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Credit Impairment and Housing Tenure Choice

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ABSTRACT

We analyze the relationship between underwriting standards and low-income homeownership rates using the 1979 National Longitudinal Survey of Youth. The survey respondents are a nationally representative sample of Americans mostly 40-48 years of age as of the most recent wave of the survey in 2004. Past research has identified credit impairment, wealth constraints, and income constraints as finance-related barriers to homeownership. Using a model of tenure choice, we find that absent all three constraints, the homeownership rate of low-income households in our sample would increase from 52.5 to 59.3 percent. Approximately half of this differential is attributable to households with impaired credit and those with 'thin-file status,' the lack of a substantial credit history.

1. INTRODUCTION

Analyses of the tenure choice decision of households have identified the importance of wealth and the associated downpayment constraint, along with lifetime earnings and household characteristics. In particular, downpayment constraints have been found to be important separate from the impact of wealth on permanent income. Studies have estimated the impact of mortgage qualification requirements using a number of alternative data sources and empirical approaches. These studies, including Linneman and Wachter (1989), Zorn (1989) and LaFayette, Haurin and Hendershott (1994),

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consistently find wealth to be quite important in determining ownership tendencies through the financing constraint.

The last fifteen years or so have seen the development and pervasive use of automated underwriting using credit scoring models, with credit quality increasingly a factor in mortgage lending decisions. Credit scores are used to determine eligibility for mortgages in the prime market and the price of mortgages in the subprime market for borrowers with impaired credit. Thus, it is of interest to evaluate the impact of this phenomenon on tenure outcomes. Household savings and credit score levels are the result of intertemporal tradeoffs of consumption and labor supply. As a result, behavior prior to choosing tenure status will impact the price of credit as well as savings available for necessary level of downpayments. However, these factors are also determined in the long run by household permanent income, human capital, and price of housing, which varies from market to market.

If a household desires to own, behaviors may change to facilitate savings and/or improve credit scores. Alternatively, because building good credit and saving for the downpayment may be more difficult for some households and in some places than elsewhere, some households may choose to forego homeownership. The degree to which credit impairment along with downpayment and income constraints impact homeownership has been little studied, in part because of the lack of data. In this paper we use data from the 2004 National Longitudinal Survey of Youth (NLSY) to address specifically the role of credit impairment and in homeownership.

Moreover, because lenders may have become increasingly reliant on credit scores in their lending decisions and more willing to aggressively underwrite by allowing higher

loan-to-value ratios, it is possible that the wealth constraint has been substantially eroded. Historically the evidence suggests that income constraints were eroded by the adoption of adjustable rate mortgages in the 1980s (Linneman and Wachter, 1989). In this paper we test for whether the credit scoring developments of the past decade may have similarly eroded the downpayment barrier to homeownership.

Our study is distinguished from previous studies both by its focus on credit factors, as well as by its data source—the NSLY sample of individuals who were U.S. residents in their teens or early 20's in 1979 observed periodically through 2004. The NSLY context places the focus on long-term homeownership outcomes and highlights the impact of financing constraints on homeownership status among (non-immigrant) individuals well into adulthood. Previous studies of tenure choice using NSLY data look at outcomes for these individuals at younger ages and ignore credit history, as it was not included until the 2004 wave. Studies relying on other data sources such as the Survey of Consumer Finances consider a cross-section of individuals of varying ages, and almost all restrict attention to wealth and income constraints.

Furthermore, the study updates previous examinations of the role of financing constraints to 2004, and thus is distinguished by its historical context. In the decade prior to 2004, conditions in mortgage and housing markets had been relatively stable and favorable for homeownership, and they subsequently became less so.

The paper is organized as follows. Section 2 provides a review of the literature on financing constraints in relation to homeownership. Section 3 reviews the historical context for the analysis. Section 4 describes the data and section 5 describes our

methodology. Section 6 presents the results. Section 7 discusses some implications of the results and section 8 concludes.

2. LITERATURE REVIEW

A series of research studies going back nearly two decades examines the issue of financing constraints in relation to homeownership. Most of this work has focused on income and wealth constraints, defining a household to be financing constrained if they have insufficient income or wealth to purchase a home at the price they would pay if not constrained. Determination of which households are financing constrained is based on loan-to-value and payment-to-income ratio requirements of mortgage lenders.[2]

A robust finding from this literature is that wealth constraints (insufficient funds for downpayment and closing costs) have been a significant barrier to homeownership. An implication is that differential savings rates have contributed to differences in homeownership across demographic groups.[3] For instance, Quercia, McCarthy and Wachter (2003) estimate that for African American households, the rate of increase of homeownership associated with reducing income and wealth constraints is twice that of the overall population.

Relatively few studies have considered credit quality as an additional, potential financial barrier to homeownership. Rosenthal (2002) uses the 1998 Survey of Consumer Finances to quantify the impact on homeownership of having been credit constrained for any reason, including a poor household credit rating. Estimating a two-equation system

[2] See, for instance, Zorn (1979), Linneman and Wachter (1989), Haurin, Hendershott, and Wachter (1997), Quercia, McCarthy, and Wachter (2003) and the references cited in these papers.
[3] Studies generally have failed to detect a significant income constraint component, although the distinction between wealth and income constraints may sometimes be blurry, such as in cases where the barrier to obtaining a low downpayment loan is inability to make higher monthly payments.

of the probability of being credit constrained and probability of being a homeowner, he quantifies the overall impact of financing constraints to be a lowering of the national homeownership by 4 percentage points. He also demonstrates a link between credit quality and homeownership, as bankruptcy and a history of delinquent loan payments contribute significantly to being credit constrained. Barakova, Bostic, Calem, and Wachter (2003) construct separate indictors for credit quality, wealth, and income constraints and examine the evolution of financial barriers across the 1989, 1995, and 1998 Surveys of Consumer Finance. They find wealth constraints to be the predominant barrier to homeownership, and credit impairment another significant barrier. They find that the impact of the wealth constraint declined during the 1990s, but the positive impact on homeownership propensities was partly offset by an increase in the proportion of households with impaired credit.

The research on financial barriers to homeownership is contained within a broader literature on barriers to homeownership.[4] Rates of homeownership among lower income and minority households are substantially lower than in the rest of the population, and these gaps have been attributed to a variety of factors, including credit barriers. Herbert, Haurin, Rosenthal, and Duda (2005) review the literature pertaining to these factors, which may be broadly separated into those related to a household's preference for

[4] There is a large literature on potential economic and social benefits of homeownership, which is surveyed in Haurin, Dietz, and Weinberg (2003); Dietz and Haurin (2003); and Herbert and Belsky (2006). Studies suggest that historically, homeownership has been a relatively effective vehicle for wealth accumulation for many lower income households, but can also entail substantial financial risks. Another important strand of the literature suggests that homeownership has beneficial effects on child outcomes such as educational performance, although such impacts are difficult to establish conclusively due to unobserved individual or household characteristics that might explain the effects. Regarding the implications of homeownership for neighborhoods or communities, the most robust findings are positive impacts of homeownership on participation in civic activities, such as voting, and positive impacts on property maintenance and improvement

owning compared to renting (demand-side) and those pertaining to access to single-family housing or to mortgage credit (supply side).

A number of supply side factors other than financing constraints may impede homeownership among lower-income and minority segments of the population. In particular, Herbert, Haurin, Rosenthal, and Duda (2005) note that lower-income or minority households could face more restricted supply than other households if they may have more limited employment or commuting options, which may limit their neighborhood choices.[5] Hilber (2005) argues that neighborhood externalities that are associated with increased property value risk adversely affect homeownership rates. Evidence also suggests that a lack of adequate information about the mortgage market among some households may result in higher-than-necessary borrowing costs for such households or may deter them from borrowing in the first place (Courchane, Surette, and Zorn 2004).[6]

Propensities for homeownership also differ across income and demographic groups due to demand-side factors associated with mobility or length of residence, which influence the choice between renting and owning. Such factors include age; marital status; number of dependents; and job stability. Financial returns to ownership are greater and risk of financial loss smaller the longer the length of ownership, since there are significant transactions costs associated with purchasing a home and house values can be volatile. Moreover, since the transactions costs associated changing residence are

[5] Potentially, minority households may also face housing market discrimination that limits their choice of residential location.

