

## Homeownership Gaps Among Low-Income and Minority Households

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## **Abstract**

*While homeownership rates currently stand at historically high levels for all segments of the U.S. population, large gaps are present comparing various groups of the population. As of the third quarter of 2006, the non-Hispanic white homeownership rate was 76 percent while black and Hispanic homeownership rates were below 50 percent, and the Asian rate was 60 percent. The ownership gap between black and white households is larger in 2006 than 1990, while that between Hispanics and whites is only slightly smaller. Households with very-low income had a homeownership rate that was 37 percentage points below the rate for high-income households. These gaps have changed little over the last 50 years. The primary goal of this study is to synthesize what is known about the determinants of gaps in homeownership rates by income, racial, and ethnic status. We first present a conceptual framework for analyzing the determinants of homeownership. We then review the literature that identifies the relative importance of various contributing factors to observed homeownership gaps, separating the factors into those that are observed and those that are part of an unexplained residual that represents unmeasured factors such as discrimination, lack of information about the home buying and mortgage financing process, and omitted socio-economic variables.*

The primary goal of this study is to synthesize what is known about the determinants of gaps in homeownership rates by income, racial, and ethnic status. Our focus is on comparing non-Hispanic white ownership rates with those of blacks, Hispanics, and Asians. We first present a conceptual framework for analyzing the determinants of homeownership. This framework is used to identify which factors contribute to observed homeownership differentials. We then review the literature that identifies the relative importance of various contributing factors to overall observed homeownership gaps.<sup>1</sup> Homeownership gaps are separated into two components: one being the share of the gap that is explained by observed differences in socio-economic variables among income, racial, and ethnic groups, and the other being an unexplained residual that represents unmeasured factors that include discrimination, lack of information about the home buying and mortgage financing process, and omitted socio-economic variables. We report the consensus opinion about the size of each component and identify areas in need of further study.

## **Conceptual Framework of the Determinants of Homeownership Gaps**

What explains the differences in homeownership rates among households? Exhibit 1 describes our framework. We begin with a discussion of the role of household formation, an often overlooked factor in the discussion of gaps in homeownership rates. Next, the propensity for homeownership is separated into demand and supply factors. Under the category of demand factors, we discuss the user cost approach and the consumption-investment model of households' choice of whether to own or rent. Regarding the supply side, both the location of single family dwellings and mortgage market constraints may affect ownership rates.

[INSERT EXHIBIT 1 ABOUT HERE]

### **Household Formation**

Although often overlooked, differences in the propensity to form a household could contribute to gaps in homeownership rates. Factors contributing to differences in household headship rates include differences in marriage, divorce, and widowhood rates, differences in the typical age that a youth leaves the parental home, and differences in tendencies to reside in group quarters such as college dormitories and prisons. Our review of the literature finds that substantial changes in these factors have occurred during the last thirty years and substantial differences in headship rates are present comparing income, racial, and ethnic groups. We conclude that household formation is *potentially* very important to the explanation of why gaps in homeownership are present and how these gaps have changed, but the existing literature that measures the impact is sparse.

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<sup>1</sup> A review of homeownership gaps that focuses on Hispanics is Cortes et al. (2006).

We begin with some definitions. A housing unit is counted as owner-occupied if the owner lives in the dwelling unit. If the owner is absent and the unit is occupied, then the unit is counted as renter-occupied.<sup>2</sup> By definition, the number of households equals the total number of occupied housing units. A household includes all individuals living in a housing unit. Thus, a household may consist of an individual, a family, a group of unrelated individuals, multiple families, or mixtures of families and individuals living in the same housing unit. A housing unit is a separate living quarters with direct access to the outside through common halls. Group living units excluded from the count of housing units include institutionalized individuals in group quarters (nursing homes, prisons, mental hospitals) and non-institutionalized individuals in group quarters (students in a dormitory, military quarters, religious quarters). Thus, individuals living in census defined group quarters are excluded from the count of households.

Under these definitions, comparisons of homeownership rates among racial and ethnic groups and changes in ownership rates must be interpreted with care. For example, an increase in the homeownership rate occurs if the number of owners remains constant but the number of households shrinks. The number of households shrinks if two individuals living apart marry and live in a single dwelling, or if two individuals living apart double-up and share a single dwelling unit. If both households were renting prior to the move this change boosts the homeownership rate even if the new couple lives in a rental unit. If the couple chooses to own, the ownership rate is further increased. Differences in the rate of homeownership among various income or racial and ethnic groups could be explained, in part, by differences in the amount of doubling-up, marriage, divorce/separation, and living with parents or other relatives, or by the share of the population living in group quarters.

Theoretical insights about household formation are derived from both economic and sociological perspectives. Garasky et al. (2001) argue that blacks and Hispanics face discrimination in the housing market, limiting their choice of dwellings. Relative to white youths, this limitation may delay minority youth home-leaving and increase the likelihood that minority youths live in groups after leaving the parents' home. Haurin, Hendershott, and Kim (1993) argue that the cost of independent living is an important determinant of whether a youth leaves the parental home, where this cost is measured by the cost of both renting and home purchase in the locality. Ermisch and Di Salvo (1997) and Ermisch (1999) show that given empirically reasonable assumptions about the price elasticity of demand for housing, higher housing costs will lead youths to remain longer with their parents. Haurin, Hendershott, and Kim (1993) argue that the likelihood of a youth forming a household depends upon

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<sup>2</sup> For example, a two-family home (duplex) occupied in one unit by the owner and in the other by a renter has one owned unit and one rental unit.

a youth's ability to earn income as measured by his or her wage or income.<sup>3</sup> Garasky et al. (2001) extend this model to examine grouping-up versus living alone. They argue that the greater is a youth's income and the lower are housing prices, the higher the proportion of youths who will choose to live alone. These arguments suggest that youths with low earnings ability and youths living in high housing cost localities will tend to remain longer in their parents' home, and when they exit the parental home, will be more likely to live in groups. Both factors tend to reduce the headship rate for low-income and minority youths, where the headship rate is defined as the ratio of household heads to the total population.<sup>4</sup>

Another factor driving differences in headship rates are differences over time or among groups in the rates of marriage, partnering (defined as unmarried couples living together), and remarriage for a population of a given total size. Divorce, for example, creates two households from one, unless one of the individuals selects to live with an existing household (e.g., relatives, friends, or another partner). Marriage, in contrast, merges two households into a single unit.

A related factor concerns the definition of which individuals are included in the count of households as alluded to earlier. Individuals living in census designated "group living arrangements" are excluded from the count of households and thus from the calculation of the homeownership rate. If individuals move from living alone to a college dorm, military housing, or prison, the count of households falls. The homeownership rate will be affected unless the individuals happened to be drawn from the populations of owners and renters in exactly the same proportion as the ownership rate. This is highly unlikely as young adults are most likely to be drawn from the renter population. Racial differentials in rates of living in group arrangements could affect homeownership gaps.<sup>5</sup>

Hendershott (1987) studied the impact of household formation on the homeownership rate in the 1960-85 period. He reports that headship rates increased for all age categories. Also, there have been substantial changes in the age distribution due to the baby boom and subsequent baby bust that have impacted the overall U.S. headship rate. The impact of these changes in headship on the

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<sup>3</sup> Haurin, Hendershott, and Kim (1993) distinguish potential earnings from actual earnings because a youth's actual earnings depend on labor supply, a choice variable influenced by the living arrangement that is selected.

<sup>4</sup> Differences among groups in the average age of home-leaving also affect both the headship rate of the group and the propensity for homeownership. Earlier home-leaving by youths, for example, likely implies more renters, depressing the group's ownership rate. But earlier home-leaving may also lead to a higher incidence of grouping-up which would mitigate the impact of early home-leaving on the number of households associated with a given portion of the population.

<sup>5</sup> Data compiled by the Bureau of Justice Statistics (Beck and Harrison 2001) indicates that the rate of incarceration (Federal and State prisons) per 100,000 population increased by 77 percent from 1990 to 2000 and it is much higher for black males compared with white and Hispanic males, approaching 10 percent of the black male population for those ages 25 to 29.

homeownership rate was large. If age and the ownership rates of specific household types had remained constant from 1960 to 1985, the ownership rate would have fallen from 0.62 to 0.57. Instead, the observed ownership rate rose from 0.62 to 0.64 because of the substantial increase in average age and changes in the homeownership tendencies of specific household types (e.g., married couples). Hendershott does not analyze homeownership or headship rates by race, ethnicity, or income level, thus he sheds no light on our topic. However, his finding that the changes in household formation had an impact on the homeownership rate of 6.8 percentage points, holding constant the tendency to own a home for a family of given characteristics, shows the dramatic impact that changes in headship rates can have.

A recent study by Haurin and Rosenthal (2007) revisited this issue and found that while there were changes in headship behavior since 1970 and these changes affected homeownership rates, the net effects have been fairly modest. They found that black homeownership rates in 2000 would be roughly 3 to 5 percentage points higher if African Americans formed households as do white families, especially for individuals in their 20s and 30s. For Hispanic families the opposite holds: Hispanic homeownership rates would be 2 to 4 percentage points lower if Hispanic families formed households in a manner comparable to that of white families, with the largest impact again being for individuals in their 20s and 30s. Thus, controlling for headship behavior, white-black homeownership gaps are somewhat more severe than previously recognized, while the reverse is true for white-Hispanic gaps in homeownership, but these effects are modest relative to the size of the overall gaps.

### **User Cost and the Relative Cost of Owning to Renting**

The most common approach to model the tenure choice decision is the “user-cost” method. In this approach the relative cost of owning compared to renting is calculated and used as a key explanatory variable in a model of housing tenure choice (conditional on household formation). The relative cost can be interpreted as the cost to an owner-occupier of one dollar’s worth of housing in the rental market. For many owner-occupiers that cost is less than one because of expected home price appreciation and a variety of local and federal tax policies that implicitly favor homeownership. When the relative cost of owning is low relative to renting – holding constant the quality of the housing unit – households are more likely to become owner-occupiers. We characterize this method as a reduced form model because user cost studies typically do not distinguish between consumption motives for owning real estate versus investment-portfolio motives for owning the primary home. Early examples of the user cost approach include studies by Laidler (1969), Aaron (1970), and Rosen (1979). The user cost varies across households because of differences in multiple factors such as the effective marginal income tax rates (a measure of the sensitivity of the family to the favorable tax treatment of homeownership), the expected length of stay in the home which affects the discounted transactions cost of buying and selling real estate, maintenance and depreciation costs, and the expected appreciation on the home.

In the United States, homeowners are not taxed on imputed rent<sup>6</sup> from the dwelling and are allowed to deduct mortgage interest and property tax payments, but are not allowed to deduct maintenance expenditures. In contrast, landlords are taxed on their cash rent but are allowed deductions for mortgage interest, property taxes, and maintenance. Assuming competitive rental markets, tax provisions that favor landlords are passed on to tenants while owner-occupiers benefit directly from the favorable tax treatment of homeownership. On balance, Rosen (1979), King (1980), and others have shown that the net effect of these tax provisions is to subsidize the cost of homeownership relative to rental housing for many families. Using data from the 1981 American Housing Survey, Hoyt and Rosenthal (1990) estimate that the average cost to a U.S. owner-occupier of “one dollar” of housing is roughly 73.5 cents. Moreover, because the value of the favorable tax treatment of homeownership increases with the family’s marginal income tax rate, this figure differs across households.<sup>7</sup>

A second source of variation in the user cost of housing is the expected capital gain on the home. Historically, house price movements have been quite variable across regions. However, in the long run, efficiency in the real estate market would impose some discipline on these house price movements and ensure that risk adjusted rates of return would be similar across locations. But, over a shorter time horizon, it is likely that expected capital gains on housing differ across regions and cities. This would give rise to regional differences in the user cost of owner-occupied housing.<sup>8</sup> In principle, of course, capital gains benefit both landlords and, by extension, renters, as well as owner-occupiers. However, historically the tax code has treated capital gains more generously for owner-occupiers than for landlords.<sup>9</sup> As a result, higher expected capital gains likely reduce the user cost of owner-occupied housing, especially for families in higher tax brackets.

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<sup>6</sup> “Imputed rent” is the market value of the housing services consumed by the owner-occupant. It is imputed because the owner does not make any explicit payments for these services.

<sup>7</sup> Hoyt and Rosenthal (1992) assume that all owner-occupiers itemize and take advantage of deductions for mortgage interest and property tax payments. However, Follain and Ling (1991) show that many owner-occupiers do not itemize but instead take the standard deduction. For these households, owner-occupied housing is less heavily subsidized than the estimate reported above would suggest but likely is still less expensive than rental housing because of the failure to tax imputed rent.

<sup>8</sup> Studies by Case and Shiller (1989), Meese and Wallace (1994), and Rosenthal (1999) all find evidence consistent with the idea that over a short time horizon the possibility for arbitrage opportunities may exist in real estate markets, but over a longer time horizon such opportunities appear to disappear.

