purchase price is observable. However, for families who choose to own homes with purchase prices substantially below their V^I and V^W values, it is reasonable to believe that observed purchase prices are (on average) equal to the capitalized value of their optimal service flows. Consider, for example, the case of an extremely wealthy family that can qualify for a $30 million loan but only purchases a $1 million home. It is reasonable to infer that this family purchased its home without consideration of the loan-qualifying criteria. Of course, similar remarks apply to lesser-income families purchasing homes at prices substantially less than both V^I and V^W.

We categorize families that have observed home purchase prices less than 85% of both V^I and V^W as families that are unconstrained in terms of both income and wealth criteria. This unconstrained sample of homeowners, for whom the observed V equals V^*, is then used to estimate the optimal home purchase price equation,

$$V^*[\text{for } V \leq \min(V^I, V^W)] = V(I, X; \hat{b}) + e \tag{9}$$

where $\hat{b}$ is the estimated parameter vector and e is a vector of errors. Equation (9) can then be applied to the income and X vector for each family in order to obtain its predicted optimal home purchase price ($\hat{V}^*$),

$$\hat{V}^* = V(I, X; \hat{b}). \tag{10}$$

[3]See Linneman and Voith [15] for a detailed discussion of the capitalization rate for converting service flows to purchase price for owner-occupants.

[4]For a discussion of the literature on housing service flow demand see, for example, Linneman [12].

If the predicted optimal home purchase price is 100% or more of V^I, we categorize the family as highly income constrained ($HIGH^I = 1$). If the family has a predicted optimal home purchase price between 90% and 100% of V^I, we categorize the family as moderately income constrained ($MOD^I = 1$). In an analogous fashion, we categorize a family as highly wealth constrained if $\hat{V}^*$ is 100% or more of V^W ($HIGH^W = 1$) and moderately wealth constrained if $\hat{V}^*$ is between 90% and 100% of V^W ($MOD^W = 1$). Finally, we use the difference between $\hat{V}^*$ and V^I for highly income-constrained families to measure the extent to which these families have their mortgage opportunities restricted by the income criteria,

$$GAP^I \equiv HIGH^I(\hat{V}^* - V^I). \tag{11}$$

In a similar manner, we use the gap between $\hat{V}^*$ and V^W for highly wealth-constrained families to measure the degree to which these families are constrained by the wealth criteria,

$$GAP^W = HIGH^W(\hat{V}^* - V^W). \tag{12}$$

These direct measures of the presence of binding borrowing constraints can be incorporated into an otherwise traditional microdata analysis of the probability of homeownership.[5] Specifically, we utilize a logistic specification of the probability of homeownership as a function of family income, the relative cost of ownership versus renting (C), a vector of control variables (Z), and the borrowing constraints,

$$\text{Prob}(OWN = 1) = P(I, C, Z, HIGH^I, MOD^I, GAP^I, HIGH^W, MOD^W, GAP^W). \tag{13}$$

We expect that, other things constant, highly borrowing-constrained families should be less likely to choose homeownership. Further, we anticipate that the greater is the extent of these borrowing constraints, the less likely is the propensity to own. We also expect that the importance of the income-borrowing constraint should diminish in the presence of adjustable-rate mortgages (ARMs), as ARMs represent a route by which the decisionmaker circumvents the income criteria for fixed-rate mortgages. Finally, we expect that the estimated impacts of income and the other control variables on the homeownership probability should decline when the borrowing constraint variables are included in the empirical analysis because we suspect some of the empirical importance of these control variables in traditional analyses reflect correlations with the usually omitted borrowing constraint variables.

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[5]See Linneman [13, 14] for a discussion of the traditional homeownership specification. Typical explanatory variables include family income, user cost, life cycle variables, and demographic characteristics of the decisionmaker.

EMPIRICAL RESULTS

We use the Federal Reserve Board's 1977 *Survey of Consumer Credit* and 1983 *Survey of Consumer Finances* to parameterize the probability of homeownership. In order to focus our attention on families making marginal decisions with respect to tenure status, we restrict our sample for the 1977 survey to households that changed their residence during the thirty-six months prior to the 1977 survey. This yielded a sample of 735 households who moved between 1975 and 1977 and provided usable responses for the variables used in our analysis. In a similar manner, we restricted our analysis of the 1983 survey to those families who moved between 1981 and 1983. The 1983 survey provided 511 observations. These data provide information on tenure status, how long the family has lived in its current residence, net wealth, and a host of socioeconomic characteristics.