[6] Another type of informational barrier that may curtail the flow of credit to particular segments of the mortgage market, discussed by Nakamura (1993) and Lang and Nakamura (1993), is based on the notion of *information externalities*. Nakamura theorizes that neighborhoods with few home sales generate too little information to support accurate property appraisals, leaving lenders less willing to extend credit. The resulting lack of credit hinders the development of a more robust housing market, causing the informational barrier to persist.

significantly lower for renters, households that are likely to move within a relatively short period of time may be better off as renters.

Another important demand-side determinant of tenure choice is household income. In general, lower income households have less ability to absorb financial shocks. Therefore, they may be less willing to bear risks associated with ownership, including risks of house value decline and unanticipated maintenance and repair expenses. Moreover, average, after-tax return to investment in housing also differs across income groups.[7]

The present study revisits the issue addressed in Barakova, Bostic, Calem, and Wachter (2003) regarding the role of credit impairment alongside of wealth and income constraints as a financial barrier to homeownership. The study adopts the methodology of Haurin, Hendershott, and Wachter (1997), and likewise relies on data from the National Longitudinal Survey of Youth. Accordingly, this study focuses on the longer-term homeownership status of a specific generational cohort, as opposed to point in time outcomes across a broad population. In addition the present study addresses potential endogeneity issues not addressed by Barakova, Bostic, Calem, and Wachter (2003), and incorporates an additional credit quality indicator based on "thickness" of the individual's credit file.

3. HISTORICAL CONTEXT

Our study updates previous examinations of the role of financing constraints to 2004, and thus is distinguished by its historical context. In retrospect, the decade prior to

[7] The benefit from tax-deductibility of mortgage interest payments and non-taxation of capital gains on owner-occupied housing are greater for higher income households, due to their higher marginal tax rates and their greater tendency to itemize deductions on their income tax returns.

2004 was a period of stability and expanding credit availability in mortgage and housing markets. House prices had been relatively affordable while barriers to mortgage financing had been lessening and ownership rates rising. Subsequently, housing and mortgage markets became less stable and conditions for homeownership less favorable. Beginning in 2004, affordability declined rapidly due to accelerating house price appreciation and ownership rates leveled off, while at the same time, subprime and alt-A lending volumes increased dramatically. As we now know, this expansion of credit proved unsound. By the end of 2007, the boom in housing and mortgage markets had turned into the current bust, with collapse of subprime lending, ballooning credit losses, reduced credit availability, and declining homeownership.

Affordability and ownership trends. The left hand panel of Figure 1 depicts the monthly time series of the affordability of purchasing a single-family home, as measured by the National Association of Realtors (NAR) index for the aggregate U.S., during 1995 through 2007.[8] Until 2004, single-family homes were comparatively affordable, and changes in affordability were seasonal or, as in 1996 and 2000, a consequence of higher interest rates. Subsequently, during 2004-2006 housing market boom, affordability declined sharply to historically low levels due to rapid house price appreciation, then recovered some during 2007 as the market cooled.

The right hand panel of Figure 1 depicts the quarterly time series of the U.S. homeownership rate, by household income classification, based on the Housing Vacancy

[8] The NAR affordability index measures whether or not a family earning the U.S. median family income (as reported by the U.S. Census) can qualify for a mortgage loan on a median-priced (as calculated by NAR) pre-existing single-family home. The calculation assumes a down payment of 20 percent, prevailing mortgage market interest rates from the Federal Housing Finance Board and HSH Associates, and 25 percent qualifying ratio of monthly principal and interest payment to monthly income. See http://www.realtor.org/Research.nsf/Pages/Hameth.

Survey of the U.S. Bureau of the Census, during 1995 through 2007. Homeownership rates in the United States were increasing through 2004, for households in each income classification, above and below the U.S. median income. After 2004, the homeownership rates leveled off and then, in 2007, began to dip.

***Prime mortgage market trends*.** In addition to affordability and a favorable economic environment, developments that made mortgage credit more accessible likely contributed to the rise in homeownership prior to 2004. For instance, Bostic and Surette (2001) conclude that, in addition to the economic environment, "changes in mortgage and housing markets, and changes in the regulations governing those markets" likely played an important role, particularly for lower-income families.[9] Chambers, Garriga, and Schlagenhauf (2007) argue that expansion of mortgage choice, particularly in high loan-to-value ranges, contributed to the rise in homeownership rates.

In the decade prior to 2004, prime lenders made important strides in reducing barriers to mortgage financing, through establishment or expansion of affordable lending programs.[10] These programs feature flexible underwriting standards, resulting in increased credit risk exposure, and risk mitigation activities, such as credit counseling. Typically, one or more of the following underwriting flexibilities are applied: low down payment requirements; higher acceptable ratios of debt payment to income; the use of alternative credit history information such as records of payments for rent and utilities; flexible employment standards; reduced cash reserve requirements; and flexibilities with

[9]They find that changes in household characteristics, including demographic changes with respect to age, marital status, and household size; and changes in education levels and incomes explain much of the increase in homeownership for middle- and upper-income families, but little of the increase for lower-income families. Additional, circumstantial evidence is found in Avery, Calem, and Canner (2004).

[10] Avery, Bostic, Calem, and Canner (1996) and Avery, Bostic, and Canner (2000) present detailed discussion of affordable home lending programs; the latter provide findings from a survey of these programs. Listokin and Wyly (2000) present case studies of a number of such programs.

respect to property evaluations such as applying less weight to neighborhood vacancy rates. [11] In most cases, eligibility is restricted to low- or moderate-income borrowers, first-time homebuyers, or households purchasing a home in a low- or moderate-income neighborhood.[12]

Fannie Mae, Freddie Mac, and private mortgage insurance companies established analogous programs during this period. For instance, in Freddie Mac introduced its Affordable Gold® 97 product, that permitted borrowers to make 3 percent down payments from personal cash and use other sources to cover closing costs, and offered flexible payment ratios. Shortly thereafter, Freddie Mac introduced an alternative, low-downpayment product for borrowers with good credit, allowing them to obtain cash for a 3 percent downpayment from a combination of options, such as gifts and grants. In 2000, Freddie Mac offered the Freddie Mac 100 product, that allows zero downpayment. In 1994, Fannie Mae initiated a series of underwriting experiments, including its Flexible 97 product that permitted borrowers to make 3 percent down payment from a variety of sources. In 2000, Fannie Mae released its MyCommunityMortgage suite of products, which offer low downpayment options for low- to moderate-income borrowers.

The introduction of automated underwriting systems may have been an additional factor contributing to wider availability of mortgage credit. Gates, Waldron, and Zorn (2003) present evidence that introduction of Freddie Mac's automated underwriting model in 1995 led to an increase in acceptance rates of applications for mortgages on

[11] The programs also generally involve subsidies to borrowers. These may take the form of lower interest rates than would ordinarily be associated with the credit risk of such loans, sometimes even below prime market rates. Subsidies may also involve the waiving of private mortgage insurance requirements or reducing or waiving of points or fees. In some cases, the lender may partner with a government program or a private, nonprofit community reinvestment fund that provides the subsidy.

[12] Some programs also require that the borrower be a first-time homebuyer. These programs are further characterized by special marketing efforts to targeted groups.

properties located in low- and moderate-income neighborhoods. They conclude that implementation of automated underwriting systems reduced the cost and increased the accuracy of credit decisions, making mortgage credit more accessible.

Subprime and FHA trends. During the decade prior to 2004, subprime lending grew to become an important segment of the home purchase mortgage market.[13] Subprime mortgage lending historically through 1995 consisted primarily of cash-out refinance loans, often for debt consolidation, and second liens. The subprime share of overall home purchase increased steadily after 1995, as indicated in Figure 2 with respect to the market share of subprime-specializing institutions.