<sup>9</sup> Prior to 1986 homeowner capital gains were taxed at a rate equal to 40 percent of the family’s marginal income tax rate. In addition, families were allowed a one-time exemption from capital gains tax if they were over age 55. After 1986 homeowner capital gains were taxed at a rate

The above argument depends implicitly on the time horizon of the prospective owner-occupant, a horizon that in turn is sensitive to the anticipated length of stay in the home. Length of stay in the home also has a direct and powerful effect on the relative cost of owning to renting. Owner-occupiers incur substantial transactions costs when buying and selling their homes that are not incurred by renters. Realtors, for example, typically charge six percent of house value for their services. Add to this substantial legal fees, administrative costs, and taxes, and Linneman (1986) estimates that the cost of buying and selling a home is roughly 12 percent of property value. The discounted value of these transactions costs decline with length of stay in the home. Rosenthal (1988) formally incorporates these transactions costs into a user cost measure of owner-occupied housing and finds evidence consistent with the idea that transactions costs and tax-related costs have a similar influence on homeownership decisions.<sup>10</sup>

A number of other variations and modifications to the user cost of owner-occupied housing are present in the literature. Other economic and demographic variables are often included in the model in an ad hoc manner. All such studies, however, share certain features. First, they rely heavily on the tax code to generate variation across households in the relative cost of owning to renting. Second, investment motives for owning real estate are rarely taken explicitly into account. Some studies incorporate investment aspects in the user cost measure by including the opportunity cost of housing equity as the foregone return on alternative financial investments, but related dimensions of risk and uncertainty are largely ignored (exceptions include Chinloy 1991 and Hendershott 1997) . Instead, most user cost studies implicitly portray households as seeking the least expensive quality adjusted price for housing services, and in that respect, implicitly treat housing as a pure consumption good. A different approach to modeling the decision to own or rent the home is based on more explicit consideration of the investment aspect of housing.

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equal to the family's marginal income tax rate but marginal income tax rates were also lowered. The net effect however was a substantial increase in the typical tax rate on homeowner capital gains (see Hoyt and Rosenthal (1992)). Finally, beginning in 1998, the U.S. government effectively did away with the capital gains tax on homeowners of all ages for gains up to \$250,000 for single filers and \$500,000 for married couples filing joint returns.

<sup>10</sup> A number of studies have also assumed various values for the transaction costs of owners including Goodman (1995) – 5 to 10 percent of current income; Cunningham and Hendershott (1984) – 12 percent of house value; and Rosenthal (1988) – 7 percent of future house value, discounted to the present. Malatesta and Hess (1986) used a small sample to estimate that the average transaction cost of a relocating homeowner equals about 12 percent of house value. Haurin and Gill (2002) used a sample of military members and found that the transaction cost of selling a home is the sum of 3 percent of house value and 4 percent of household earnings. In addition, Shelton (1968) suggested that because of these transactions costs homeownership should be avoided if a household's planned length of stay in a dwelling is less than 3.5 years.

## Investment and Consumption Demands for Real Estate

We adopt a theoretical framework developed by Henderson and Ioannides (1983, 1987) that focuses on the interplay of investment and consumption demand for housing. If the investment demand for housing for a given family is large relative to consumption demand, the family could choose to own a home that satisfies its portfolio motives and rent out any remaining unwanted space (e.g. a basement suite, second house, etc.); in this case the family is financially better off if it owns. Alternatively, if a family's consumption demand is large relative to investment demand, for example when family size is large but the family believes house prices will decline, purchasing a home sufficient to satisfy the consumption needs of the family would constitute a bad investment. In this case the family is financially better off if it satisfies its consumption demand by choosing to rent its principal residence.<sup>11</sup> The Henderson-Ioannides model, while stylized, offers guidance in organizing the demand side of the literature on the determinants of housing tenure choice and homeownership gaps. On the consumption side, all of the usual determinants of consumer demand are likely to apply (e.g. family size, income, control and security of the dwelling, etc.) and thus need little elaboration. On the investment side, we noted above that there are a number of factors that affect the rate of return to housing investments such as the tax treatment, transaction costs, maintenance and depreciation, and the appreciation rate. Ioannides and Rosenthal (1994) find that investment demand is more sensitive to wealth and income than is consumption demand, while consumption demand is more sensitive to demographic variables and proximity to urban suburbs.<sup>12</sup> These last findings have particular implications when using the model to explain gaps in homeownership rates as will become apparent below.

An important component of the consumption-investment model is the inclusion of risk as an important factor in a household's tenure choice decision. The characteristics of the housing stock may vary across geographic locations in a manner that affects the risk and return on homeownership and resulting homeownership rates. The risk of substantial maintenance and renovation costs is greater in older housing (Emrath (1995, 1997)). This housing is typically located in inner city areas. Further, inner city areas tend to be populated by low income and minority households. Because low-income families are less able to absorb financial shocks such as catastrophic housing repair bills, they are less likely to prefer owner-occupation of housing located in inner city areas. There is evidence that the variance of house price changes is larger for houses with relatively low prices (Belsky and Duda (2002)), suggesting the risk of investment is greater for these houses. Because low-priced houses are mostly purchased by low-income households, the Henderson-Ioannides model suggests that this high

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<sup>11</sup> A graphical presentation of this model is contained in Herbert et al. (2005). A mathematical model and the resulting predictions are described in their Appendix A. A test of the model is contained in Ioannides and Rosenthal (1994).

<sup>12</sup> This differs from Arrondel and Lefebvre (2001) who find little difference in the determinants of the housing investment and consumption demand functions for France.

variance will deter the likelihood that these properties will be owner occupied. Sinai and Souleles (2005) suggest that owner-occupied housing provides implicit insurance against housing rent appreciation. Thus, in cities prone to bursts of housing rent appreciation – such as large cities with land supply constraints – a benefit of owner-occupied housing is the protection one gains against such effects. They find evidence to support the idea that cities subject to historically higher levels of housing rent volatility have higher homeownership rates for particular age groups. Among families under roughly age 40 there is no evidence of differences in homeownership rates in the two groups. However, beginning at about age 38, families living in high-volatility cities become increasingly likely to own relative to the low-volatility group, with the difference peaking at about 5 percentage points at age 68. Thereafter, differences diminish and disappear altogether by age 80.

Another factor that should matter in explaining the gaps in homeownership rates is household income. It is likely that investment demand rises with income faster than consumption demand, suggesting the likelihood of ownership will rise with income. Also, the tax advantages of ownership rise with household income. On average, black and Hispanic families have markedly lower income and thus we should expect that these minorities are more likely to be renters.<sup>13</sup> A related factor is income risk. Haurin (1991) found that households with high expected volatility of future income tend to rent even after controlling for other factors. Davidoff (2006) provided similar evidence by demonstrating that individuals with incomes closely tied to the local real estate market were less likely to be owner-occupiers, everything else equal. In addition, Rosenthal (2002) found that families that know what their income will be one year ahead are six percentage points more likely to own, while families in which the household head works full-time are ten percentage points more likely to own.<sup>14</sup> Together, results from these studies suggest that job stability and income security are important predictors of the demand for homeownership. Such behavior on the part of households is rational because a family with an uncertain income stream and/or insecure employment is likely to be more risk averse. Because housing is a potentially risky asset, homeownership is less appealing for such families. Moreover, given that black and Hispanic unemployment rates have been persistently higher than for comparable white households, these factors would clearly contribute to elevated homeownership rates of white families relative to those of minorities.

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<sup>13</sup> Black households tend to use the conventional mortgage market less so than whites: there is more use of “rent to own” and seller financing. Thus, although we know of no studies that quantify this claim, it is possible that the amount of formal mortgage interest paid by black households is lower than whites, *ceteris paribus*. The implication is that their tax advantage is lower, explaining part of the gap in ownership.

<sup>14</sup> These estimates were obtained using data from the 1998 Survey of Consumer Finances and were derived from a model that also controls for a host of household attributes as well as the influence of credit constraints and the density of development in the neighborhood.

Similarly, blacks and Hispanics are less wealthy than whites. While greater wealth likely increases both investment and consumption demand for real estate, it seems likely that increased wealth raises investment demand more than consumption demand and thus high wealth households are more likely to be owners.

Lower mobility implies that the transactions costs of owning a home can be spread out over a longer period. In the user cost framework, this reduces the per annum relative cost of owning compared to renting, increasing the likelihood of homeownership. Similarly, lower per annum transactions costs increase the rate of return on investing in owner-occupied housing, and that in turn increases investment demand. Accordingly, the investment-consumption model also predicts that lower mobility rates imply higher homeownership rates. Quigley (1987) reports that married households are less mobile than single-headed households. Moreover, as was noted previously, black households have a substantially lower marriage rate than white households. These differences contribute to differences in mobility rates by race and ethnicity. The one-year and five-year mobility rates for Hispanics are greater than for whites; the one-year rate for blacks is also greater than for whites, although the five-year rate is about the same (Haurin and Gill 2002; Schachter 2004; Herbert et al. 2005). On balance, both the user cost and investment-consumption models predict that lesser mobility among married and white households helps to explain higher rates of homeownership among white versus non-white families.

Both the user cost and investment-consumption models also suggest that expected house-price appreciation and capital gains should influence the likelihood of homeownership. Although the empirical literature about house-price appreciation is relatively well developed, few articles specifically focus on racial and ethnic differences in appreciation rates. The limited attention to racial and ethnic differences in house-price appreciation presumably reflects implicit assumptions that house-price appreciation rates are similar for white and non-white households. But in a discriminatory environment this may not be the case. Suppose, for example, that in-movement of minority families contributes to “white flight” from the local neighborhood because of discriminatory attitudes. Under these conditions, the arrival of minority households would reduce demand for housing in the neighborhood resulting in a decline in real property values (or lower rate of increase), *ceteris paribus*. On the other hand, limited housing supply for minority households could lead to greater sensitivity of house prices (at least in the short run) to variations in demand. For example, an influx of minority households to an inner city areas already populated by minorities could lead to a strong appreciation of house prices in these areas. Hispanic immigrants settling in predominately Hispanic areas of cities could have this effect.

Pollakowski, Stegman, and Rohe (1991), Badcock (1989), and Kiel and Carson (1990) find that low- and high-value homes have similar appreciation rates, with both higher than mid-valued houses. Li

and Rosenblatt (1997) argue that appreciation rates are likely to vary if the housing market is segmented, as may be true comparing housing in predominately white areas with other areas. Smith and Tesarek (1991), Delaney, Seward, and Smith (1992), Mayer (1993), and Smith and Ho (1996) find that property appreciation rates depend on the local economic climate. Mayer argues that high-price homes appreciate faster on average, but they also are more volatile. Smith and Ho (1996) find that lower-price houses are more likely to appreciate as interest rates fall and income and employment rise. Belsky and Duda (2002) study the period 1982-1998 and find that low-priced homes in Boston, Chicago, Denver, and Philadelphia had higher appreciation rates than middle- or high-priced homes. In summary, there appears to be no consensus in the above studies about whether house prices rise at the same rate for all homeowners.

There are only a few studies that focus on racial and ethnic differences in house-price appreciation. Coates and Vanderhoff (1993) find that the appreciation rates are similar for white and black households, controlling for MSA level variables such as population and real income growth rates. They use AHS data for 1974 to 1983, but they measure house-price appreciation only in two and three year periods because of data limitations. Kiel and Zabel (1996) also use AHS observations in three cities from 1975 to 1991 to study neighborhood level house-price appreciation. Comparing appreciation rates of black and white households, they find the results for Chicago, Philadelphia, and Denver differ greatly. Kim (2000) studies Milwaukee and uses 36,000 observations of property prices to measure house-price appreciation for 111 neighborhoods. Kim finds a non-linear relationship between percent minority and house-price appreciation, and in general, the greater is a neighborhood's minority population, the lower is its annual appreciation. The range is from 5.7 percent in an all white neighborhood (holding constant other factors at their mean values) to 1.5 percent in an all minority neighborhood. Kim also finds that annual house-price appreciation in the poorest neighborhood was 2.6 percentage points less than in the richest neighborhood. There is no breakout of the minority household category among blacks, Hispanics, and others. Both of Kim's major findings are relevant for our review. If minority and low-income households' homes appreciate at lower rates than other groups' homes, then their return on housing is relatively lower and their incentive to invest in owner-occupied homes is lower. This finding would suggest that at least part of the gap in homeownership is explained by a rational investment decision. The primary drawback of Kim's study is that it is specific to one metro area and the findings cannot be generalized to the national population. What is missing from the literature is an analysis of a national sample of house price changes at the neighborhood level for a multi-decade period. This analysis is needed to determine whether differing appreciation rates contribute to differing investment returns for owner-occupied housing by income or race-ethnicity. The current empirical literature suggests that black, Hispanic, and white households in particular cities should expect different rates of house-price appreciation, but the expectations are likely city and time-period specific.

## The Impact of Supply Side Determinants on Gaps in Homeownership Rates

The conceptual framework is completed by considering supply side factors that affect the ability of families to attain homeownership. We discuss three aspects of supply, the supply of mortgage credit, discrimination in mortgage markets, and the location of the supply of single family houses.

The supply of mortgage credit has a direct effect on the ability of most low-income and minority households to buy a home. We review studies that discuss whether lenders choose to impose a down payment or to ration mortgage credit through interest rates. The nature of the loan contract exposes lenders to default and late-payment risk. Under certain market conditions, lenders may respond by offering credit at below market clearing rates and then using credit scores to ration loanable funds to the lowest risk borrowers. We also review the many studies that provide empirical evidence on the extent and manner in which credit barriers restrict access to homeownership. An important finding from these studies is that borrowing constraints have impeded homeownership for younger families, minorities, and low-income households.