By using these two distinct periods, we are able to enhance the power of the study. Further, ARMs were largely nonexistent in the earlier sample period while by the latter period they were commonly offered. Thus, we expect the income-borrowing constraint to exert a smaller impact on tenure choice in the latter period because of the availability of financing alternatives other than fixed-rate mortgages. Also, the increased use of seller financing and other non-traditional financing sources in the 1981-1983 period is expected to diminish the impacts of both the income and wealth constraints on the homeownership decision.

Table 1 displays the sample means for both time periods. All dollar

TABLE 1

Sample Means

	1975-1977	1981-1983
Owner Occupied	49.5%	35.2%
Family Income (Constant 1977 $)	14,306	15,362
Permanent Income	14,833	25,648
Relative Homeownership Cost	0.69	1.61
Head Age Under 25	23.7%	20.0%
Head Age 25-29	25.7%	23.4%
Head Age 30-34	17.4%	17.2%
Head Age 35-44	13.2%	20.2%
Head Age 45-54	9.7%	8.8%
Head Age 55-64	6.3%	5.9%
Head Age 65-74	2.9%	3.5%
Head Age Over 74	1.3%	1.2%
Black Head	8.0%	6.1%
Hispanic Head	2.9%	2.9%
Married	66.2%	56.6%
Family Size	2.7	2.5
Expected Tenancy Time	10.7	10.5
Observations	735	511

amounts are expressed in 1977 dollars. In both periods the probability of homeownership among recent movers is below 50%. This partially reflects the relatively young head age distributions of these samples.[6] It also reflects the fact that the marginal homeownership propensity was less than the average propensity during these periods, as is reflected in the declining homeownership proportion in the U.S. in the early 1980s compared to the 1970s.[7]

The relative ownership cost variable measures the user cost of homeownership relative to renting. For each individual we calculate the constant-quality user cost of homeownership definition developed by Hendershott and Shilling [8] and first applied using these data by Shear, Wachter and Weicher [16], and divide this cost by the constant-quality rental cost in the city in which the family lived during the year the family made its tenure decision.[8] It is noteworthy that the relative cost of homeownership rose by approximately 150% between the early period and the 1981-1983 period. This reflects declining real rents, rising home purchase prices, and rising interest rates.

Another socioeconomic factor leading to a reduced mean homeownership propensity in the latter period is the substantial decline (near 10 percentage points) in the proportion of families that are married. A countervailing factor is that real family income rose by approximately 7% between the two sample periods. The expected tenancy time reflects the number of years the family is estimated to reside in its home at the time it is making its tenure decision. This variable is measured using the expected tenancy prediction equation developed in Linneman [14].[9]

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[6]The median head age in both sample periods is approximately 32 years.

[7]The *Annual Housing Survey* shows a decline of approximately one percentage point from 1980 to 1983, with a far larger decline among young households. Similar though larger declines are shown in our data sets. See Shear, Wachter and Weicher [16].

[8]The formula for the cost of homeownership, taken from Hendershott and Shilling [8], is:

$$R = ((1 - t_y)i - q - gd + (1 - t_y)t_p)P$$

where R is the implicit rent of a house, P is its price, i is the mortgage rate, q is the house price inflation rate, d the depreciation rate on the structure (assumed to be .017 per year), g the structure/land ratio (assumed to be .83), t_y the marginal income tax rate and t_p the property tax rate. The ratio of the cost of homeownership to the rent for a constant-quality rental apartment is the relative homeownership cost variable. Four variables used to construct this cost vary geographically among the households in each survey: the price of a constant quality house, the property tax rate, the appreciation rate, and the rent for a constant-quality rental apartment. For details on the calculation of these, see Shear, Wachter and Weicher [16].

[9]Alternatively the expected tenancy effect can be incorporated into the user cost (see Haurin, Hendershott and Ling [6]).

TABLE 2

Borrowing Constraint Means

	1975-1977	1981-1983
$High^I = 1$	15.5%	26.8%
$MOD^I = 1$	3.4%	6.1%
GAP^I given $HIGH^I = 1$	$11,127	$16,008
$HIGH^I = 0$ anc $MOD^I = 0$	81.1%	67.1%
$HIGH^W = 1$	45.2%	40.1%
$MOD^W = 1$	1.4%	0.6%
GAP^W given $HIGH^W = 1$	$21,962	$33,055
$HIGH^W = 0$ and $MOD^W = 0$	53.4%	59.3%

In order to calculate the maximum home purchase price that a family could qualify for in terms of the income criteria, we estimated V^I using equation (5), with the Federal Home Loan Bank Board thirty-year fixed-rate mortgage rate in the month the family made its tenure choice used to calculate the relevant mortgage constant. V^W was calculated for each family via equation (7), based upon the family's estimated wealth at the time it made its tenure choice.[10]

In order to calculate V^*, we utilize the methodology described in the last section to estimate the optimal home purchase price (equation (9)) for unconstrained owners as a function of a set of socioeconomic traits and the constant quality user cost of homeownership. The parameters for these estimating equations were as expected, and are presented in Appendix 1. These parameter estimates are then applied to all observations via equation (10) to estimate $\hat{V}^*$ for each family.