After 2002, the rate of expansion of subprime home purchase lending accelerated. Subprime share of both home purchase and refinance lending doubled between 2002 and 2004, and remained elevated through 2006.[14] The high volume of subprime lending during 2004-2006, and the concurrent expansion of alt-A lending, apparently was sustained, in part, through looser underwriting and miscalculations of potential credit risk.

Growth in subprime home purchase lending does not entirely represent a net increase in availability of mortgage credit to higher-risk borrowers. Some portion of this growth may be attributable to substitution away from FHA lending or from CRA-related

[13] The subprime market serves borrowers with elevated credit risk. Subprime borrowers pay higher interest rates and more points or fees for mortgage credit, or may be required to make sizeable down payments as further compensation for risk

[14] The drop in share indicated for 2006 in figure 2 reflects a decline in the share of subprime loans originated by subprime specialists as defined by the 2005 HUD list, and an increase in subprime lending by non-specialist institutions, rather than a decline in subprime share per-se.

affordable lending programs. In fact, the FHA-insured share of home-purchase lending declined sharply after 2002, as shown in Figure 3.[15]

4. DATA

We use data from the most recent wave of the 1979 National Longitudinal Survey of Youth (NLSY79), which occurred in 2004. The U.S. Department of Labor's Bureau of Labor Statistics conducts the NLSY79, and it is housed at Ohio State University's Center for Human Resources Research. The Survey was initiated in 1979 and has been conducted every few years since. The age of respondents at the time of the 2004 wave varies between 27 and 48; the great majority of the sample is 40 or older.

The NLSY79 data include detailed information on household wealth and income, along with a variety of information on items ranging from family demographics to housing, education and health status. For the first time in 2004, the NLSY79 included information on factors related to the respondents' credit quality, enabling us to address the role of credit impairment as a barrier to homeownership. We identify a household as being credit impaired if it is at the maximum limit on more than one credit card; has been rejected for credit in the past five years; or has declared bankruptcy in the past nine years.

The 2004 NLSY data include highly disaggregated data on household assets and liabilities, down to a level of detail such as up to fifteen separate retirement savings accounts and the amount of equity in three distinct vehicles. We sum up these individual

[15] Kogler, Schnare, and Willis (2006) document the decline in FHA market share and provide an analysis of the decline based on a lender opinion survey. An and Bostic (2006) provide empirical evidence of a shift in market share from the FHA-insured to the conforming, conventional market.

items into a single variable, total family wealth.[16] We utilize summary variables for household wage income and total family income that are included in the NLSY. We discuss in detail how we define a family as wealth or income constrained in our methodology section, below.

Table 1 reports descriptive statistics for key variables used in this study, including respondents' wages, marital status, family structure, score on an aptitude test, income, wealth, size of inheritances received, health, race, ethnicity, gender, and housing tenure choice. All statistics in this table use 2004 sampling weights intended make the sample nationally representative.[17] See Haurin et al. (1996) for a discussion of data quality and the degree to which the NLSY79 sample mirrors the national population.

A total of 7661 respondents were interviewed in 2004. Of these, 7583 have valid information for homeowner status and were residing in the United States. We use information on divorce, unemployment, and health status from the 2000 and 2002 surveys. 7414 members of our potential sample were interviewed in one or both of these years.[18] We then dropped observations that were missing information on assets, debts, wage or labor force participation, health status, spouse age or highest grade achieved, and credit history. The final sample contains 5977 observations.[19]

[16] See Zagorsky (1997) for a detailed discussion of the NLSY wealth data. We define wealth as the sum of the value of all assets (retirement accounts, mutual funds, stocks, bonds, certificates of deposit, checking and savings accounts, vehicles, collections, stock, real estate, businesses and professional practices) less the sum of the value of all debts (mortgages, other residential debt, credit card, student loans, debt for businesses, debt owed on vehicles, and miscellaneous debts.)

[17] See Chapter 2 section 8 of the NLSY79 users guide for information on the sampling weights. It is available at http://www.bls.gov/nls/nlsy79.htm.

[18] Respondents who were not interviewed in one of the years are identified with a dummy variable in all estimating equations where the historic information is used.

[19] A large number of observations had missing or invalid information for the score on the aptitude test and race. We include such observations in the sample, but identify them with a dummy variable in all equations where such information is used.

A limitation to the study is that we only have contemporaneous information on credit. Our sample is also limited largely to Americans who were present in the United States in 1979, are still residing in the US in 2004, and are between the ages of 39 and 47. It is therefore unclear if our results apply to other age groups or to understanding the housing choices of immigrants.[20]

5. METHODOLOGY

We investigate the effect of credit impairment on homeownership, controlling for income and wealth constraints and other household characteristics. Our methodology follows earlier studies by Haurin et al (1994) and Haurin et al (1997).

In brief, the estimation process is described as follows. The first step is to estimate an "unconstrained" housing demand function that is used to estimate each household's desired home value (the value of the home conditional on choosing to own and on not facing wealth or income constraints or credit impairment). We then compare this desired home value to the household's wealth and income, and designate the household as wealth or income constrained if it is unable to afford a home of that value with standard financing. We designate a household as credit impaired if it has a history of credit denial, bankruptcy, or very high level of credit utilization. It is 'thin-file' if it has a history of no debt utilization.[21] Finally, we estimate a probit equation for the probability of homeownership using these three constraints and other variables related to homeownership.

[20] See Painter et al (2001) for a discussion of tenure choice among immigrants.
[21] Households with missing information about their credit history are excluded, not treated as thin-file.

The housing demand equation relates a household's desired home value to household income, demographic variables, and geographic location.[22] This equation is estimated within the group of 'unconstrained' homeowners, i.e. homeowners whose home value is such that their wealth is sufficient for a downpayment on their current house, they have sufficient income for the mortgage, taxes and insurance, and they have good credit. As membership in this group is not a random event, we control for sample selection by jointly estimating the probability of being an unconstrained homeowner with our housing demand equation. Results from this joint estimation are in Table A1 of the appendix.

We designate a household as being *credit impaired* if it is at the maximum limit on more than one credit card, has been rejected for credit in the past five years, or has declared bankruptcy in the past nine years. Households that lack credit history are known in the industry as 'thin-file,' and often have trouble obtaining credit. We designate a household as *thin-file* if they have no history of a positive amount of debt and fully responded to all debt-related questions for the entire history of the NLSY. A household is *wealth constrained* if its wealth, for which we use both the actual number and an estimate with instrumental variables, is less than 5% of its estimated preferred home value. It is *income constrained* if 28% of its annual income, again using both the actual value and an estimate with instrumental variables, is less than the annual value of

[22] US Census region is the most disaggregated geographic information generally available to the public from the NLSY data. For this study, Professor Wachter obtained access to the confidential MSA-level geographic identifier; such access is granted to academic institutions subject to certain qualifications.

mortgage payments, taxes, and insurance where the mortgage would be for 95% of the home value.[23]

Wealth, and to a lesser degree, income and credit quality, are potentially endogenous to homeownership. A household's wealth, income and credit history, as observed in 2004, may be influenced by past decisions regarding housing tenure choice. This is particularly true of wealth, which for homeowners can be substantially impacted by appreciation or depreciation of home values. Moreover, households with a strong unobservable taste for homeownership may simultaneously be those with an unobservable penchant for saving or earning more. Consequently, we use an instrumental variables approach to measure the effects of wealth and income constraints in most of our homeownership equations, and we instrument for credit impairment as well in some specifications.