Partly in response to concerns about minority access to mortgage credit, beginning in the early 1990s a variety of very low down payment mortgage products became available through conventional lenders. Given that research has consistently found that a lack of wealth is a significant constraint to accessing mortgage financing, these loan products offered the possibility of raising homeownership rates. Despite these mortgage product innovations, the very low level of wealth among minority renters is still a cause of concern. Half of black and Hispanic renters in 1998 had close to zero net wealth.<sup>15</sup> For these families, even very low down payment mortgages will likely not be sufficient to make homeownership financially feasible. Moreover, these very low wealth families may rationally prefer to rent rather than subject themselves to the financial risks that go along with homeownership. Another recent change in the mortgage market is that risk-based pricing is becoming common, with subprime loans growing rapidly. Racial differentials in the use of subprime loans have engendered controversies about their net benefits.

A related set of studies provides evidence of racial discrimination in mortgage markets. Such discrimination provides a different but clearly important explanation for differential access to mortgage credit. Because minorities often are of lower income and wealth, and have less secure employment,

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<sup>15</sup> Low wealth among immigrant Hispanics also is affected by large remittance flows to relatives living in the immigrants' home country. For example, remittances to Central America doubled from \$1.8 billion in 1996 to \$3.6 billion in 2001, compared to an estimated \$2.0 billion in foreign direct investment and \$2.1 billion in official development assistance in 2001 (Inter-American Dialogue, 2004).

they may be subject to statistical discrimination in loan markets to the extent that lenders use race and ethnicity as predictors of hard-to-observe risk attributes. Such behavior is illegal in the mortgage market. Nevertheless, a number of studies have provided evidence of discrimination in mortgage markets.

Another supply side factor is the type of housing stock available in different neighborhoods. Single-family homes tend to be more conducive to owner-occupation relative to older, multifamily buildings. This could arise because of preferences for such housing among prospective homebuyers; that is, single-family housing and homeownership could be viewed by households as complementary goods. In addition, single-family housing does not typically entail common property issues. In contrast, in a multifamily building management and maintenance of common space and controls for noise and safety create administrative costs when organizing the units into condominiums suitable for homeownership. For these reasons, access to single-family housing may foster homeownership. We report evidence below that among middle- and higher-income households, racial and ethnic gaps in homeownership largely disappear after controlling for central city location and the type of structure in which the family resides (e.g. single family versus multifamily). Also documented is that minorities of all income levels are more likely to live in high-density central city housing relative to comparable white households.

### ***Credit Rationing***

Why might some mortgage lenders turn riskier customers away rather than set higher interest rates? Stiglitz and Weiss (1981) suggest that three things happen when lenders set higher interest rates: one of which is good for lenders, but the other two are potentially costly. First, higher interest rates increase the rate of return on a loan *provided* that the borrower pays the loan back in a timely manner. But with higher interest rates, borrowers with a strong predisposition to make timely loan payments will likely drop out of the pool of prospective loan applicants as they become concerned about their ability to pay the loan back. Borrowers who are more comfortable with the possibility of making late loan payments or even defaulting will remain. This adverse selection reduces the quality of the pool of prospective loan applicants. With limited information, it is difficult for lenders to distinguish “good” from “bad” loan applicants. In addition, with higher loan rates, higher expected capital gains must be earned to justify homeownership from an investment perspective. But asset market theory and related empirical studies provide compelling evidence that higher expected returns are accompanied by increased price volatility and risk. As a result, with high loan rates loan applicants have an incentive to invest in riskier housing knowing that their potential losses are truncated by their option to default. In this regard, higher interest rates contribute to borrower behavior that is costly to lenders, a phenomenon that is typically referred to as moral hazard. Because of adverse selection and moral hazard, it is likely that as loan rates increase, at some point the increased return on loan payments made in a timely manner will be offset by higher overall rates

of late payments and default. For these reasons, Stiglitz and Weiss (1981) argue that lenders may set loan rates below market clearing levels and use non-rate terms to ration the supply of credit in the face of excess demand for loanable funds.<sup>16</sup>

Of course, lenders do have sufficient information to group loan applicants at least partially on the basis of observable differences in credit risk. For example, lenders are able to distinguish between those loan applicants with a history of problems in paying their credit card bills on time versus those that have a clean credit history. In this instance, Stiglitz and Weiss (1981) suggest that lenders will charge higher interest rates to the less credit worthy group, in effect, pricing the perceived difference in risk directly through the interest rate.

Duca and Rosenthal (1994) argue that Fair Lending Laws and the threat of costly litigation create strong incentives for a given lender to offer similar loan rates to observationally distinguishable borrowers. They argue this behavior would be especially likely in cases where lenders felt that credit risk was correlated with politically sensitive characteristics such as race and ethnicity, sex, and age. Under these conditions, one might expect a sorting equilibrium to emerge in which different lenders specialize in loan applicants of different credit risk, for example, specialists in subprime lending. Then, although lenders specializing in a given risk classification would offer similar loan rates to all prospective applicants meeting those lenders' credit standards, the credit market as a whole would offer loan rates that differed across borrowers on the basis of default risk.

But other considerations may preclude such a sorting equilibrium. As an illustration, suppose that non-white loan applicants, on average, pose a higher degree of default risk than white applicants owing to differences in wealth, income, and credit history. If the sorting equilibrium above prevailed, some lenders would offer lower interest rates to a largely white pool of borrowers while other lenders would offer higher interest rates to a disproportionately non-white pool of borrowers. The political and legal obstacles to such differences in the racial and ethnic composition of borrowers across lenders could be large (Rehm (1991a, 1991b)). For example, in response to bad press and community pressure in the early 1990s, Bank of America, Chemical Bank and NationsBank announced plans to increase lending to non-whites in the midst of gaining approval for mergers with other banks. Moreover, Bank of America's merger was approved by the Federal Reserve Board conditional on meeting lending goals in poor neighborhoods (Thomas 1992, pg. A6).<sup>17</sup>

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<sup>16</sup> See Appendix B of Herbert et al. (2005) for a detailed discussion of this model.

<sup>17</sup> For a discussion of related issues in the subprime mortgage market see Bunce, Gruenstein, Herbert, and Scheessele (2001).

The discussion above is predicated on the idea that lenders treat observationally distinguishable borrowers differently in order to earn higher expected returns. In that regard, the above discussion satisfies definitions of “statistical” discrimination. Statistical discrimination occurs when lenders treat loan applicants less favorably on the basis of observable demographic attributes such as race and ethnicity or gender in situations where such traits are potential predictors of higher expected rates of late payments and default. As noted by Ladd (1998), in the mortgage and consumer loan market, statistical discrimination is illegal even though the expected return on pools of loans issued to two groups that differ on the basis of race and ethnicity or gender may differ (Yinger 1998; Ross and Yinger 2002).

Another change in mortgage markets over the last decade that has tended to reduce constraints imposed by conventional underwriting is the growth in subprime mortgage lending. Between 1993 and 2001 the number of loans reported in HMDA by lenders primarily engaged in subprime lending increased 10-fold, from 100,000 loans to over a million loans for refinancings and home purchase. Subprime loans provide borrowers an opportunity to obtain mortgage funding even if they have impaired credit, income levels that are low compared to their housing costs or total debt levels, or seek loan amounts that exceed the value of their home. Prior to the advent of subprime lending it was difficult for homebuyers or homeowners to find sources of mortgage financing if they failed to meet conventional underwriting guidelines. But while subprime lending increases borrowing opportunities for some households, borrowers face higher interest rates and fees to compensate lenders for the higher risks of these loans. Most subprime loans have been used to refinance existing mortgages, and so have not been used to spur increases in homeownership. But there has been fairly rapid growth in subprime loans for home purchase—particularly among minority homebuyers—which means these loans could potentially contribute to increases in homeownership rates. ACORN (2002) reports that 297,000 homebuyers in 2001 used subprime loans, including 70,000 black or Hispanic homebuyers. By 2001, subprime lenders account for a fairly significant proportion of home purchase loans for minorities. Among black homebuyers, 26 percent used subprime lenders, compared to 15 percent among Hispanics, and 7 percent among whites.

Although subprime lending activity among minorities has increased markedly in recent years, we should emphasize that it is not clear whether this represents an increase in the availability of mortgage financing or whether minorities are paying more than necessary for their loans. There is a wealth of anecdotal evidence that along with the growth in subprime loans has come an increase in predatory practices that take advantage of borrowers’ lack of familiarity with the mortgage market to charge fees and interest rates far in excess of that needed to offset risk (see, for example the joint report on predatory lending by HUD and the Treasury, 2000). In some cases, these loans also may be underwritten without regard to a borrower’s ability to repay the loan, thus making default and

foreclosure more likely. These predatory loans also include loan terms and conditions that limit borrowers' ability to get out of these problem loans. A number of studies have found that subprime lending appears to be disproportionately concentrated in black and Hispanic neighborhoods as subprime lenders have higher market shares among high-income minority areas than in low-income white areas (Scheessele 2002). In many instances, however, these studies suffer from a lack of information about credit risk that is needed to demonstrate that subprime lending is inappropriately concentrated in minority neighborhoods. An exception is a recent study by Calem, Gillen, and Wachter (2003) of lending in Chicago and Philadelphia. This study incorporated better measures of neighborhood credit risk and found that at least for blacks subprime lending shares are not fully explained by measures of risk at the neighborhood level.

Most studies of subprime mortgage lending have relied on HMDA data, with subprime loans identified indirectly based on the tendency of a given lender to specialize in subprime loans. These data lack information on borrowers' risk attributes and loan terms (and costs) that is needed to fully evaluate the nature of subprime lending. As a result, based on the limited evidence thus far, it is not clear whether the advent of subprime lending has had a positive impact on homeownership given the higher interest rates, fees, and foreclosure risk associated with these loans.

Mortgage lenders have traditionally required the buyer to contribute to the purchase of a home. The purpose of the down payment is to have the buyer share the risk of price fluctuations, to ensure that buyers have an incentive to maintain the property and to avoid the cost of a foreclosure. Masnick (2001) reports that loan-to-value ratios (LTVs) were relatively low in the early part of the 20<sup>th</sup> century, typically 50 percent in the late 1920s. In the 1930s, government-backed mortgages were developed and Fannie Mae came into existence. In the 1970s, the standard down payment was expected to be 20 percent of the purchase price, with selected exceptions. Throughout the 1990s, the minimal required down payment continued to fall. Freddie Mac introduced the Affordable Gold programs in 1992, consisting of a 5 percent down payment program. The Freddie Mac Affordable Gold 97 program further reduced the down payment requirement to 3 percent. Reductions of the down payment to 0 percent have also been achieved.<sup>18</sup>

The empirical literature presents convincing evidence that lack of wealth reduces the likelihood of attaining homeownership even if it is rational for the household to make the investment (Linneman and Wachter 1989; Zorn 1989; Duca and Rosenthal 1991, 1994a; Engelhardt 1996; Haurin, Hendershott, and Wachter 1997). A recent study by Rosenthal (2002) estimated the demand for

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<sup>18</sup> For example, Zero Down<sup>TM</sup> is an affordable mortgage product offered by Bank of America. In 1998 it was available in 23 states and Washington, DC. It is a conventional mortgage that requires zero down payment. In addition, closing costs can come from a gift or the seller, or can be financed (see Bank of America 1998).

homeownership controlling for the influence of credit barriers using data from the 1998 Survey of Consumer Finances. Central to the study are a set of survey questions that enabled the researcher to determine, a priori, whether the individual family perceives itself to have been subject to binding credit barriers of *any* type (mortgage, auto credit, consumer credit, etc.). Then, controlling for sample selection, Rosenthal (2002) estimated the demand for homeownership among families not subject to credit barriers and uses the results to predict the demand for homeownership for the entire sample. Comparing predicted to actual homeownership rates provides an estimate of the influence of credit barriers on homeownership. For the U.S. population as a whole, Rosenthal estimated that credit barriers depress homeownership rates by just over 4 percentage points. Among white households the estimate was 4.1 percentage points, among Hispanics 6.7 percentage points, and among blacks just 1.3 percentage points. Although sampling variation and the normal degree of imprecision in such estimates must be kept in mind, these estimates suggest that credit barriers account for little of the overall racial-ethnic gaps in homeownership. Moreover, given that Rosenthal's study provided only modest controls for credit history (specifically, the study controls for history of late loan and credit card payments and evidence of past bankruptcies), the possibility of omitted variables remains. But omitted household attributes almost always work in the direction of inflating estimated race related effects in the homeownership literature. These estimates, therefore, may provide an upper bound on the extent to which credit barriers exacerbate racial gaps in homeownership. Rosenthal also summarizes the influence of credit barriers on homeownership rates by income category. Among families in the upper half of the income distribution credit barriers have little or no discernible effect on homeownership rates. However, credit barriers depress homeownership rates by roughly 7 percentage points among individuals in 10<sup>th</sup> to the 50<sup>th</sup> income percentile, and 11 percentage points in the bottom income decile. To put these estimates in perspective, Rosenthal also reports that compared to households in the 3<sup>rd</sup> income quartile, homeownership rates for households in the bottom decile are 39.4 percentage points lower, those with income between the 10<sup>th</sup> and 25<sup>th</sup> percentile are 24.9 percentage points lower, and those in the 2<sup>nd</sup> quartile are 14.1 percentage points lower. Thus, although credit barriers may account for an important portion of the gap in homeownership rates between families in the 3<sup>rd</sup> and 2<sup>nd</sup> income quartiles, in general, something other than credit barriers appears to drive much of the difference in homeownership rates between high- and low-income households.

Why does Rosenthal (2002) find that the influence of credit barriers on homeownership rates is so "low", especially with respect to racial gaps in homeownership? One possibility is the dramatic innovations in the mortgage market that have occurred since the late 1980s. Rosner (2001) reports that in 1989 just seven percent of home mortgages were issued with LTVs in excess of 90 percent, but that frequency increased steadily through the 1990s. The increase in high LTV loans reflects the introduction of an entirely new set of mortgage products in the last decade. These loan opportunities

complemented the continued presence of longstanding low down payment mortgages issued through government insured programs such as the Federal Housing Administration (FHA).