The borrowing constraint definitions developed in the last section are obtained by comparing $\hat{V}^*$ to V^I and V^W for each family. Table 2 presents a summary of the presence of the borrowing constraints for both sample periods. In the 1981-1983 period somewhat less than twice as many households were highly income constrained than were in the earlier period. This reflects the fact that mortgage interest rates rose more rapidly between these periods than did family income. However, the growth in real wealth between these two periods, fueled by the appreciation in homes already owned and a bullish stock market (see Weicher and Wachter [17]), caused a small decline in the proportion of families that faced a high wealth constraint.

In both survey periods, a substantially greater number of families faced a highly binding wealth constraint than faced a highly binding

[10]Net wealth includes respondents' estimated value of financial assets, equity (if owner), other real estate and unincorporated business asset minus mortgage debt. See, for a full discussion of the data source, Shear, Wachter and Weicher [16].

TABLE 3

Mean Partial Impacts on Homeownership Probabilities

	1975-1977	1975-1977	1981-1983	1981-1983
Permanent Income (per $1,000)	0.017[c]	0.001	0.010[c]	0.005[b]
Relative Homeownership Cost	−0.075	−0.091	−0.055	−0.201[c]
Head Age Under 25	−0.777[c]	−0.418	−0.712[c]	−0.389[c]
Head Age 25-29	−0.721[c]	−0.258	−0.729[c]	−0.342[b]
Head Age 30-34	−0.655[c]	−0.239	−0.611[c]	−0.296[b]
Head Age 35-44	−0.573[c]	−0.220	−0.628[c]	−0.306[b]
Head Age 45-54	−0.442[c]	−0.043	−0.416[c]	−0.184
Head Age 55-64	−0.349[b]	−0.123	−0.389[c]	−0.230[b]
Head Age 65-74	−0.061	−0.060	−0.214	−0.097
Black Head	−0.146	−0.058	−0.215[b]	−0.020
Hispanic Head	−0.163	−0.207	−0.193	0.033
Married	0.184[c]	0.232[c]	0.127[a]	0.128[a]
Family Size	0.056[c]	0.087[c]	0.047[b]	0.020
Expected Duration of Tenancy	0.051[c]	−0.019	−0.052[c]	0.003
$HIGH^I = 1$		−0.316[c]		−0.191[b]
$MOD^I = 1$		−0.234[c]		−0.099
GAP^I (per $1000)		−0.0002		−0.005
$HIGH^W = 1$		−0.610[c]		−0.209[b]
$MOD^W = 1$		−0.356[c]		−0.173
GAP^W (per $1000)		0.0004		−0.009[c]
$-2X\ lnL$	786.91	579.94	469.34	327.44

[a]significant at 10% level
[b]significant at 10% level
[c]significant at 10% level

income constraint. For example, in the 1981-1983 sample period nearly one and a half times as many families were highly wealth constrained as were highly income constrained. Similarly, the average gap among highly wealth-constrained families was much greater than the average gap among highly income-constrained families. It is also noteworthy that not only were more families facing a binding income constraint in the 1981-1983 period than in the 1975-1977 period, but also both the average gap between $\hat{V}^*$ and V^I and between $\hat{V}^*$ and V^W were considerably lower in the 1981-1983 period.

A logistic specification of the probability of homeownership (equation (13)) was estimated for both sample periods. Table 3 reports the estimated partial impacts for each variable.[11] The first column for each

[11]For the continuous independent variables, Table 3 displays the mean partial derivative of the homeownership propensity with respect to the variable. For the discrete value independent variables, Table 3 reports the differential between the probability evaluated when the variable equals one rather than zero, with all other variables set at their mean values. Complete logit parameters are reported in Appendix 2.

sample period excludes the borrowing constraint variables in order to provide a basis of comparison with traditional homeownership specifications. As expected, these baseline results indicate that the probability of homeownership rises with both family income[12] and family size, and that married households are substantially more likely to own than their single counterparts. Ownership propensities also tend to rise with the age of the head for both sample periods.