The models used to construct the instruments are in Tables A2 through A4 of the appendix. Wealth and income are instrumented prior to constructing the binary dummy variable indicating a constraint. Wealth is estimated with an ordinary least squares regression. Income is estimated in a system of equations for the probability of being in the labor force and respondent wage conditional on labor force participation. A similar estimation is performed for the spouses' labor force participation and wage, where applicable. We use the fitted value from a probit for the probability of being credit impaired as an instrument. A particularly attractive feature of the NLSY data is that, as a longitudinal study, there are multiple potential instrumental variables available for inclusion in these equations, in addition to standard demographic variables and measures

[23] We assume a 30-year, fixed rate mortgage with a contract rate of 5.6%, the lowest rate in Freddie Mac's weekly Primary Mortgage Market Survey during 2004.

of educational attainment. For example, the data includes the respondents' scores from the Armed Services Vocational Aptitude Battery (ASVAB) test, a measure of ability, as well as a complete history of incidences of poor health, unemployment, and divorce.

Table 2 shows the share of households facing constraints on homeownership, using actual wealth, credit, and income information as well as instrumented values for wealth and income. The share of households that are constrained shrinks substantially when using instrumented values. For example, using the actual values, 45% of all households face no constraint, while this share increases to 65% using instrumented values for wealth and income. Using instrumental values, about 10% of the sample faces two or more constraints.

In the final stage of our analysis, we estimate the models for the probability of homeownership, using various combinations of the three constraint variables as well as demographic and other control variables. All models have tenure choice as the dependent variable, and are estimated with a binary probit. Controls include race, ethnicity, marital status, whether the respondent has children, and the respondent's education level. Homeownership increases the costs of moving, so we include controls for profession as a proxy for expected mobility. We estimate models with and without use of instruments to control for endogeneity of wealth, income, or credit history. Originally, we also included the ratio of area median house price median rent (as of 2004), which is often included in tenure choice models as a proxy for expected capital gains. We dropped this variable from the models because it lacked statistical significance and had no appreciable impact on other estimated coefficients.

A total of eight models are estimated. The first two, models I and II are estimated without instruments. Models III and IV employ instruments for wealth and income constraints. Models I and III exclude the effect of credit quality, restricting attention to wealth and income constraints, while Models II and IV incorporate the (non-instrumented) dummy variable for being credit impaired and the indicator for thin-file. We also re-estimate Model IV restricting attention to recent movers, defined as households that changed residence within the past three years. It is common in the tenure choice literature to make such a restriction, due to the fact that these households necessarily faced a choice between owning and renting.

Model V instruments for wealth and income constraints as well as credit impairment. Finally, Models VI, VI, and VIII address wealth, income, and credit constraints separately, with wealth and income constraints (but not credit impairment) instrumented.

6. RESULTS

Tables 3 through 6 present the results from estimation of the models. We begin by noting that the signs on the control variables are in general agreement with past research. Being married, high-income, having children, and having attained a high level of education are all associated with a higher probability of homeownership. Painter et al (2001) and others have analyzed differences in tenure choice among African-Americans. Consistent with their results, we find that African-Americans have a relatively low probability of homeownership. The magnitude and significance of control variables does not vary much across the models.

In Model I, which excludes credit and ignores potential endogeneity of wealth and income constraints, the coefficients on the wealth and income constraints are strongly negative and significant. The coefficients on credit impairment and thin-file status, which we introduce in Model II, are also negative and significant. Adding the credit impairment and thin-file indicators does not significantly affect the coefficients on any of the controls or the income or constraint variables. These first two models serve primarily as a baseline for Models III through V, which employ instruments to address potential endogeneity of wealth, income, and credit.

Model III includes only the wealth and income constraints, and thus is comparable to Model I. The primary difference between the estimation results for Models I and III concerns the estimated effect of the wealth constraint; the magnitude of this coefficient shrinks from -2.04 (t=-36.96), 160% of the size of the coefficient on the 'married' dummy, to –0.39 (t=-4.65), which is 35% of the coefficient on 'married'.[24] The estimated coefficient of the income constraint indicator increases from –0.24 (t=-4.68) to –0.32 (t=-4.30); a difference that is not statistically significant. Both income and wealth constraints appear to have a negative impact on the probability of homeownership for this population, with or without controlling for endogeneity.

Model IV includes corrections for the potential endogeneity of wealth and income, as well as dummy variables for being credit impaired and having a thin credit file. Comparison of the coefficient on credit between Models II and IV shows a substantial effect of controlling for the endogeneity of income and wealth. Using the coefficient for the dummy variable 'married' to normalize other coefficients, the

[24] In probit and other index models, the relative magnitude of the coefficients has a clearer interpretation than their size. See the beginning of Chapter 15 in Woodridge (2002) for a discussion.

magnitude of the credit impairment dummy increases from -0.12 (compared to 1.27 for 'married') to –0.37 (compared to 1.11 for 'married.'), a three-fold increase in relative size. Excluding controls for the endogeneity of wealth and income may mask the importance of good credit. For instance, inability to attain homeownership due to poor credit history may adversely impact a household's ability to build wealth.[25]

We find that having a thin credit file is even more strongly associated with a lower probability of homeownership than credit impairment. The magnitude of the coefficient in Model IV, -0.67, is almost twice the magnitude of the dummy for impaired credit. Moreover, this result is consistent across all specifications that include the two credit constraint measures.

Model V includes all three constraints estimated with instrumental variables. The coefficient on credit impairment retains its negative sign and its statistical significance, but it increases in absolute value by a factor of six compared to the coefficient of a simple dummy variable. This change likely reflects increased colinearity from use of instruments, so we interpret the increase in magnitude with caution.

It is common in the tenure choice literature to limit a sample to recent movers.[26] Given the substantial transaction costs involved in moving, the choices of recent movers may be a more accurate reflection of their optimal choice. Such a limitation reduces our sample from 5977 to 1627 observations. The results from re-estimating Model IV on this subsample are shown in Table 5. The size of the coefficients on the wealth constraint,

[25] Replacing the instrumented income with actual income to indicate income constrained in Model IV does not have a significant effect on any of the other coefficients. As one would expect, the effect of the income constraint without instruments is larger and more significant; the t-statistic changes from –3.94 to –15.96, a substantial change in magnitude.

[26] For example, see Barakova (2003).

income constraint, and indicators for credit impairment and thin-file status all remain negative and significant.

A possible concern with our results is that wealth, income, and credit are mutually correlated, and their common presence in the estimation may distort the magnitude of the coefficients. Table 6 shows the result of estimation of Models VI, VII, and VIII, which each have only one of the income and wealth constraints and credit impairment variables. The results appear to be robust to inclusion of these indicators one at a time.

Impacts on low-income homeownership. We apply the estimation results to quantify the effects of the financial constraints on the homeownership rate among low-income households. We define a household as low-income if its income is less than 80% of the state median. Of the households in our sample, 2,469 qualify as low-income. Their homeownership rate is 52.5 percent, and about 45 percent have some combination of a wealth or income constraint, credit impairment, or thin-file status. We quantify the impacts of the constraints by assessing the effect of their hypothetical removal, individually or in combination, on the overall homeownership rate among the low-income households, using the coefficients from Model IV. Results are shown in Table 7.

We find that the largest effect attributable to a single constraint, about 2.7 percentage points, is associated with credit impairments. In spite of the fact that only 5% of the sample is 'thin-file', removing this constraint would increase homeownership among low-income individuals by almost 1 percentage point, about the same impact attributable to the income constraint.[27] The joint impact of credit impairment and thin-

[27] Since our sample is limited to respondents who were present in the United States in 1979, we exclude more recent immigrants. Immigrants have had less time to create records used by the credit scoring industry. Consequently we probably understate the frequency of 'thin-file' status in the general population, and possibly understate the possible increases in homeownership resulting from addressing this issue.

file status on low-income homeownership is 3.5 percentage points; the joint impact of the income and wealth constraints is about 3.1 percentage points. The combined impact of all four financing constraints on low-income homeownership is 6.8 percentage points.

7. DISCUSSION

Consistent with previous studies, we find that financing constraints are a significant obstacle to homeownership. Our study is distinguished from previous studies both by its specific context—the NSLY sample of individuals who were U.S. residents in their teens or early 20's in 1979 observed periodically through 2004—as well as its new findings concerning the importance of credit factors.