How do down payment constraints affect racial and ethnic gaps in homeownership rates? Numerous studies using different data sets spanning multiple decades show that blacks and Hispanics have substantially lower wealth than whites (Haurin, Hendershott, and Wachter 1996; Lusardi, Cossa, and Krupka 2000; Herbert et al. 2005). This difference in wealth, combined with the existence of down payment constraints, likely contributed to the observed gaps in homeownership rates.

Another way that the down payment constraint affects homeownership is related to the spatial distribution of minority households compared to non-Hispanic whites. Minorities tend to disproportionately reside in the largest central cities relative to white households, and thus they are likely to pay a higher price for the same quality housing. This occurs because of the premium associated with proximity to the central business district and because house prices are positively correlated with metro area populations. These higher prices make it more difficult to accumulate the needed down payment and thus discourage renters from becoming homeowners.

This discouragement effect has been documented by Yoshikawa and Ohtake (1989) who used Japanese data and found that renters in areas with low land prices were more likely to save to become homeowners, but those in high cost areas were more likely to give up trying to become an owner and thus they effectively stopped savings. Also, Engelhardt (1994) found some evidence that high house prices discouraged renters from participating in a Canadian tax-advantaged plan designed to encourage households to save for their down payments. Haurin, Hendershott, and Wachter (2001) found that as constant-quality house prices increased, renters' savings initially rose, but then fell when house prices were very high. Their explanation for the reversal was that when house prices increased to high levels, renters' expectations of becoming homeowners fell.

As noted earlier, the down payment constraint has been weakened substantially in recent years but the homeownership gap has not decreased in the last decade. Possible explanations include 1) the impact of the wealth constraint was relatively small thus its elimination would have only a minimal effect (as suggested by Rosenthal (2002)), 2) the effect will take longer to work out as it takes a while for households to recognize the change in the market structure, 3) the number of white renters near the margin of becoming a homeowner was relatively large and thus relaxation of the down payment constraint increased the number of white owners substantially (e.g. moved ownership forward in the life cycle), while the number of black and Hispanic renters near the margin of ownership was smaller

compared to the number of inframarginal minority renters.<sup>19</sup> Thus relaxing the down payment constraint would increase the homeownership rate for all households, but not close the gap.

### ***Discrimination in the Mortgage Market***

We previously commented on statistical discrimination. A very different form of discrimination arises when lenders have a “taste” for discrimination. In this instance, lenders forgo profit-making opportunities in order to avoid doing business with a particular group of individuals, for example, minority loan applicants. This form of discrimination is illegal and also has been the subject of study. The most prominent approach used by studies in this area is to examine the accept-reject decisions on mortgage loan applications as a function of the characteristics of the loan applicants, including race and ethnicity. Munnell et al. (1996) is the most influential of these studies. Using HMDA data augmented with additional information on the attributes of the loan applicants, they found that after controlling for loan applicant characteristics, black mortgage applicants in Boston in the late 1980s were eight percentage points more likely to have their loan applications rejected relative to comparable white loan applicants. The Munnell et al. (1996) study has been subject to numerous critiques. In response, the authors made their data available to other researchers and subsequent exhaustive examination confirmed the essential features of their results (see Carr and Megbolugbe (1993) or Ladd (1998), for example). The broad consensus emerging from these efforts is that discrimination has been present in mortgage lending at least through the 1980s and is likely still present today (Yinger 1998).

Berkovec et al. (1998) found that African-American mortgage default rates were higher than white default rates after controlling for a variety of household attributes. Using Becker-type arguments (Becker 1971, 1993), the authors argued that this result was consistent with an environment in which lenders apply *less* restrictive credit standards to blacks and more restrictive standards to whites. In addition, the authors also took care to note that omitted variables could potentially account for their results. A study by Cotterman (2002) that replicates Berkovec et al.’s analysis but incorporates credit score measures finds that the inclusion of this variable generally renders the race effect statistically insignificant. Nevertheless, controversy stemming from the Berkovec et al. (1998) work became sufficiently energetic that an entire issue of *CityScape* (1997) was devoted to comments on the work and responses by Berkovec and his co-authors. At the core of the debate were concerns about how

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<sup>19</sup> In addition, if there were an offsetting decline in wealth held by minority households in the 1990s, the impact of new low down payment loans would be reduced. But this seems unlikely given the strong economy. A more realistic issue is that higher LTV ratios imply higher monthly mortgage payments and, thus, higher house payment to income ratios. Although lender standards on such ratios also were relaxed somewhat in the 1990s, for many families low down payment loans could imply debt service ratios that would be unappealing.

omitted variables possibly would confound interpretation of the outcome from default studies. Ladd (1998) summarizes the central issues in this debate well when she writes...

“... Working in one direction, the presence of the unobservable factors disproportionately increases the likelihood of blacks defaulting on any approved loan. Working in the other direction, taste-based or profit-motivated discrimination decreases the likelihood of default for blacks because fewer loans are approved to that group.”

In other words, omitted factors related to discrimination could serve to either increase or decrease black households' default rates relative to those of comparable white borrowers. For that reason, Ladd (1998) concludes that default studies are hampered by identification problems, but these problems are less severe in the context of accept-reject studies of mortgage applications such as Munnell et al. (1996).

### **Availability of a “Suitable” Housing Stock for Homeownership**

In 1975, Kain and Quigley (1975) suggested that because blacks were concentrated in inner-city neighborhoods, residential segregation constrained the type of housing stock available to black households and thus might serve to limit homeownership among inner-city minorities.<sup>20</sup>

In part, Kain and Quigley motivated the idea of supply constraints by drawing an analogy to the then recently developed notion of a spatial mismatch in which suburbanization of manufacturing jobs coupled with suburban housing market discrimination reduces employment opportunities for black households. In the context of homeownership, Kain and Quigley argued that single-family detached housing stock is more conducive to homeownership. Thus, if discrimination restricts access to single-family suburban neighborhoods, blacks will disproportionately locate in central cities. Because central city areas have higher levels of multifamily housing relative to the suburbs, restrictions on access to suburban neighborhoods could limit homeownership rates among minorities. Kain and Quigley provide support for this idea by demonstrating that differences between African-American and white homeownership rates are higher in metropolitan areas in which the central cities have a lower share of single-family housing stock. They also show that the share of black households living in the suburbs further reduces white-black gaps in homeownership rates, although this effect appears to not be as strong as the influence of the availability of central city single-family housing stock.

Both the original work by Kain and Quigley (1975) and more recent work by Herbert (1997) focus on a potentially provocative but also relatively little studied idea: constraints on access to the supply of

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<sup>20</sup> Evidence that there is discrimination in the housing market that restricts minorities' choices is contained in fair housing audit studies (Yinger 1986).

different types of housing (e.g., single-family versus multifamily) might contribute to the relatively low rate of homeownership. The purpose of this section is to review the conceptual foundation for these ideas. First, we briefly review well-established arguments for why low-income families concentrate in the central cities regardless of race or ethnicity. Next, we recognize that central cities exhibit higher land prices and as a result, a greater frequency of high-density residential and non-residential buildings. Discrimination and the historically low-income status of minorities together ensure that minority households will be segregated in central city locations, reducing proximity to single-family housing. The question then arises as to why this would necessarily reduce minority homeownership rates. Although it is beyond the scope of this study to answer that question, we speculate about some possible answers.

### ***Stratification of Households by Income***

A well-established principle in urban theory concerns the tradeoff between proximity to employment and house price. In the simplest economic model, all employment is located in the central city and residential locations differ only in their distance to the downtown. Assuming that households dislike long commutes, with competitive markets the prices of houses far from the central city fall to compensate for longer commutes and a spatial equilibrium is attained. In practice, this implies that the price per unit of housing is lower in the suburbs.<sup>21</sup> As shown by Muth (1969) the rate at which quality adjusted house prices decline with reduced proximity to employment centers is driven by the cost of commuting relative to housing demand. This model predicts that as incomes increase, if housing demand rises more quickly than marginal commuting costs, high-income families outbid low-income families for suburban sites suitable for larger homes with larger lots. On the other hand, grouping lower-income families together in multifamily structures, developers of high-density low-income housing can outbid high-income families for central city sites, even though such sites are close to the dominant employment center. Glaeser, Kahn, and Rappaport (2000) recently reexamined the idea that tradeoffs between commuting costs and housing demand lead to stratification of high- and low-income families into predominantly suburban and central-city locations. Using the American Housing Survey they present evidence that the income elasticity of demand for lot size is actually quite low. Unless the income elasticity of commuting costs is similarly low, they argue that some other phenomena must account for the concentration of low-income families in the central cities.<sup>22</sup> Upon further investigation, they argue that low-income families concentrate in the central cities at least in part to take advantage of public transportation essential for families with limited access to

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<sup>21</sup> More generally, employment can occur anywhere in the metropolitan area, but the principle still holds that with competitive markets land prices adjust to compensate for differential proximity to employment centers.

<sup>22</sup> Wheaton (1977) was the first to argue that the two effects identified by Muth offset each other and thus other factors determine locational choice.

automobiles. Glaeser, Kahn, and Rappaport (2000) also present evidence that central city services for the poor are more generous than services provided by suburban communities.

A third argument is markedly different; discrimination against minorities is present in the housing market (Turner et al. 2002). For example, “steering” by real estate agents could result in segregated neighborhoods. Given the low-income status of many urban minorities, it seems virtually certain that all three explanations help account for the continued concentration of low-income minority households in the central cities.

### ***Central Cities, Multifamily Housing, and Homeownership Rates***

The key question is whether the concentration of minority households in the central cities restricts minority homeownership rates. The “supply constraint” hypothesis posited by Kain and Quigley (1975) and Herbert (1997) argues that reduced minority access to single family detached housing lowers minority homeownership rates because homeownership and single-family housing are complements. On the other hand, given the low-income status of many minorities, it is entirely possible that central city minority households disproportionately rent because they prefer to do so, an outcome implied by the tenure choice model discussed earlier.

Using data from the 1999 American Housing Survey, we find that among high-income families there is almost no difference in homeownership rates by race and ethnicity among single-family detached dwellers regardless of location.<sup>23</sup> Nevertheless, the overall homeownership rate for high-income white households is nearly ten percentage points higher than for similar black and other minority high-income households. That difference is clearly driven by differences in the propensity to live in single-family detached housing, and more generally, to live in neighborhoods in which single-family detached housing is found. Among middle-income families racial and ethnic differences in homeownership are also quite modest after controlling for structure type and location, though not as small as for higher-income households. Among low-income families there are substantial racial and ethnic differences in homeownership rates across the board regardless of location and housing type.

What could be driving these patterns? Alba, Logan, and Stults (2002) report that “... middle-income suburban blacks live with many more whites than do poor inner-city blacks. But their neighborhoods are not the same as those of whites with the same socioeconomic characteristics ... middle class blacks tend to live with neighbors who are less affluent than they are ...” Suppose that lower-income inner-city neighborhoods are more subject to crime and other social ills. Such neighborhoods would likely be viewed as riskier places in which to invest in owner-occupied housing. Unless such risks were offset by sufficiently high expected returns, we would expect higher-income residents of such neighborhoods to exhibit lower homeownership rates than families of comparably high income in

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<sup>23</sup> Detailed tables are presented in Herbert et al. (2005).

middle- and upper-income neighborhoods. Thus, neighborhoods accessible to middle and higher-income inner-city minorities might be higher risk environments in which to invest in homeownership relative to neighborhoods available to white families of similar income. Returning to the tenure choice model earlier in this report, everything else equal, increased risk pushes down the housing investment demand function and reduces the likelihood that families would choose to become homeowners. The factors that cause the outcomes observed by Alba, Logan, and Stults (2002) could indirectly contribute to the observed racial gap in ownership rates. For example, the underlying causal factors could include minorities facing discrimination in the housing market or racial differences in the taste for neighborhoods.

A related issue is the process governing the organization of units within a multifamily building into a condominium arrangement. Suppose, for example, that there are administrative costs associated with the organization of multifamily buildings into condominiums. Consider also the role of within building neighborhood externalities and suppose that crime and noisy behavior is more prevalent in lower-income buildings than in higher-income buildings. Then owners of low-income rental units may prefer to own entire buildings rather than just single units. This would give property owners the ability to evict noisy or dangerous tenants. In contrast, in a multifamily condominium arrangement, owners of individual units would have less ability to police disruptive behavior within the building. This might lower demand for the site and reduce the return to property owners because of lower rents. But if crime and noise were less prevalent among occupants of middle- and higher-income multifamily buildings, then one would expect such buildings to be organized into condominiums at a higher rate.

### ***Empirical Studies of the Supply of Single-Family Housing and Homeownership Rates***

McDonald (1974) provided further evidence to support Kain and Quigley's supply restriction hypothesis. McDonald's goal was to decompose the shortfall in black homeownership rates attributable to discrimination into a portion related to a lack of housing available for homeownership and a portion related to blacks' inability to obtain mortgage financing. Using the 1965 Detroit Transportation and Land Use Survey, McDonald estimated a set of simultaneous equations for the choices of ownership and of occupying a single-family structure (including duplexes). McDonald argued that if a lack of single-family houses accounts for the entire shortfall in black homeownership, the coefficient on the race variable would be significantly different from zero only in the equation predicting structure type, and not in the equation predicting tenure, given structure type. His results suggested that of the total unexplained shortfall in black homeownership of ten percentage points, 5.5 points were related to lower occupancy of single-family structures by blacks, while the remaining 4.5 points were related to lower ownership of occupied single-family homes, attributed by McDonald to blacks' inability to obtain mortgage financing.