Turning to the impacts of the borrowing constraints, the fit for both sample periods increased notably as the result of including these variables in the analysis. Further, as expected, both the magnitudes and precision of the estimated impacts of family income and age of the head diminish in both periods when the borrowing constraints are incorporated. Similarly, in the 1981-1983 sample period, the impacts of race and marital status on homeownership diminish when the borrowing constraints are added. This reflects the fact that in traditional homeownership specifications these variables partially reflect the impact of borrowing constraints.

In the 1975-77 sample period the probability of homeownership (among otherwise identical families) was 32% lower among highly income-constrained families than among unconstrained families. However, this negative impact was not significantly related to GAP^I. Moderately income-constrained families were also significantly affected by this constraint. In a similar vein, highly wealth-constrained families were 61% less likely to choose homeownership than otherwise identical families in the 1975-1977 period. This impact was not significantly related to GAP^W. Also, the results indicate that moderately wealth-constrained consumers were less (more) likely to own than unconstrained (highly wealth-constrained) consumers, and this impact is significantly different from zero at conventional significance levels.

In the 1981-1983 period the estimated adverse impacts of borrowing constraints on homeownership are smaller than in the earlier period. For example, highly income-constrained families are only 19% less likely to choose homeownership, while a highly wealth-constrained family is only 21% (versus 61% in 1975-1977) less likely to own in the 1981-1983 period when compared to otherwise identical, but unconstrained, households. It is noteworthy, however, that while homeownership remains insignificantly related to GAP^I in the 1981-

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[12]Permanent income is used in the probability of homeownership and optimal home purchase price equations. Permanent income is constructed in a procedure used by Follain [3] and Goodman and Kawai [5]. For a discussion of the procedure and data used, see Shear, Wachter and Weicher [16]. Because mortgage lenders and secondary market underwriters base their lending decision on current family income, this measure of income is used in the construction of the income constraint variable.

1983 sample, the probability of homeownership declines significantly with GAP^W in 1981-1983.

We also examined an alternative version of the constraints in which a 10% downpayment was used and mortgage payments were augmented by 3% of maximum house value as an approximation of the combined payment for property taxes and hazard insurance. There was no change in the sign or significance of coefficients (available from the authors) except in the percentage of those facing a highly binding wealth constraint, which under this formulation equals 31.7% in 1975-1977 and 17.2% in 1981-1983, and a highly binding income constraint, which under this formulation equals 20.8% in 1975-1977 and 10% in 1981-1983. The diminished importance of the income-borrowing constraint found in the 1981-1983 sample suggests that ARMs combined with seller financing and other financing innovations[13] allowed most income-constrained families (in terms of a fixed-rate mortgage) to avoid the adverse impacts. For example, if the fixed-rate mortgage borrowing rate is 10% while that for an ARM or a seller financing contract is 8%, a family with a $20,000 family income can finance an additional $17,500 in home purchase price.[14] Because the average GAP^I for highly income-constrained families was approximately $16,000 in 1981-1983, while the differential between fixed rates and initial rates on adjustable rates was usually in excess of 200 basis points during this period (including teaser rates), it is not surprising that the income constraint had little impact on homeownership propensities in this period.

It should be noted that in both sample periods, the adverse impact of being highly wealth constrained on homeownership is greater than is the impact of being highly income constrained. This result is intuitively appealing, as it suggests that if a family cannot come up with the minimum required downpayment on a home it deems worth owning, then its most viable alternative is to rent until it can afford a sufficient downpayment. In contrast, if it has sufficient wealth to provide the downpayment on the "home of its dreams" but does not have a high enough income to satisfy the income criteria for that home, it has the added alternative of reducing the loan-to-value ratio below 80% by using its wealth to increase its downpayment until it satisfies the income criteria.

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[13]The degree to which this decline in restriction is due to the introduction of ARMs as opposed to the use of seller financing is not known.

[14]Via (5), V^I at $r = .08$ is $V^I = .35\left(\frac{20000}{.08}\right) = \$87{,}500$ while for $r = .10$, $V^I = .35\left(\frac{2000}{.10}\right) = \$70{,}000$, for an $17,500 difference.