The results point to a primary role of credit factors, including impaired credit and lack of credit history. In previous analyses of the impact of financing constraints on homeownership, such factors were either ignored or were found to be secondary to wealth constraints.

Relative importance of credit impairment. The coefficient on credit impairment is strongly significant for all models, confirming that credit is a substantial barrier to homeownership. This finding is consistent with Barakova et al. (2003), who found a similar relationship from an analysis of the US Survey of Consumer Finance. Our results differ from Barakova et al. in that we find that credit impairment is of similar magnitude as wealth constraints for this sample. In Table 5 of Barakova et al., the coefficient on credit impairment is typically half that of the coefficient on the wealth constraint.

The relatively large magnitude of the credit impairment effect in our study may reflect its more recent, historical context that incorporates institutional changes in the

mortgage market, as well as the distinct nature of the NSLY sample. Barakova et al. used Survey of Consumer Finance data from 1989, 1995, and 1998, which are cross-sectional surveys, while our data focuses on a particular generational cohort as of 2004. Over the decade from 1995 through 2004, lenders became increasingly comfortable with higher loan-to-value ratios for those with relatively sound credit history.[28] Downpayment assistance also became more widely available during this time, and again may have been most easily available for those with good credit records. Both of these trends would have decreased the importance of the wealth constraint relative to the credit constraint.

Importance of thin-file status. 'Thin-file' status, or the lack a history of debt use sufficient to generate a conventional credit score, is another potential barrier to homeownership. The most frequently used channels for access to credit are often closed to borrowers when they do not have a FICO score or other commonly used credit-worthiness metric.[29] Our results suggest that thin-file status, while less common than credit impairment for individuals in the age cohort represented by our sample, constitutes a more formidable barrier to homeownership.

There is a growing industry of 'alternative' credit scores that incorporate data on households' payment history with respect to rent, utilities, telecommunications, and other services.[30] Increased use of such alternative data by lenders could reduce the effect of

[28] A third potential explanation is that, due to life-cycle saving effects, a sample of largely composed of Americans in their 40's, may not contain enough variation in wealth constraints to adequately identify its effect. Examination of Table 2 should allay such concerns, as our sample contains several hundred wealth constrained households. The NLSY over-samples respondents from low-income homes, who are more likely to be wealth constrained later in life.

[29] Access to mortgages and other forms of credit are available to those without conventional credit scores, often through processes known as 'manual underwriting,' where the borrower gathers documentation of their income and past payments, and the lender reviews the documentation. These processes are expensive for both parties, and are infrequently used relative to automated channels.

[30] Examples of vendors that have developed such scores include the Fair Isaac Corporation (see especially the Expansion Score; http://www.fairisaac.com) L2C, (http://l2cinc.com) and PRBC (http://prbc.com).

thin-file status as a barrier to homeownership, and thus be a relatively effective route for increasing homeownership rates.

8. CONCLUSION

The size of the credit-related coefficients and the results of the policy experiments together show that poor credit records and thin-file status are highly significant barriers to homeownership. Policies that could address these problems include credit counseling and education for potentially credit impaired households.[31] New credit scoring methodologies that use a richer set of data than conventional scores could be an important tool for expanding homeownership.

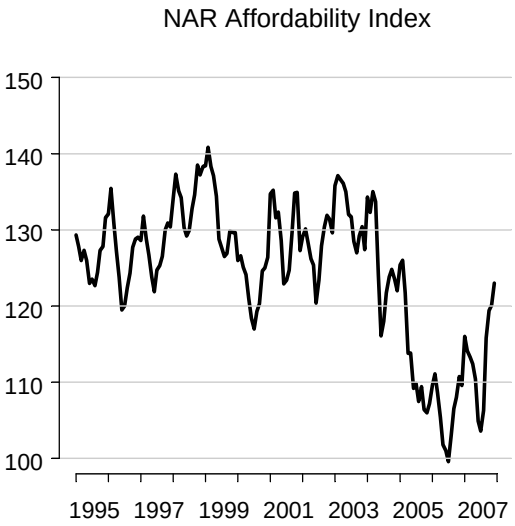
The ongoing foreclosure crisis demonstrates that relaxing income, wealth, and credit constraints can have negative unintended consequences. Our results suggest that increased use of alternative credit scores, combined with expanded financial education, could yield increases in low-income homeownership of a similar magnitude to those achievable through looser underwriting standards. Focusing on improving household credit quality and addressing thin-file barriers to mortgage credit may be a less risky and equally effective means of increasing homeownership among low-income households.

Our data are limited to households that include a member in a particular age range who was present in the US in 1979. Consequently, our results may not generalize to other age groups or immigrants. Younger households, in particular, have had less time to accumulate wealth and acquire the work experience associated with higher income, and thus may be more affected by wealth and income constraints. As credit bureaus do not collect payment information from overseas, immigrants may be more severely impacted

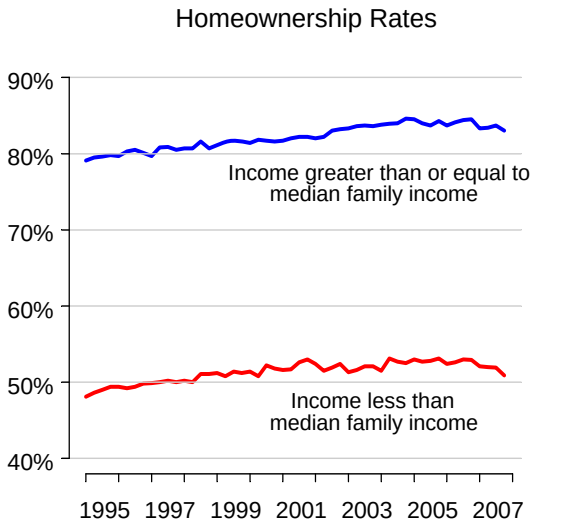
[31] For discussions of the effect of financial education on consumer behavior, see Bernheim and Garrett (2003) and Courchane and Zorn (2006).

by ‘thin-file’ status and less affected by a history of credit impairment than members of our sample. Nonetheless, our results suggest that financial education and the expanded use of alternative credit scores are promising avenues for increasing homeownership among low-income households.