Working in the opposite direction, Flippen (2001a) provides evidence that is not consistent with the presence of a single-family housing supply constraint. He examined the impact of segregation in his analysis of the Health and Retirement Survey for 1991. Using five different measures of segregation for 64 metropolitan areas, he found mixed evidence that black and Hispanic ownership is lower the greater is segregation. Flippen included the percentage of old dwellings and the percentage single-family dwellings as explanatory variables, but neither was significant for blacks and only the percent single family was significant for Hispanics. Moreover, he noted that court ordered busing in the 1970s resulted in white flight in many central cities. One outcome of these events was an increase in minority access to the existing central-city stock of single-family dwellings as white families vacated such dwellings for the suburbs. Thus, court ordered busing would serve to relax constraints on the supply of single-family housing for minority households.

Another paper that also casts doubt on the presence of a single-family housing supply constraint is recent work by Deng, Ross, and Wachter (2003). Using 1985 data from the metropolitan version of the American Housing Survey for Philadelphia, the authors estimated nested multinomial logit models of housing tenure choice taking neighborhood location within the Philadelphia metropolitan area into account. The study did not find any evidence to support the idea that racial differences in location within the metro area affect homeownership. However, research by Herbert (1997) indicates that of the major cities in the U.S., Philadelphia has a much higher than typical concentration of single-family housing in the central city. Moreover, the original Kain and Quigley (1975) work emphasized that it is the combination of segregation in conjunction with a concentration of high-density central city housing that restricts homeownership opportunities for minorities. To the extent that Philadelphia is highly segregated but otherwise offers a plentiful supply of central-city single-family housing, then racial segregation in the Philadelphia housing market would not necessarily be expected to contribute to racial disparities in access to homeownership. Among the 50 metropolitan areas studied by Herbert, Philadelphia was among the areas with the smallest unexplained residual in white versus black homeownership rates. More generally, whether or not racial segregation in conjunction with high-density central city development patterns restricts minority homeownership remains an open question, an area in need of additional research.

## Racial Gaps in Homeownership Rates

Despite the gains made by minorities since the 1960s in both economic affluence and in legal protection from housing market discrimination, there has been little improvement in minority homeownership rates over the last thirty years relative to white homeownership rates.<sup>24</sup> Studies of

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<sup>24</sup> While the issue of homeownership differences across the income distribution also is an important issue, income has not been the primary focus of most work evaluating homeownership differences. As a result, this section primarily deals with the large literature that has analyzed the

racial and ethnic differences in homeownership rates can be characterized as identifying two broad categories of factors that contribute to minority households having a lower probability of homeownership. One category relates to differences between whites and minorities in a range of demographic and economic factors. The other category relates to unobserved variables that include discrimination and a lack of households' understanding the home buying and mortgage finance processes.

Early studies of homeownership gaps assumed that the factors influencing households to become homeowners were the same for minorities and whites and that both groups' behavioral responses to these factors were the same. The studies separated the gap into two components: that due to differences in endowments and an unexplained residual amount. In these studies, the magnitude of the residual shortfall in the probability of homeownership attributed to race rather than endowments ranged up to 20 percentage points depending on the time period and the sample. Subsequent studies dropped these restrictive assumptions and followed a more general technique to decompose the homeownership gap into effects due to differences in socio-economic variables and the residual amount.

Over time there has been a downward trend in the estimated size of the residual component of the white-minority homeownership gaps. Also, studies of newly formed households and recent movers found single digit gaps in homeownership once differences in endowment were taken into account. The decreasing size of the residual could occur because recent studies have used a more comprehensive set of socio-economic explanatory variables as the quality of data sets improved. Or, it could be due to a smaller impact of discrimination in the mortgage and housing market. The latter conclusion is consistent with the establishment and enforcement of a number of policies that monitor mortgage markets and brokerage services and that enforce fair housing laws. To date, most studies that have noted a decline in the residual component of the homeownership gap have attributed this change to reduced discrimination. However, it is also clear that researchers are now including more and better explanatory variables in their analyses, and thus reducing the size of the unexplained residual.

Current estimates of the residual gap appear to be in the range of five to ten percentage points. This remaining unexplained gap may be accounted for by potentially important explanatory variables that have not generally been captured by these studies, such as a household's expected mobility, credit history, income variability, willingness to take financial risks, and understanding of the home buying and mortgage finance processes. A few recent studies have "explained" the entire racial gap in homeownership. However, this finding should not be construed as providing evidence that existing

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causes of gaps in homeownership by race. Nonetheless, income is always one of the factors controlled for in these studies.

anti-discrimination laws are obsolete. Rather, it is possible that the intertemporal decline in and current modest-sized race-related residuals from homeownership gap studies result, at least in part, from government policies and oversight regarding discriminatory treatment in housing and mortgage markets. However, the degree to which current government legislation has helped to reduce the size of race-related disparities in homeownership is unknown.

A general criticism of existing studies is the lack of linkage between the theory of homeownership and the set of explanatory variables included in empirical studies of ownership gaps. This failure results in the omission of important concepts (e.g. income stability) and it complicates the interpretation of included variables. For example, age and marital status become proxies for expected mobility and income becomes a proxy for the tax benefits of homeownership. Further, theory suggests that the effects of variables such as income and its interaction with the tax code should have nonlinear effects. Few studies of gaps in homeownership allow for such nonlinearities.

Another general problem with the literature on homeownership gaps is that it trails advances that have been made in the study of the propensity of a given household to become a homeowner. Most current studies of when and whether households become homeowners adopt an intertemporal approach, using information on changes in household circumstances over time to predict future choices. In contrast, apart from the occasional use of permanent rather than current income, studies of homeownership gaps are typically silent regarding intertemporal aspects of homeownership and instead rely exclusively on current household attributes to predict tenure choice. In many cases, studies of gaps in homeownership appear to have not advanced very much beyond methods used in the 1970s to estimate the probability of homeownership. In contrast, studies of the likelihood that individual households become homeowners have used panel data and related econometric methods for two decades. While the homeownership literature recognizes that a household's current tenure status will affect its future housing tenure choices, there is little recognition of this intertemporal dependence in the homeownership gaps literature. The literature on the propensity for homeownership also recognizes that expectations of future events affect current tenure choice decisions, but again the gaps literature, in general, fails to take this point into account.

Two broad but compelling conclusions emerge from our review of the literature. First, *additional* efforts targeting discrimination in housing and mortgage markets and a lack of information about the home buying process are unlikely to narrow racial gaps in homeownership by more than five to ten percentage points. That in turn implies that future efforts to narrow aggregate white-minority gaps in homeownership should primarily focus on addressing the differences in household circumstances by race – including wealth, income, education levels, and marital status – these accounting for the large majority of the observed difference in rates. Indeed, that is the conclusion of a recent study by Gabriel and Rosenthal (2005) that examines the determinants of white/minority homeownership gaps from

1983 to 2001 using a common set of data (different years of the Survey of Consumer Finances), variables, and methods. In that regard, the fact that so much of the homeownership gap is attributable to the generally lower socioeconomic standing of minorities suggests that policies that address broader societal factors will be needed to close these gaps. Factors that are important to supporting homeownership but may fall outside the range of homeownership policies include enhanced job opportunities, job security, marital status, and household stability. Creating an environment conducive to financial and family security for minorities is a challenging task, but one that policy makers must grapple with if they are to substantially reduce current racial gaps in homeownership. A second conclusion from this review is that there are considerable opportunities for further research to expand our knowledge of the determinants of race-related and income-related gaps in homeownership.

### **Empirical Studies of Homeownership Gaps**

Among earlier empirical studies, the dominant method used to control for race-related effects was to include dummy variables for racial status (e.g. black, Hispanic, Asian). But more recently, a number of studies have begun to adopt a “decomposition” approach that follows methods originated by Oaxaca (1973) and Blinder (1973). Applying this method to housing tenure, homeownership models are estimated separately by race and the coefficients from one group are used to predict the behavior of other groups while also being compared to the actual homeownership rates in the population. This approach separates total differences in homeownership rates into an endowment effect due to differences in household characteristics and a residual effect due to unexplained differences in the group including discriminatory treatment in the market.<sup>25</sup> This approach is more general than simply including racial dummy variables because it implicitly includes an entire set of interactive variables that allow race to modify the influence of all other variables included in the model (e.g. income, age). The alternative dummy variable approach, in comparison, implicitly assumes that racial status shifts the propensity for homeownership by the same amount for all individuals belonging to a given race regardless of income, household composition, etc. Comparisons of results across decomposition and dummy variable studies should, therefore, keep these differences in mind.

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<sup>25</sup> More specifically, the decomposition process entails applying the estimated coefficients predicting white homeownership to the characteristics of black households. The average predicted probability of homeownership for all black households provides an estimate of the black homeownership rate assuming their choices were made in the same way as whites. Subtracting this estimated black homeownership rate from the overall white homeownership rate provides an estimate of the ‘endowment’ effect – that is, the difference in rates due to differences in household characteristics or endowments. The “residual effect” is the remaining difference between actual black homeownership rate and the overall black homeownership rate predicted using the white model. Also see Appendix C of Herbert et al. (2005).

### ***Studies Using the Dummy Variable Approach***

The first work to focus on homeownership gaps was Kain and Quigley (1972) who studied St. Louis. Controlling for a variety of demographic factors, they found that the likelihood of homeownership among black households was 8.8 percentage points lower than comparable white households when using a generalized least squares regression model.<sup>26</sup> Their control variables included income, education, job tenure, marital status, gender, age, household size, number of children, and prior housing tenure status. Clearly some of the household attributes thought to influence homeownership were omitted and are likely reflected by the race dummy variable. In addition, the race dummy may reflect the influence of supply-side constraints, such as restricted access to single-family neighborhoods and mortgage credit.

Roistacher and Goodman (1976) replicated Kain and Quigley's method using data from the 1971 Panel Study of Income Dynamics (PSID) for the 24 largest metro areas. They found that the race effect, as measured by a coefficient on a dummy variable for blacks in an ordinary least squares (OLS) regression model, ranged from 17.0 to 19.1 percentage points. Roistacher and Goodman also estimated a logit model using the same data. When evaluated at the sample means of other variables, the logit model yielded an even greater disparity in ownership associated with race of 26.3 percentage points. However, when Roistacher and Goodman (1976) studied a sample of recent movers, they found *no* difference in the likelihood of ownership by blacks or Hispanics. This study was the first to suggest that existing gaps would disappear over time as households relocate.<sup>27</sup>

Long and Caudill (1992) analyzed white-black differences in homeownership using the 1986 Current Population Survey. Their explanatory variables included permanent and transitory income, a measure of wealth derived by capitalizing income from investments, the fraction of income received from welfare, and dummy variables for age, employment status, veteran status, household size, the South region, central city location, and race. They omitted expected house-price appreciation, credit histories, mobility, income and job stability, and education. In addition, they deviated from most other

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<sup>26</sup> Substituting permanent for current income caused that racial gap to jump to 19.4 percentage points.

<sup>27</sup> A number of studies of homeownership conducted during the 1970s examined tenure decisions of recent movers in order to account for the lag between a decision to change tenure and when the change actually occurs given the high transaction costs associated with purchasing or selling a home. Kain and Quigley (1972), Ladenson (1978), and Silberman et al. (1982) examined the tenure choice of recent movers. It was assumed that recent movers more accurately reflected a household's optimal tenure choice, which was thought to be particularly important during a period when there were rapid changes in legal protections for minorities and prejudicial attitudes. In recent years it has become less common to focus only on recent movers, with the implicit assumption being that on average the temporary disequilibrium between a household's current and desired tenure does not bias overall findings about the factors determining tenure choice.

studies by restricting their sample to married couples and by excluding mobile homes. This makes it difficult to compare their results to those of other studies. Using the dummy variable approach they found that being black was associated with a 6.3 percentage point lower probability of homeownership.

Other studies using the dummy variable method include Krivo (1986) who used the AHS from 1981 to study the ownership gap between white and Hispanic households. She controlled for income, education, age, number of children, region, and urban location and found that Hispanics were ten percentage points less likely to own once controls were included for household socio-economic attributes. However, Hispanics are not a homogeneous group and the residual component of the gap varied substantially across sub-groups, equaling 26 percentage points for Puerto Ricans, 19 percentage points for Cubans, but only 4 percentage points for Mexican Americans.<sup>28</sup> Krivo attributed these gaps to location, discrimination that causes segregation (e.g. real estate agents and mortgage lenders), and she speculated that immigrant status and housing cost also could play a role. Unlike other studies employing dummy variables for race, Krivo also explored differences in the explanatory power of individual household attributes both between Hispanics and whites and across Hispanic subgroups. But she did not use the Oaxaca-Blinder method to decompose the total gap into part attributable to differences in endowments and an unexplained residual.