The reduced impact of being wealth constrained in 1981-1983 appears to reflect the fact that the financing innovations of that period (for example, owner financing), provide imperfect, but effective, substitutes to the net wealth of the borrower. Taken together, our results suggest that residential mortgage markets were less restrictive in terms of the homeownership in recent years than has historically been true. However, even in the relatively well-developed mortgage markets of 1981-1983, homeownership decisions were not made independently of mortgage financing availability. Our findings should not be interpreted that the Federal Home Loan Mortgage Corporation and Federal National Mortgage Association mortgage underwriting criteria are irrational or inefficient. Rather, our results quantify their impacts and indicate that if these constraints are triggered by external events (such as abrupt net wealth declines, inflation-induced shifts in the yield curve, or cyclically induced downturns in real incomes), these mechanical constraints will cause significant changes in homeownership propensities.

SUMMARY

In this paper, we expand the traditional empirical analysis of homeownership to incorporate explicit measures of the presence of binding borrowing constraints. Our empirical results indicate that the presence of both income and wealth constraints reduce homeownership propensities. This is particularly true with respect to the wealth constraint. However, our results indicate that mortgage market innovations have reduced these effects over time. It remains an unanswered question which of these innovations are most responsible. In sum, we conclude that even in well-developed capital markets, the presence of borrowing constraints adversely affects the homeownership propensities.

We wish to thank Don Haurin, Patric Hendershott and anonymous referees for helpful comments on an earlier draft. We also thank Woo Hyung Yang for exceptional research assistance.

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APPENDIX 1

Optimal Home Purchase Price Equation

Name of Variable	Coefficient of Variable 1977	1983
Intercept	−6778.977	−16701.583
Age of Head	305.175	2389.540
Age of Head Squared	−3.914	−20.104
Permanent Income	0.648	1.423[c]
Permanent Income Squared	-1.6781×10^{-5}[a]	-2.345×10^{-5}[b]
Relative Homeownership Cost	−6.453[c]	−10.209[c]
Marital Status of Head		
Married	−1167.835	−24144.391[a]
Others (Reference Group)		

APPENDIX 1 continued

Number of Children (under 18)	1669.693[b]	−1306.848
Sex of Head		
Male (Reference Group)	774.292	11310.700
Race of Head		
White or Other Minorities	9877.150[c]	−3392.854
Hispanic	12171.845[a]	27221.956
Black (Reference Group)		
Region of Country		
Northeast	11458.046[c]	22948.755[c]
North-Central	6349.279[c]	13293.634[a]
West	7595.521[c]	8694.689
South (Reference Group)		
Belt Code		
Central Cities of the 12 Largest SMSAS	2884.890	−25180.948
Central Cities of the other SMSAS	11011.716[c]	9149.126
Suburbs of the 12 largest SMSAS	13779.750[c]	8575.320
Suburbs of the other SMSAS	6816.754[b]	17222.736[a]
Areas of SMSAS outside of both Central Cities and Suburbs	3141.446	11405.733
Rural Areas ((Non SMSAS) Reference Group		

[a]significant at 10% level
[b]significant at 5% level
[c]significant at 1% level

APPENDIX 2

Parameter Values of Homeownership Logit Regression

	1977	1977	1983	1983
Permanent Income (per $1,000)	0.068[c]	0.003	0.044[c]	0.033[b]
Relative Homeownership Cost	−0.300	−0.365	−0.244	−1.222[c]
Head Age Under 25	−5.697[c]	−1.965	−7.942[c]	−4.585[c]
Head Age 25-29	−4.479[c]	−1.096	−7.137[c]	−3.303[b]
Head Age 30-34	−4.464[c]	−1.028	−6.585[c]	−3.230[b]
Head Age 35-44	−3.662[c]	−0.947	−6.032[c]	−3.083[b]
Head Age 45-54	−2.315[c]	−0.176	−4.287[c]	−1.758
Head Age 55-64	−1.661[b]	−0.509	−4.364[c]	−3.318[b]
Head Age 65-74	−0.244	−0.244	−1.242	−0.728
Black Head	−0.600	−0.237	−1.219[b]	−0.123
Hispanic Head	−0.679	−0.909	−1.077	0.191
Married	0.747[c]	0.965[c]	0.579[a]	0.805[a]
Family Size	0.224[c]	0.350[c]	0.209[b]	0.121
Expected Duration of Tenancy	−0.205[c]	−0.076	−0.234[c]	0.019
High Income Constraint		−1.437[c]		−1.409[b]
Moderate Income Constraint		−1.046[c]		−0.735
Interactive Term		−0.0000009		−0.00003
High Wealth Constraint		−2.885[c]		−1.375[b]
Moderate Wealth Constraint		−1.918[c]		−1.953
Interactive Term		0.0000016	−0.00006[c]	

[a]significant at 10% level
[b]significant at 10% level
[c]significant at 10% level