Figure 1: Affordability and Homeownership Trends

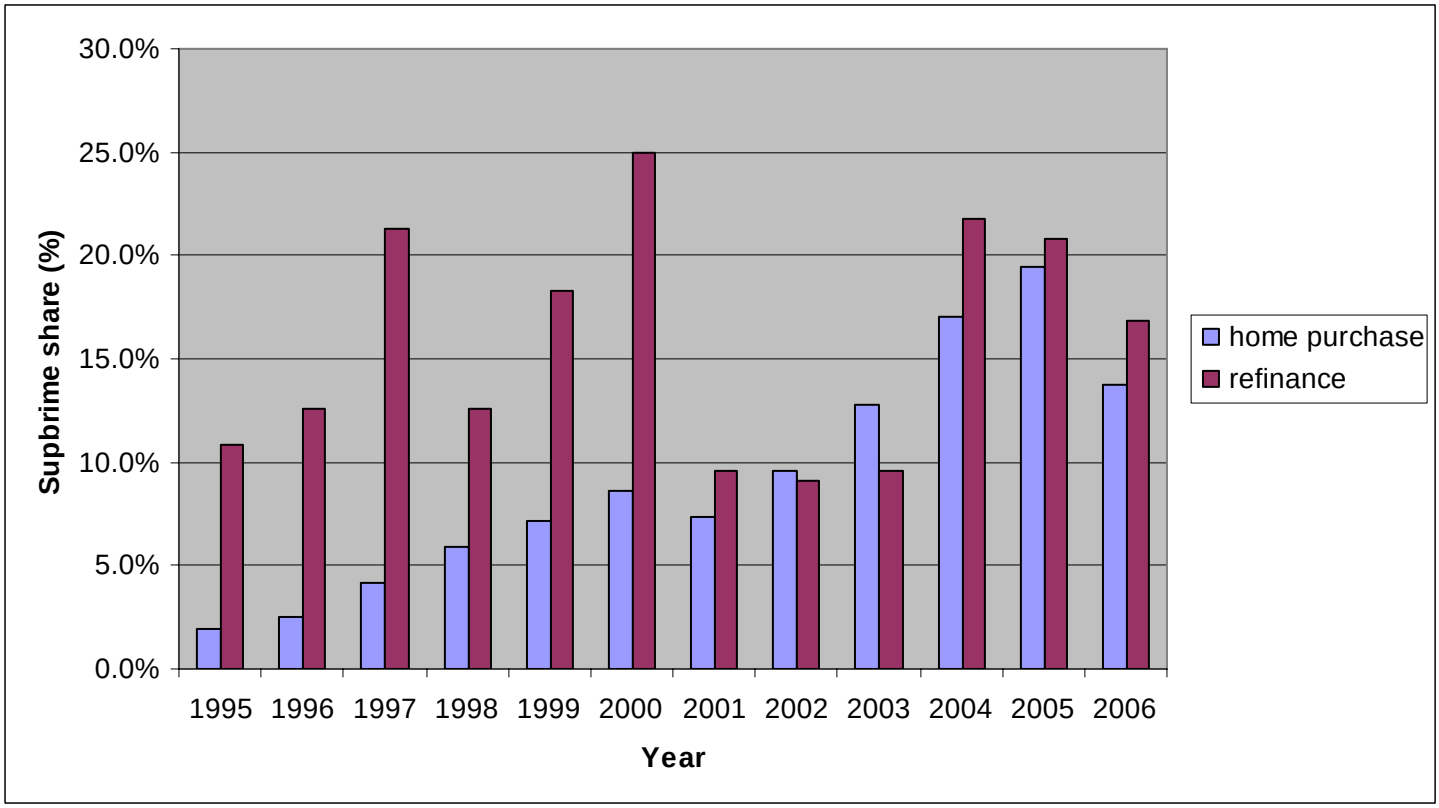


Source: National Association of Realtors, as of June 2008.



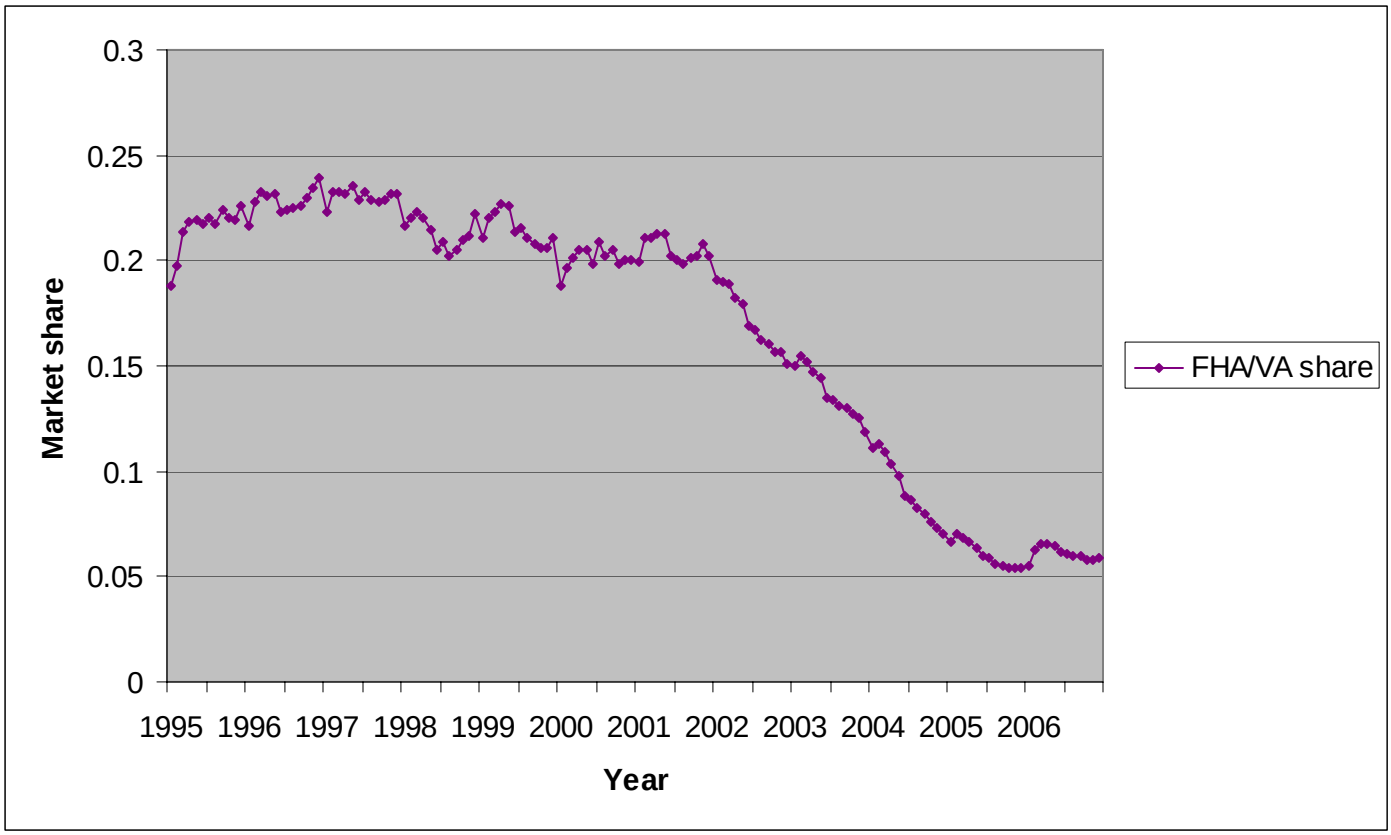
Source: Bureau of the Census: Housing Vacancy Survey, Table 8.

Figure 2: Market Share of Subprime Specialists



Note: Share is with respect to number of conventional mortgage origination. Attention is restricted to 1-4 family, owner-occupied properties.
Source: HMDA data and HUD list of subprime specializing institutions

Figure 3: Market Share of FHA/VA Insured Loans



Note: Share is with respect to number of mortgage originations
Source: Federal Reserve Board HMDA monthly time series

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Table 1: Descriptive Statistics
Panel A Continuous Variables

Variable	Num Non-Zero Obs	Mean	Std Dev
Age	5977	43.32	2.32
Apptitude Test Score	5771	5.36	2.87
Family Size	5977	3.10	1.51
Highest Grade Attained	5977	13.57	2.54
Home Value	3733	234,086.40	234,229.10
Inheritance Value - 1988	451	7,793.89	17,495.14
Inheritance Value - 1989	467	25,297.00	148,269.40
Inheritance Value - 1990	454	9,096.89	25,350.47
Inheritance Value - 1991	407	7,358.29	17,685.48
Inheritance Value - 1992	468	9,084.16	27,090.51
Inheritance Value - 1993	457	9,047.25	26,349.12
Inheritance Value - 1994	401	9,922.13	21,843.49
Inheritance Value - 1996	400	15,230.59	42,251.06
Inheritance Value - 1998	392	25,634.08	78,452.32
Inheritance Value - 2000	472	24,022.70	59,740.76
Inheritance Value - 2002	376	28,564.00	63,168.15
Inheritance Value - 2004	376	49,289.56	193,966.20
Respondent Wage	4992	48,245.46	47,833.38
Spouse Age	3330	43.16	5.63
Spouse Highest Grade Attained	3330	13.84	2.51
Spouse Wage	2679	47,528.36	48,503.76
Wealth	5977	212,236.50	465,911.80

Source: NLSY79
Aptitude Score is decile score on the Armed Services Vocational Aptitude Battery.
Highest Grade is highest grade in school completed by respondent.
Inherit is amount of inheritence received by respondent since last interview date.