Haurin and Morrow-Jones (2007) used 2005 survey data from Columbus, OH and focused on the role of households' amount of information about the housing and mortgage market in their tenure decisions. They first estimated a standard model using typical explanatory variables (age, married, education, income, wealth, gender, immigrant status, and house price) and found a black-white residual of 15 percentage points. They then augmented the list of variables to include a measure of credit quality, the likelihood of moving, and a new measure of real estate market knowledge (all were statistically significant). The coefficient of the black dummy variable falls in value from 15 to 6 percentage points. Their final estimation that treats the real estate knowledge variable as endogenous further reduces the size of the dummy variable for blacks to 3.5 percentage points, and it is not statistically significant. What factors explain the total gap in homeownership rates? They find that both credit quality and information about the real estate market are important and each explains at least seven percentage points of the gap (the rest of the gap is explained by the standard set of explanatory variables). While this study is limited to one geographic area and considers only black-white comparisons of homeownership rates, its findings suggest that in the current housing market

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<sup>28</sup> A recent report that thoroughly reviews the differential ownership rates of Hispanics, by country of origin, is Cortes et al. (2006). They note that in 2000 the ownership rates varied from 60 percent for Spanish, to 58 percent for Cubans to 34 percent for Puerto Ricans, to 20 percent for Dominicans.

environment the impact of discrimination on the homeownership gap is minimal.<sup>29</sup> This study also emphasizes the importance of racial differences in the quantity of renters' information about the housing and mortgage markets and the role that this information plays in facilitating homeownership.

The role of information about the real estate and mortgage markets in tenure choice decisions also is emphasized in two studies that find that Hispanics are less likely to have accurate information about homeownership than other populations (Fannie Mae 2003; Lee, Tornatzky, and Torres 2004). This lack of understanding includes information about the home buying process, the importance of a person's financial history, and the mortgage qualification process. There also is evidence that Hispanics have a lower level of financial literacy and tend to distrust mainstream financial institutions (Congressional Hispanic Caucus Institute, 2004). The lack of a relationship with financial institutions leads some Hispanics to seek advice from informal sources such as a family member or friend or to rely on "cultural brokers" such as bilingual real estate agents, housing advocates, or lenders (Ratner, 1996). In some cases these advisors are not a good source of advice. Focus groups conducted in 11 cities throughout the country suggest that Hispanics are quick to trust "anyone who speaks their language and knows their community," but often these trusted sources were predatory lenders and real estate agents (Congressional Hispanic Caucus Institute, 2004).

Recent evidence suggests that many Hispanics have poor credit, which hinders their ability to become homeowners. In a recent study, Bostic et al., (2004) use data from the Survey of Consumer Finance (1989, 1995, 1998, and 2001 surveys) to assess the trends in credit quality across various segments of the U.S. population stratified by demographic characteristics, and they also quantify the extent to which credit quality constraints play an important role in a household's decision to pursue homeownership opportunities. The researchers identify an individual as constrained by credit if their score is below 660 (or the 25<sup>th</sup> percentile of the score distribution).<sup>30</sup> Overall, the study suggests that median scores across all individuals in the national sample increased from 721.3 in 1989 to 730.1 in

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<sup>29</sup> There continues to be evidence of incidents of discrimination in *both* the rental and homeownership markets (Ross and Yinger (2002)). Also, even when faced with discrimination in the real estate or mortgage market, a minority household could continue to search, eventually finding a nondiscriminatory agent or lender.

<sup>30</sup> The researchers had access to a data set that included credit scores and a variety of household characteristics. Using these data, they developed a statistical model to predict a credit score using household characteristics that were available in the Survey of Consumer Finance (SCF), including detailed information on assets and liabilities, use of financial services, income, housing status (renter and homeowner), and demographic characteristics (age, years of education, marital status, number of dependents, and race and ethnicity). They then applied the estimated model to SCF survey in each of the four years. The cutoff of scores below 660 to represent those who are credit constrained is based on the authors' review of information on the use of credit scores by mortgage lenders as reported by Fair Issac Corporation at [www.ficoguide.com](http://www.ficoguide.com).

2001. The percentage of individuals who are credit-constrained also increased slightly, from 19.3 percent to 24.5 percent during the study period. The median score among Hispanics decreased from 695 in 1989 to 670 in 2001. The proportion of Hispanics who fell below the 660-threshold increased significantly from 25.4 to 48.5 during the same time period. Moreover, these results are especially dramatic for Hispanic renters. The predicted score decreased significantly for Hispanic renters from 685.2 to 623.7, and the proportion of credit-constrained Hispanics increased dramatically from 20.5 percent to 63.3 percent. However, the study does not shed any light on the cause of these trends. Among the possibilities offered by the authors are that the increase in homeownership has creamed the highest credit quality renters among low-income and minority groups, deteriorating the average credit quality among remaining renters. The authors also speculate that changes in the characteristics of recent immigrants, who are more likely to be renters, may have contributed to the deterioration of credit quality among renters. Clearly, declining credit quality of minority renters will tend to keep ownership gaps at high levels.

### ***Studies Using the Oaxaca-Blinder Decomposition Approach***

Silberman, Yochum, and Ihlanfeldt (1982) argued that past discrimination might restrict current opportunities and decisions to own a home. In addition, they argued that older households are less likely to change their behaviors even if laws and discriminatory practices change, but that young households will respond to a changing environment. To examine these issues they evaluated homeownership probabilities for white and black households using PSID data for 1974 and 1978. Their primary approach was to estimate separate probit equations for blacks and whites and then statistically decompose the total racial difference in propensity to buy into a part related to differences in household characteristics and an unexplained residual. They found a large residual racial gap in ownership in 1974: 22.5 percentage points. But the race effect fell to 18.3 percentage points by 1978. In addition, they tested their hypothesis that new households will be more responsive to changes in their environment (e.g. new laws and less discrimination) by examining the propensity of newly formed households to become homeowners. Consistent with their arguments, the residual homeownership race effect was smaller for new households: 15.9 percentage points in 1974 and 8.2 percentage points in 1978. Based on the decline in race-related effects over their sample horizon they concluded that after 1974 the influence of discrimination on homeownership diminished.

Wachter and Megbolugbe (1992) applied a modeling approach developed by Goodman (1988) to the 1989 American Housing Survey. They included a large set of explanatory variables including measures of the relative cost of owning and renting, the expected appreciation in value of the occupied housing units, permanent and transitory income, as well as measures of race, age, marital status, and gender of the household head. They estimated separate models for blacks and whites and found a six percentage point lower rate of ownership for blacks, after controlling for household endowments and related socio-economic characteristics. This estimate is distinctive in that it is lower

than most previous studies using data from a roughly similar time period. They also estimated separate models for Hispanics and non-Hispanics and found that of a total difference in ownership rates of 40 percentage points, only 9 percentage points were unexplained by household attributes.

Myers and Chung (1996) focused on gaps in ownership among pre-retirement white and black households ages 51 to 62 using data from the Health and Retirement Survey (HRS). A distinctive feature of this dataset is that it includes information about households' tolerance for risk. The HRS also provides controls for a large number of other household variables including age, marital status, gender, number of dependents, income, education, health, religion, region, and a measure of cognitive ability. Not included in the Myers and Chung study were household wealth, mobility, expected house-price appreciation, and income and job stability. Bearing these features in mind, Myers and Chung find that having a longer planning horizon had a positive effect on ownership, while risk bearing preferences had no effect. Using the now standard decomposition of the gap in ownership, they found that the total 22.9 percentage point white-black gap was split into a 13.6 percentage point endowment component and a 9.2 percentage point discrimination and missing variables component.

Flippen (2001b) also used data from the 1991-92 Health and Retirement Survey to study racial differences in homeownership rates among whites, blacks, and Hispanics. He included data on inheritances, age, marital status, number of children, health, cognitive ability, education, income, occupation, self-employment, retirement status, number of prior layoffs, retirement status, expected years of life remaining, region, urban location, risk tolerance, and length of planning period. This list is the most comprehensive of all studies published through 2001 and it includes proxies for hard to measure concepts such as income uncertainty and risk aversion. Even with all of these controls, Flippen found that black and Hispanics were significantly less likely to be homeowners using the dummy variable approach. He then ran the equations separately and decomposed the 25 percentage point black-white gap in homeownership into the part due to differences in endowments (24 percentage points) and the residual (1 percentage point). Thus, the part of the gap due to discrimination or other omitted factors had shrunk to a very small amount. Flippen then further decomposed the impact of endowments into the effect of each explanatory variable by assessing the impact on the gap of substituting the mean for whites for a particular variable into the black equation. Among the endowments, the contributions to the black-white gap in order of importance were marital status, income, occupation, health, inheritances, and education. The gap in Hispanic-white homeownership was 27 percentage points, of which endowment differences explained 21 percentage points, leaving a residual component of 6 percentage points. Differences in income and employment characteristics were the most important endowment factors for Hispanics.

A number of studies have focused on explaining the Asian-white homeownership gap (Coulson 1999; Painter, Gabriel, and Myers 2001). Coulson (1999) used a national sample (1996 CPS) to explain white-Asian ownership and he found that all of the white-Asian difference in ownership could be explained by differences in age, location in high cost states, and immigrant status. Once all explanatory variables were controlled, Asians' ownership rate became greater than whites. Coulson and Kang (2001) and Painter, Yang, and Yu (2002) studied ethnic groups with Asian ethnicity. Coulson and Kang used CPS data from 1996 to 1999 and defined five areas of origin for Asians: Japan, People's Republic of China (PRC), Korea/Singapore/Hong Kong/Taiwan, Indian/Pakistan/Bangladesh, and "other Asian." Observed ownership rates ranged from 39 percent to 63 percent. Explanatory variables in the homeownership estimation included income, age, education, marital status, gender, the number of children, location (central city, suburban), the ratio of owner to renter prices, immigrant and citizenship status, and years in the U.S. This set of variables explained the ownership gaps quite well. Japanese, PRC, and "other" Asians observed ownership rates were about four percentage points higher than predicted. That for the Indian/Pakistan/Bangladesh Asians were about seven percentage points too low and the other combined group was about three percentage points too low.

Painter, Yang, and Yu (2002) used the five percent sample of the 1990 decennial census microdata and separated Asians into Chinese, Filipino, Japanese, Korean, Asian Indian, and "other Asians". Their sample was from three consolidated metropolitan areas: Los Angeles, San Francisco, and New York. These three areas contained about half of all Asians in the U.S. in 1990. Included as control variables in their explanation of homeownership were age, marital status, education, household size, permanent and transitory income, house prices and rental rates, immigrant status and duration of time in the U.S. Homeownership was estimated only for recent movers, creating the possibility of sample selection bias, this problem addressed by using the standard truncated bivariate model. One equation modeled the move-stay decision and the other modeled the ownership decision.

Using the decomposition method, they found that ethnic Chinese were 18 to 23 percentage points more likely to be homeowners than whites, *ceteris paribus*. Asian Indians also were more likely to own than whites in all three locations, but the differences were only 2 to 8 percentage points. Differences in ownership compared with whites of Filipinos and Koreans were small, with that for "other Asians" being 1 to 4 percentage points lower. Only Japanese in New York had a substantially lower ownership rate than comparable whites. They argued that this difference was due to many Japanese in New York being students or business employees on temporary assignments. Which explanatory variables were the most important in explaining the gap depends on the particular group. Immigrant status is important, suggesting that the white-Asian ownership gaps may close in coming decades as the recent large wave of immigrants is assimilated—although continued high rates of Asian immigration would serve to maintain the observed homeownership gaps.

### ***Studies That Estimate Trends in Homeownership Gaps***

Long and Caudill (1992) estimated a homeownership model using samples of married couples from the 1970 and 1980 decennial censuses and the 1986 CPS to provide an assessment of trends in unexplained white-black differences in homeownership. The results of their analysis suggest that race-related residual differences in homeownership rates declined over the 16 year period. They noted the 1970 black-white gap was 20.8 percentage points, and claim that it fell to 14.3 percentage points in 1986. Their measure of the total gap is lower than for all households because of the restriction of their sample to married couples and, perhaps, due to the comparison of census data with CPS data. They find that in 1970, 7.1 percentage points of the gap was due to racial differences (discrimination and other omitted variables), but this fell to 2.6 percentage points by 1986. They conclude that “housing market discrimination which restricts the opportunities for blacks to own homes is relatively unimportant today, at least for black households whose structure matches that of most white households (i.e. husband-and-wife households).”

Gyourko and Linneman (1997) compared changes in homeownership rates for blacks and other minorities between 1960 and 1990 to examine whether there were similarities in the experience of racial minorities in homeownership trends. Using census data, they showed that aggregate homeownership rates among non-black minorities increased about the same amount as that of black households between 1960 and 1970 and between 1980 and 1990. However, between 1970 and 1980 black homeownership increased by 3.2 points, while among other minorities homeownership declined by 0.6 points. The divergence of rates in the 1970s is due to multiple factors, but an important one is the difference in the composition of minorities in terms of share of natives and immigrants. In particular, the rate of immigration of non-black minorities was substantially larger than for blacks. Because recent immigrants tend to have relatively low ownership rates this difference in part explains the divergence in rates.

Gyourko, Linneman, and Wachter (1999) also examined changes over time in the effect of minority status on homeownership using the Surveys of Consumer Finance 1962, 1977, and 1983.<sup>31</sup> They report results for the typical white household and measured the impact of race by the change in the predicted probability of owning when race was changed to non-white. The results were reported for two different household types: wealth constrained and unconstrained. For households without a wealth constraint, minorities have a slightly *higher* predicted ownership rate (holding other variables constant). For wealth constrained households the shortfall in ownership due to race dropped sharply between 1962 and 1977, from 25 percentage points to 6 percentage points, and then rose to 12 percentage points in 1983. But a limitation of their study is that all minorities are grouped together which confounds efforts to interpret the findings. A changing composition of the minority population

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<sup>31</sup> This study is an extension of work by Linneman and Wachter (1989) that examines the importance of borrowing constraints in determining homeownership.

during 1962 to 1983 could account for the variation in estimates from the different years. For example, blacks far outnumbered other minority groups in 1962 but by 1983 the Hispanic and Asian population had grown considerably and included substantial numbers of recent immigrants. Gyourko, Linneman and Wachter (1999) concluded that, because there was little racial difference in the likelihood of homeownership among households not subject to a wealth constraint, discrimination was not an important explanation for racial differences in homeownership once differences in endowments were taken into account. Instead, they contended that racial differences in homeownership were largely due to differences in wealth. An important concern about this study, however, is that they treat wealth as exogenous even though the desire for homeownership has the potential to affect a family's level of wealth.

Bostic and Surette (2001) studied changes in ownership among whites, blacks, and Hispanics between 1989 and 1998, when the U.S. average homeownership rate grew by 2.3 percentage points (8 million households). Using CPS data, they focused on heads age 22 to 60, separated into five income categories. In 1989 the observed black-white gap was 28.8 percentage points, falling 2.0 percentage points by 1998. The gap fell by one percentage points for Hispanics. Bostic and Surette argued that the change in the ownership rate and the gaps could be due to one of three general factors: changes in household socio-economic characteristics, changes in the regulatory environment (Community Reinvestment Act, Home Mortgage Disclosure Act, HUD setting affordable housing goals for the GSEs), or technological developments, such as credit scoring. In 1989, the component of the black-white gap not attributable to the explanatory variables ranged from 9.8 to 16.9 percentage points depending on the income quintile. These gaps fell over the next decade by -0.6 to 6.0 percentage points, the reduction averaging 3.1 percentage points, somewhat larger than the change in the observed total gap. The comparable results for Hispanics were -0.1 to 4.4 percentage point reductions in the gaps, averaging 2.1 percentage points. There was no clear pattern of the size of the reduction in this residual gap with income category.

Collins and Margo (2001) studied changes in the homeownership gap between black and white male household heads age 20 to 64 over the 20<sup>th</sup> century. For their data set the gap decreased from 24.3 percentage points to 21.9 percentage points from 1900 to 1940. It then jumped to 27.3 percentage points in 1960, and subsequently fell to 19.6 percentage points in 1980 where it remained stable through 1990. They used an OLS model, estimated separately each census year, to explain homeownership including the following explanatory variables in the model: black, occupational status, age, literacy, farm, urban, suburban, region, marital status, family size, whether the household includes more than one family, native-born interregional migrants, and foreign born. Many sensible explanatory variables were omitted because of the limitations created by using census data, especially that from the early 1900s. The coefficient of the black indicator variable declined fairly steadily from 1900 to 1990 implying that unexplained factors causing the gap decreased in

importance over time. This insight is relatively powerful because Collins and Margo included the same list of explanatory variables in every census year regression. Their analysis suggests that the cause of the increase in the gap between 1940 and 1960 was mostly due to a change in the levels of the explanatory variables, particularly the level of urbanization of blacks (suggesting the importance of supply side effects). The rest of the change was due to changes in behavioral responses to the explanatory variables, particularly education. After 1960, only 40% of the reduction in the gap was explained by changes in endowments or behavioral responses, thus the majority of the reduction was due to unmeasured factors. They noted this finding is consistent with fair housing policies having an impact.

There are multiple limitations of the Collins-Margo study. First, the elimination of female-headed households from the sample, combined with the increase in the percentage of families that are female headed over time, masks substantial changes in the ownership rate. Clearly the overall ownership rate was pulled down after 1960 by the increase in the percentage of households that are headed by single females. The analysis was limited to households under age 65, a restriction that likely reduces the size of the gap because of the high ownership rate of heads age 65 or older and the longer average life span of whites. Finally, the list of variables omitted from the analysis is large.

Another study adopting the same wide sweep of time is by Masnick (2001). He included all households in the analysis, not just male heads age 20 to 64, and he found different trends than Collins and Margo during the 20<sup>th</sup> century, most importantly a much larger gap in 1980 and 1990. Masnick's most important contribution is noting the durability of the black-white gap for an age-specific cohort as the members age. For example, if the gap was particularly small for a cohort age 20-29 in year  $t$ , then the gap tends to remain small in years  $t + 10$ ,  $t + 20$ , etc. At any point in time, the total observed gap for a racial group is the weighted average of current age cohorts' gaps. Thus, given the tendency of gaps for specific cohorts to continue over time, trends in ownership rates and gaps depend on the gaps of the cohorts that are "exiting" the population and those that are entering the population.

Although research on the sustainability of homeownership is in its infancy, it is plausible that cohort specific gaps persist over time because current homeownership tends to increase the likelihood of future ownership. The implication is that if, for example, a public policy is implemented that increases the homeownership rate of young black households compared with whites, then this policy may impact the ownership gap not only during the implementation period, but also throughout these individuals' lifetimes. Further, and more speculatively, if there is intergenerational transmission of

tendencies to become a homeowner, there could be transmission of the impact of the public policy from one age cohort to their children.<sup>32</sup>

Gabriel and Rosenthal (2005) use data from the Survey of Consumer Finance to identify the factors associated with homeownership trends by race and ethnicity between 1983 and 2001. Their models control for household demographic characteristics and geographic location, but also incorporate information on whether the household is constrained in its access to credit. They find that roughly half of the homeownership average Hispanic gap over the period they studied was explained by available variables (14 percentage points out of a total gap of 30 percentage points). The remaining portion of the gap is attributable to factors not captured in their models, including immigrant status and discriminatory treatment. Gabriel and Rosenthal also examine white-black gaps in homeownership rates but find that the included variables in their models explain a much larger share of the observed differences compared to Hispanics. On average, the included variables accounted for 19 percentage points of the total gap of 26 percentage points. The larger unexplained Hispanic gap may well reflect the barriers faced by the large share of immigrants among Hispanics. Credit barriers account for no more than five percentage points of the remaining gap. This suggests that policy makers will need to look beyond innovations in mortgage finance if their goal is to further expand homeownership.

## Summary

Homeownership rates are by definition equal to the number of owner-occupying households in the population divided by the total number of households present. Thus, the propensity to form a household could contribute to racial, ethnic, and income related gaps in homeownership rates, but in a complicated manner. For example, we know that black marital rates are far lower than white marital rates. That difference serves to increase the number of black households relative to white households. But because single-headed households are typically more likely to rent, lower black marriage rates likely have a less than proportionate impact on the number of black homeowning families. Because black marital status likely increases the numerator in the homeownership rate calculation by less than the denominator, the influence of marital status on household formation likely lowers black homeownership rates relative to those of white households. More generally, our knowledge of the influence of household formation on homeownership gaps is in its infancy and requires further study.

Once a household is formed, what drives the decision to own versus rent a home? As a broad characterization, two conditions must be met in order for a household to become an owner-occupier. The family must *want* to own their home given their current financial and social status, and the family must be *able* to own a home. Because housing is a durable asset, demand for homeownership is

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<sup>32</sup> For supportive empirical evidence see Boehm and Schlottmann (1999).

sensitive to investment considerations and, therefore, is subject to all of the considerations and factors that influence a family's preferred portfolio. In that regard, families sensitive to financial risk, such as low-income households, are less likely to want to own a home, everything else equal. In addition, the return on homeownership is especially sensitive to household mobility given the very high transactions costs of selling an owner-occupied home relative to moving from a rental unit. Evidence reported in this chapter suggests that among renters, lower-income families are more mobile. This further implies that lower-income families will be less likely to want to own their homes. Additionally, the Federal tax code provides generous subsidies to homeowners by failing to tax imputed rent and allowing deductions for mortgage interest and property tax payments. But the benefits from such favorable tax treatment accrue disproportionately to higher income households with higher marginal income tax rates and a greater propensity to itemize. The tax code too, therefore, contributes to higher homeownership rates among high-income households relative to lower-income families. Because minorities are typically of lower income relative to white households, these considerations contribute to racial and ethnic gaps in homeownership rates as well. On the other hand, credible arguments and evidence in the literature suggests that constraints beyond the control of individual families *may* restrict access to homeownership for some households. Such "supply" constraints could arise in two different but related markets. First, in the housing market, a small number of studies have suggested that single-family housing is more conducive to homeownership. This link could arise because of preferences for such housing among prospective homebuyers – single-family housing and homeownership could be viewed by households as complementary goods. In addition, single-family housing does not typically entail common property issues. In contrast, in a multifamily building the management of common space and controls for noise and the like create administrative costs when organizing the units into condos suitable for homeownership. For these reasons, access to single-family housing may foster homeownership.

We note that minorities of all income levels are more likely to live in high density central city housing relative to comparable white households. There is obviously a correlation of spatial location and homeownership rates and the above argument suggests there could be a causal relationship. If there is causality, then to the extent that discrimination and related segregation in the housing market restricts minority access to single family neighborhoods, then segregation contributes to racial and ethnic gaps in homeownership. Further study of this issue is needed.

Restricted access to mortgage credit is a second explanation for why some families ready to become homeowners remain renters. Because minorities often are of lower income and wealth, and have less secure employment, they may be subject to statistical discrimination in loan markets to the extent that lenders use race and ethnicity as predictors of hard-to-observe risk attributes. Such behavior is illegal in the mortgage market. Nevertheless, a number of studies have provided evidence of discrimination in mortgage markets. Partly in response to concerns about minority access to mortgage credit,

beginning in the early 1990s a variety of very low down payment mortgage products became available through conventional lenders. The particular problem targeted was the very low level of wealth among minority renters. However, such families may rationally prefer to rent rather than subject themselves to the financial risks that go along with homeownership, even if it is obtainable with a low down payment loan. Thus, contrary to the beliefs of the early 1990s, very low down payment loans may not close the ownership gap.

The initial studies of the gap in ownership focused on black-white differences, the analysis later being expanded to include Hispanics and Asians. These early researchers assumed that the factors influencing households to become homeowners were the same for blacks and whites and that both groups' behavioral responses to these factors were the same. The studies separated the gap into two components: that due to differences in endowments and an unexplained residual amount. The magnitude of the residual shortfall in the probability of homeownership attributed to race rather than endowments has ranged over samples from about 5 to 20 percentage points. In general there has been a downwards trend over time. This trend could have occurred because recent studies have used a more comprehensive set of socio-economic explanatory variables as the quality of data sets improved. Or, it could be due to a smaller impact of discrimination (which is very difficult to observe directly) in the mortgage and housing market. This reduction of the residual also is consistent with the establishment over time of a number of policies that monitor mortgage markets and brokerage services and that enforce fair housing laws. To date, most studies that have noted a decline in the residual component of the homeownership gap have attributed this change to reduced discrimination. However, it is clear to us that researchers are now including more and better explanatory variables in their analyses. Some recent studies fully explain the gap in homeownership, suggesting that the effect of discrimination in the housing and mortgage market on the homeownership rate is now minimal.

## **Conclusions and Topics in Need of Further Research**

Two broad but compelling conclusions emerge from our review of the literature of racial, ethnic, and income related homeownership gaps. First, additional efforts targeting discrimination in housing and mortgage markets or targeting renters' lack of information about the home buying process are very unlikely to narrow racial gaps in homeownership by more than ten percentage points. This conclusion implies that future efforts to narrow aggregate white-minority gaps should primarily focus on addressing the differences in household circumstances by race and ethnicity – including wealth, income, and marital status – that account for a large majority of observed differences in homeownership rates. Some of these factors can be addressed by efforts to reduce barriers to homeownership associated with income and wealth (such as below market interest rate mortgages or low down payment programs). But the fact that so much of the homeownership gap is attributable to the generally lower socioeconomic standing of minorities suggests that policies that address broader

societal factors will also be needed to close these gaps over time. The factors that are important to supporting homeownership, but may fall outside the range of homeownership policies, include enhanced job opportunities, job security, and household stability. Creating an environment conducive to financial and family security for minorities is a challenging task, but one that policy makers must grapple with if they are to substantially reduce current racial gaps in homeownership.

A second conclusion from this review is that there are considerable opportunities for further research to expand our knowledge of the determinants of race-related and income-related gaps in homeownership. For example, while the stability of household income is understood to be an important determinant of homeownership, very little research has focused on the manner and extent to which employment and income stability affect both the demand for homeownership and constraints imposed on low-income and minority households. Studies in this area are needed to understand the extent to which some households rationally choose to rent when faced with an unstable flow of future income.

As the conceptual framework makes clear, the demand for homeownership is strongly influenced by the investment demand for housing. While this is well understood, there is a shortage of literature that examines how the investment returns from housing vary by income and race. For example, a household's expected length of stay will have a significant effect on the investment return from homeownership. But while there are many studies of household mobility, there are few that link differences in expected mobility by race and income to gaps in homeownership rates.

Variations in investment return by race may also contribute to racial gaps in homeownership rates. If house values increase less for homes owned by minority households than for white households, then the expected return from owning is reduced along with the propensity for homeownership. These concerns can arise when preferences for neighborhood racial composition give rise to tipping effects whereby in-movement of a discriminated group (e.g. blacks) prompts an exodus from the neighborhood (e.g. white "flight"), thereby reducing property values. Patterns of racial segregation may also limit housing appreciation in minority neighborhoods if few whites seek to buy homes in these areas. In contrast, if minorities face a limited spatial choice set for residential location and if there is an influx of minority households to predominantly minority neighborhoods, then house price appreciation rates could be relatively high. Research is needed to investigate the national picture of house price appreciation rates by race, ethnicity, and income and the role that this may play in reducing minority homeownership.