Table 1: Descriptive Statistics
Panel B Binary Variables

Variable	Mean
Black	12.85%
Hispanic	6.78%
Bad Credit	18.84%
Thin Credit File	2.21%
In Poor Health - 2004	11.83%
Region=Northeast	15.80%
Region=South	36.53%
Region=West	18.02%
Urban	72.72%
In MSA?	78.78%
Has Children	62.06%
Married	62.95%
In Poor Health - 2002	11.27%
Divorced in 1999 or 2000	2.89%
Divorced in 2001 or 2002	2.75%
Divorced in 2003 or 2004	2.79%
Respondent in Labor Force	78.41%
Male	49.94%
Spouse in Labor Force	70.34%
Profession=Management or Professional	32.57%
Profession=Service	13.35%
Profession=Sales or Office	19.18%
Profession=Construction	9.78%

Table 2: Households with Binding Constraints on Homeownership

Constraint			Number of Households	
Credit	**Income**	**Wealth**	**Actual**	**Instrumented**
Yes	Yes	Yes	263	9
Yes	Yes	No	210	104
Yes	No	Yes	229	170
Yes	No	No	514	933
No	Yes	Yes	966	58
No	Yes	No	844	317
No	No	Yes	450	572
No	No	No	2501	3814

Yes' means constraint binds
Actual' is using actual family income and wealth
Instrumented' is using instrumented family income wealth.
Definitions:
***Credit Impaired** : Bankrupt within last 9 years, rejected for credit within last five years, or at maximium limit on more than one credit card.*
***Income Constrained:** Income is less than 28% of interest, taxes, and insurance on 95% of desired home value as calculated in Table A1.*
***Wealth Constrained:** Wealth less than 5% of desired home value as calculated in Table A1.*

Table 3: Probability of Homeownership
Without Controls for Endogeneity of Wealth, Income and Credit

	Model I			Model II	
Variable	**Estimate**	**t Value**		**Estimate**	**t Value**
Intercept	2.10	2.05		2.38	2.31
Log Instrumented Income	-0.31	-2.43		-0.33	-2.57
Wealth Constraint	-2.04	-36.96		-2.03	-36.30
Income Constraint	-0.24	-4.68		-0.23	-4.56
Bad Credit				-0.12	-2.18
Thin Credit File				-0.63	-3.50
Profession=management	-0.02	-0.06		-0.01	-0.03
Profession=service	-0.13	-0.46		-0.12	-0.42
Profession=sales/office	-0.06	-0.21		-0.05	-0.18
Profession=construction	-0.08	-0.29		-0.08	-0.27
Profession=production	-0.22	-0.79		-0.22	-0.80
Married	1.26	9.55		1.27	9.60
Black	-0.41	-5.67		-0.39	-5.38
Hispanic	0.03	1.25		0.03	1.26
Log Highest Grade Attained	0.76	3.59		0.74	3.52
Kids	0.16	3.00		0.17	3.08
Missing Black	-0.42	-2.87		-0.42	-2.89
Missing Profession	1.99	-0.22		-0.05	-0.18
Number of Observations	5,977			5,977	
Log Likelihood	-1,776			-1,768	

Probit models for probability of homeownership.
Model I excludes the credit impaired dummy
Model II includes the credit impaired dummy

Table 4: Probability of Homeownership

With Controls for Endogenity of Wealth, Income, and Credit

	Model III			Model IV			Model IVa			Model V	
Variable	**Estimate**	**t val**		**Estimate**	**t val**		**Estimate**	**t val**		**Estimate**	**t val**
Intercept	-2.15	-2.36		-1.54	-1.68		-2.70	-2.90		-0.43	-0.45
Log Instrumented Income	0.02	0.15		-0.03	-0.27		0.14	1.22		-0.05	-0.46
Wealth Constraint	-0.39	-4.65		-0.38	-4.60		-0.33	-3.85		-0.33	-3.98
Income Constraint	-0.33	-4.30		-0.30	-3.94		-0.67	-15.96		-0.34	-4.41
Bad Credit				-0.37	-7.98		-0.37	-7.74		-2.41	-5.37
Thin Credit File				-0.67	-4.84		-0.62	-4.27		-0.62	-4.46
Profession=management	0.33	1.50		0.32	1.43		0.21	0.90		0.36	1.62
Profession=service	-0.01	-0.06		-0.01	-0.05		-0.03	-0.11		0.02	0.10
Profession=sales/office	0.17	0.75		0.16	0.74		0.09	0.39		0.20	0.88
Profession=construction	0.10	0.46		0.09	0.40		0.05	0.21		0.12	0.53
Professtion=production	0.00	0.01		-0.02	-0.08		-0.06	-0.26		0.02	0.09
Married	1.09	9.64		1.12	9.85		0.88	7.72		1.03	9.03
Black	-0.43	-7.15		-0.40	-6.63		-0.40	-6.52		-0.33	-5.34
Hispanic	0.03	1.46		0.03	1.35		0.03	1.14		0.01	0.35
Log Highest Grade Attained	0.73	4.09		0.72	4.03		0.62	3.41		0.53	2.88
Kids	0.13	2.98		0.14	3.05		0.16	3.44		0.14	3.17
Missing Black	-0.32	-2.74		-0.34	-2.86		-0.32	-2.61		-0.40	-3.32
Missing Profession	-0.24	-1.06		-0.25	-1.10		-0.14	-0.60		-0.11	-0.48
N Observations	5,977			5,977			5,977			5,977	
Log Likelihood	-2,704			-2,663			-2,543			-2,680	

Probit models for probability of homeownership.

Model III *includes instrumental variable estimates for wealth and income constraints, but excludes credit.*

Model IV *includes instrumental variables for wealth and income constraints, plus a dummy variable for credit impaired.*

Model IVa *without correction for endogeneity of income*

Model V *includes instrumental varibles for wealth and income constraints and credit impairment.*

Table 5: Probability of Homeownership
Sample limited to recent movers only.

	Model IV	
Variable	**Estimate**	**t Value**
Intercept	-3.77	-2.20
Log Instrumented Income	0.15	0.74
Wealth Constraint	-0.36	-2.31
Income Constraint	-0.32	-2.34
Bad Credit	-0.42	-5.07
Thin Credit File	-0.89	-2.40
Profession=management	0.67	1.48
Profession=service	0.29	0.63
Profession=sales/office	0.48	1.06
Profession=construction	0.30	0.65
Profession=production	0.24	0.52
Married	0.82	3.91
Black	-0.41	-3.63
Hispanic	-0.01	-0.24
Log Highest Grade Attained	0.56	1.68
Kids	0.13	1.55
Missing Black	-0.39	-1.68
Missing Profession	0.17	0.38
Urban		
Number of Observations	1,627	
Log Likelihood	-775	

Probit model for probability of homeownership.

Table 6 Results with Single Finance Constraints or Impairments

	Model VI			Model VII			Model VIII	
Variable	**Estimate**	**t val**		**Estimate**	**t val**		**Estimate**	**t val**
Intercept	-1.39	-1.55		-3.55	-4.21		-2.64	-3.15
Log Instrumented Income	-0.06	-0.57		0.13	1.22		0.04	0.40
Wealth Constraint	-0.40	-4.76						
Income Constraint				-0.34	-4.46			
Bad Credit							-0.37	-8.07
Thin Credit File	-0.61	-4.37		-0.61	-4.42		-0.70	-5.07
Mgt/Professional	0.31	1.41		0.33	1.48		0.27	1.21
Service Occupation	-0.03	-0.13		0.00	0.01		-0.04	-0.19
Sales/Office	0.14	0.64		0.18	0.83		0.14	0.63
Construction/Maintenance	0.09	0.39		0.12	0.53		0.07	0.33
Production	-0.01	-0.06		0.02	0.08		-0.03	-0.12
Married	1.20	10.86		0.96	8.81		1.09	10.16
Black	-0.41	-6.83		-0.46	-7.75		-0.45	-7.64
Hispanic	0.03	1.40		0.02	1.11		0.02	0.95
Log Highest Grade Attained	0.74	4.17		0.82	4.59		0.85	4.76
Kids	0.15	3.25		0.14	3.01		0.15	3.28
Missing Black	-0.33	-2.76		-0.29	-2.47		-0.32	-2.68
Missing Profession	-1.80	-1.10		-0.25	-1.13		-0.32	-1.43
N Observations	5,977			5,977			5,977	
Log Likelihood	-2,703			-2,704			-2,682	

Probit models for probability of homeownership.
Model VI *includes only the income constraint effect.*
Model VII *includes on the income constraint effect.*
Model VIII *includes only the credit impairment effect.*

Table A1: Two-Stage Housing Demand

Parameter Estimates			Parameter Estimates		
Parameter	**Estimate**	**t Value**	**Parameter**	**Estimate**	**t Value**
Dependent variable: log home value			***Dependent variable: not constrained by wealth, income or poor credit***		
Intercept	-2.28	-3.66	**Intercept**	-9.55	-14.89
Log Instrumented Income	1.26	22.46	**Log Instrumented**	0.89	14.37
Married	-0.74	-12.53	**Married**	0.28	3.56
Log Family Size	-0.07	-2.07	**Log Family Size**	-0.19	-4.50
East North Central Region	0.28	5.22	**East North Central**	0.04	0.54
Midatlantic Region	0.19	3.02	**Midatlantic Region**	-0.32	-3.48
Mountain Region	0.26	3.72	**Mountain Region**	-0.31	-3.05
New England	0.34	4.39	**New England**	-0.04	-0.32
Pacific Region	0.48	5.33	**Pacific Region**	-0.54	-4.47
South Atlatntic Region	0.22	4.02	**South Atlatntic**	-0.19	-2.33
West North Central Region	0.21	3.41	**West North Central**	0.07	0.67
West South Central Region	0.08	1.27	**West South Central**	-0.13	-1.39
California or Hawaii	0.37	3.84	**California or Hawaii**	-0.47	-3.98
Boston MSA	0.37	2.47	**Boston MSA**	-0.56	-2.65
New York MSA	0.71	4.48	**New York MSA**	-0.56	-3.04
DC MSA	0.34	3.08	**DC MSA**	-0.24	-1.56
In Urban Area	-0.12	-4.61	**In Urban Area**	-0.18	-4.80
In an MSA	0.49	16.11	**In an MSA**	-0.13	-2.79
Sigma	0.62	74.83	**Sigma**	0.02	0.21

Number of Observations	5,977
Log Likelihood	-6,114

Table A2 Estimation for Instrumented Wealth

Wealth Regression - Married Couples

Parameter Estimates		
Variable	**Estimate**	**t Value**
Intercept	-2,647,865.00	-8.38
2000 Inheritance ($)	2.64	5.08
2002 Inheritance ($)	6.61	14.42
2004 Inheritance ($)	0.68	4.84
Log Spouse Age	243,338.00	3.46
Log Spouse's Highest Grade	324,229.00	5.97
Black	-99,915.00	-2.92
Family Size	23,401.00	3.35
Male	54,388.00	2.98
Log Highest Grade Attained	362,053.00	5.93
In Poor Health?	-72,454.00	-2.41
Log Score	52,143.00	3.05
Missing Black?	223,396.00	3.75
Missing Score?	-24,143.00	-0.44
Missing 2000 data?	43,866.00	0.74
Missing 2002 data?	134,139.00	2.12
No. Obs	3,330	
Adj. R-Squared	0.1686	
F-Test	45.99	

Wealth Regression - Singles

Parameter Estimates		
Variable	**Estimate**	**t Value**
Intercept	-691,687.00	-5.45
2000 Inheritance ($)	0.30	1.43
2002 Inheritance ($)	1.27	5.28
2004 Inheritance ($)	0.50	4.72
Black	-40,689.00	-2.82
Family Size	-1,772.66	-0.41
Male	33,684.00	3.08
Age	4,031.11	1.74
Log Highest Grade Attained	219,799.00	7.07
In Poor Health?	-43,843.00	-2.99
Log Score	45,497.00	4.71
Missing Black?	-9,901.35	-0.32
Missing Score?	36,703.00	1.17
Missing 2000 data?	-10,204.00	-0.36
Missing 2002 data?	51,273.00	1.75
No. Obs	2,647	
Adj. R-Squared	0.1041	
F-Test	22.97	

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OLS estimation of wealth. Race and ethnicity variables
pertain to respondent. "Inherit" variables are nominal value of inheritance,
trust or estate received.'Score' is the decile of the core the respondent received on the AVSB,
an appitude test.

Table A3: Instruments for Labor Force Participation and W

Panel A: Respondent Labor Force & Wage

Parameter Estimates		
Parameter	**Estimate**	**t Value**
Dependent Variable: Log Wage		
Intercept	6.86	23.04
Black	-0.08	-2.01
Male	0.35	14.32
Married	0.15	4.77
Age	0.00	0.77
Log Score	0.18	7.80
Log Highest Grade Attained	1.13	14.77
Family Size	0.03	3.07
Northeast Region	0.14	4.29
South Region	0.04	1.52
West Region	0.07	2.08
Urban Area	0.07	3.36
Missing if Black	-0.12	-1.48
Missing Score	0.22	2.87
Sigma	0.84	77.38
Dependent Variable: In the Labor Force		
Intercept	0.18	0.40
Black	0.00	-0.03
Male	0.52	13.54
Married	0.00	0.02
Age	0.01	0.98
Log Score	0.21	5.97
Log Highest Grade Attained	0.05	0.41
Family Size	-0.08	-5.49
In Poor Health?	-1.08	-21.85
Missing if Black	-0.17	-1.45
Missing Score	0.17	1.52
Rho	-0.81	-50.19
Number of Observations	5,977	
Log Likelihood	-7,759	

Table A3: Instruments for Labor Force Participation and Wage

Panel B: Spouse Labor Force & Wage

Parameter Estimates		
Parameter	**Estimate**	**t Value**
Dependent Variable: Log Spouse Wage		
Intercept	6.00	11.49
Respondent is Black	-0.20	-3.24
Respondent is Male	-0.21	-5.76
Log Spouse Age	0.23	1.83
Log Spouse Highest Grade	1.46	16.32
Family Size	0.07	5.10
Northeast Region	0.09	2.17
South Region	-0.08	-2.25
West Region	0.00	0.01
Urban Area	0.04	1.59
Missing if Black	-0.34	-2.99
Missing Score	-0.06	-0.65
Sigma	0.84	51.54

Dependent Variable: Spouse In the Labor Force		
Intercept	4.12	17.15
Respondent is Black	0.09	1.09
Respondent is Male	-0.95	-18.84
Log Spouse Age	-1.02	-10.82
Log Spouse Highest Grade	0.50	4.44
Family Size	-0.15	-7.89
Missing if Black	0.24	1.56
Missing Score	-0.05	-0.39
Rho	-0.84	-50.30
Number of Observations	5,977	
Log Likelihood	-4,261	

Table A4: Probability of Credit Impairment

Parameter Estimates		
Parameter	**Estimate**	**t Value**
Intercept	0.04	0.08
Black	0.15	2.53
Male	-0.02	-0.43
Married	-0.12	-2.41
Age	0.00	-0.18
Log Score	-0.03	-0.74
Log Highest Grade Attained	-0.33	-2.85
Family Size	0.01	0.35
In Poor Health - 2004?	0.09	1.20
In Poor Health - 2002?	0.23	3.23
Divorced in 2000?	0.10	0.91
Divorced in 2002?	0.38	3.57
Divorced in 2004?	0.32	2.95
Unemployed?	0.32	4.11
Missing if Black	-0.08	-0.66
Missing if Score	-0.06	-0.48
Missing 2000 Data	0.04	0.34
Missing 2002 Data	0.21	1.80

Number of Observations	5,977
Log Likelihood	-2,828