House price volatility is an important source of risk in homeownership. However, there are few studies that we are aware of that assesses the intertemporal variance of the price of low-priced homes and houses in areas primarily populated by minorities. Further study is needed to identify the degree of risk to which low-income families are exposed when they purchase low-priced homes.

Another issue that may differentially affect the financial risk and returns to homeownership for low-income households is the cost of home maintenance. It is well known that older housing is subject to higher levels of maintenance costs on average, and also a greater risk of potentially very high maintenance expenses. However, it is not known whether these factors contribute to income and race-related gaps in homeownership.

Also, while the impact of favorable tax treatment of homeownership on overall homeownership rates has been studied, the impact of favorable tax treatment on racial gaps in homeownership rates is in need of further study. The tax code is obviously a policy tool and its impact on the gap should be accounted for when modifications to tax laws are considered.

In general, studies of household decisions to own a home tend to be based on more advanced models than those of gaps in homeownership rates. For example, current theoretical and empirical models of household decisions to own a home often adopt an intertemporal optimization framework that recognizes the long-term nature of homeownership decisions. Further work is needed to adapt similar models to studies of gaps in homeownership rates.

Along these same lines, while the literature on household decisions to own a home recognizes that a household's current tenure status affects its future housing tenure choices, there is little recognition of this fact in the homeownership gaps literature. One consequence of the importance of past homeownership attainment on future tenure choices is that cohort specific gaps appear to persist over time. This observation is important for housing policy because programs that increase the homeownership rate of young minority and low-income households may have long-term effects throughout these individuals' lifetimes. But research on this topic is basically nonexistent.

Another intertemporal aspect of tenure choice suggested by several studies is the hypothesis that there is intergenerational transmission of the tendency to become a homeowner. Aside from the obvious transmission of wealth across generations, another possible motivation for such phenomena would be intergenerational transmission of information about both the benefits of homeownership and how to navigate the real estate brokerage and mortgage markets. If true, policies that close the white-minority homeownership gap may have a long-term effect by boosting the homeownership rate of the next generation of minorities. Hard evidence related to this idea is scant and implies the need for further study.

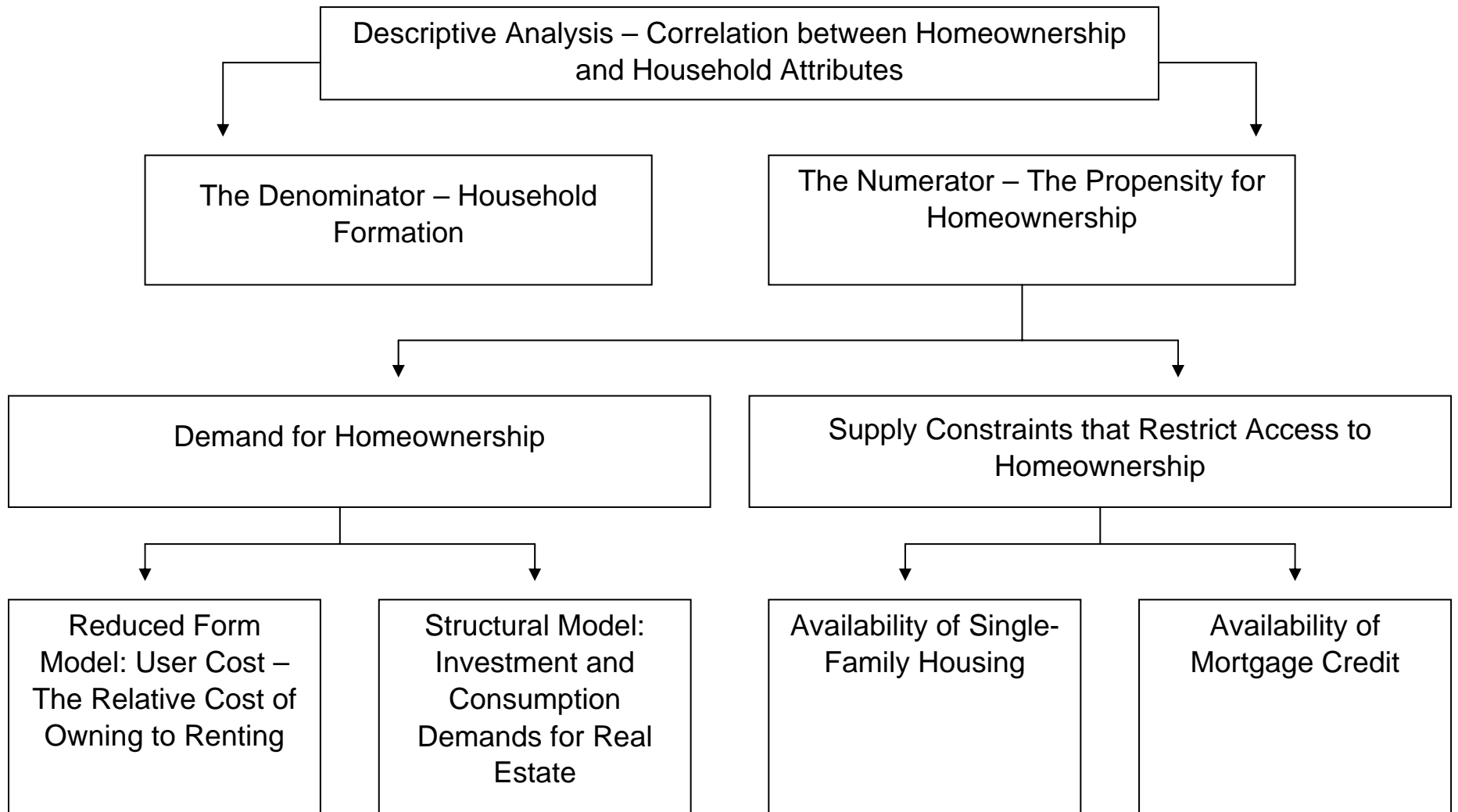
On the supply side, there has been a fair amount of research on the impact of mortgage finance barriers on homeownership. However, relatively little research has examined the impact of spatial limits on access to affordable and attractive homeownership options on low-income and minority homeownership rates. In the early 1970s, one study argued that racial segregation in conjunction with high-density central city housing restricted homeownership opportunities for minorities. Little attention

has been given to this issue since it was first proposed, despite the fact that residential segregation by race is still quite high in many areas. A related deficiency in the literature is the absence of any study that carefully documents the administrative costs associated with organizing multifamily buildings into condominiums. Are these costs higher if the tenants have low-income? Are they higher in localities with high crime rates or highly mobile households? How do these costs vary with the type of building and neighborhood? These issues have never been carefully researched but warrant further attention.

Another important supply side question is the role of manufactured homes as an affordable homeownership option. Units of this type comprise a large (8.2 percent) and growing share of the nation's owner-occupied housing stock and this sector has been one of the keys to homeownership growth in the 1990s. This growth in ownership of manufactured housing has been particularly strong for low-income and black households. This observation suggests that manufactured housing has a substantial role to play in explaining and helping to close homeownership gaps by race and ethnicity, particularly if financing issues for manufactured housing are addressed. Further study is needed of the profiles of new manufactured homeowners, the duration of ownership of manufactured housing, and what explains the differences in the likelihood of owning manufactured housing by different income, racial, and ethnic groups.

Finally, an important omission in the literature is the very limited amount of research that has sought to evaluate the effectiveness of specific homeownership policies. Policy makers therefore should consider including evaluation efforts as part of homeownership programs. Given the emphasis in policy circles on efforts to address wealth constraints and on education and counseling, these are two areas where evaluative research would be most beneficial.

## Exhibit 1: Conceptual Framework



## Bibliography

- Aaron, Henry. 1970. "Income Taxes and Housing," *American Economic Review* 60(5): 789-806.
- ACORN. 2002. "Separate and Unequal: Predatory Lending in America 2002," Washington, DC: ACORN.
- Alba, R. D., Logan, J. R., and B.J. Stults. 2000. "How Segregated Are Middle Class blacks?" *Social Problems* 47(4): 543-58.
- Arrondel, Luc and Bruno Lefebvre. 2001. "Consumption and Investment Motives in Housing Wealth Accumulation: A French Study," *Journal of Urban Economics* 50, 112-137.
- Badcock, B. A. 1989. "Homeownership and the Accumulation of Real Wealth," *Environment and Planning D* 7: 69-91.
- Bank of America. 1998. "Bank of America Launches First Ever Widely Available Zero Down Payment Mortgage." *Bank of America* news release, March 2.
- Beck, Allen J. and Paige M. Harrison. 2001. "Prisoners in 2000," Bureau of Justice Statistics Bulletin, U.S. Department of Justice. August.
- Becker, Gary. 1971. *The Economics of Discrimination*, 2<sup>nd</sup> Edition. Chicago, IL; University of Chicago Press.
- Becker, Gary. 1993. "The Evidence Against Banks Doesn't Prove Bias." *Business Week*, p. 18. April 19.
- Belsky, E.S. and M. Duda. 2002. "Asset Appreciation, Time of Purchase and Sale, and the Return to Low-Income Homeowners," in *Low-Income Homeownership: Examining the Unexamined Goal*, edited by N. Retsinas and E. Belsky. Brookings Institution Press: Washington, D.C.
- Berkovec, James A., Glenn B. Canner, Stuart A. Gabriel, and Tomothy H. Hannan. 1998. "Discrimination, Competition, and Loan Performance in FHA Mortgage Lending," *Review of Economics and Statistics* 80(2): 241-250.
- Blinder, Alan S. 1973. "Wage Discrimination: Reduced Form and Structural Estimates," *Journal of Human Resources* 18(4):436-455.
- Boehm, Thomas P. and Alan M. Schlottmann. 1999. "Does Homeownership by Parents Have an Economic Impact on Their Children?" *Journal of Housing Economics* 8: 217-232.
- Bostic, Raphael W. and Brian J. Surette. 2001. "Have the Doors Opened Wider? Trends in Homeownership Rates by Race and Income," *Journal of Real Estate Finance and Economics* 23: 411-434.

- Bostic, Raphael W., Paul S. Calem, and Susan Wachter. 2004. "Hitting the Wall: Credit as an Impediment to Homeownership," Joint Center for Housing Studies: Harvard University, Working Paper BABC 04-5.
- Bunce, Harrold, Debbie Gruenstein, Chris Herbert, and Randall Scheessele. 2001. "Subprime Foreclosers: the Smoking Gun of Predatory Lending? In *Housing Policy in the New Millennium Conference Proceedings*, edited by Susan M. Wachter and R. Leo Penne. Washington, DC: U.S. Department of Housing and Urban Development.
- Calem, Paul S., Kevin Gillen, and Susan Wachter. 2003. *The Neighborhood Distribution of Subprime Mortgage Lending*. Paper presented at the Annual Meeting of the American Real Estate and Urban Economics Association, January 2003, Washington, DC.
- Carr, James, and Isaac Megbolugbe. 1993. "A Research Note on the Federal Reserve Bank of Boston Study on Mortgage Lending." Federal National Mortgage Association, Office of Housing Research, Washington, DC. Photocopy.
- Case, Karl E. and Robert J. Shiller. 1989. "The Efficiency of the Market for Single Family Homes," *American Economic Review* 79: 125-137.
- Chinloy, Peter. 1991. "Risk and the User Cost of Housing Services," *AREUEA Journal* 19: 516–31.
- Coates, Douglas and James Vanderhoff. 1993. "Race of the Homeowners and Appreciation of Single-family Homes in the United States." *Journal of Real Estate Finance and Economics* 7: 205-212.
- Collins, William J. and Robert A. Margo. 2001. "Race and Home Ownership: A Century-Long View," *Explorations in Economic History* 38, 68–92.
- Congressional Hispanic Caucus Institute. 2004. Focus Group Findings: Cross-Site Report. Prepared by Mosaica: The Center for NonProfit Development and Pluralism. Washington, DC.
- Cortes, Alvaro, Christopher E. Herbert, Erin Wilson, and Elizabeth Clay. 2006. "Improving Homeownership Opportunities for Hispanic Families: A Review of the Literature," Abt Associates, Inc. report.
- Cotterman, Robert F. 2002. "New Evidence on the Relationship Between Race and Mortgage Default: The Importance of Credit History Data." Washington, DC: U.S. Department of Housing and Urban Development.
- Coulson, N. E. 1999. "Why Are Hispanic and Asian-American Homeownership Rates So Low?: Immigration and Other Factors," *Journal of Urban Economics* 45:209-227.
- Coulson, N. E. and M. Kang. 2001. "The Heterogeneity of Asian-American Homeownership," Department of Economics, Pennsylvania State University. Working paper.
- Cunningham, D. F. and P. H. Hendershott. 1984. Pricing FHA Mortgage Default Insurance, *Housing Finance Review* 3: 373-392.
- Davidoff, Thomas. 2006. "Labor Income, Housing Prices, and Homeownership," *Journal of Urban Economics* 59: 209-235.

- Delaney, Charles J., J. Allen Seward and Marc T. Smith. 1992. "An Empirical Analysis of Housing Price Appreciation in a Market Stratified by Size and Value of the Housing Stock," *Journal of Real Estate Research* 7:195-205.
- Deng, Yongheng, Stephen L. Ross, and Susan M. Wachter. 2003. "Racial Differences in Homeownership: The Effect of Residential Location," *Regional Science and Urban Economics* 33(5): 517-556.
- Duca, John V. and Stuart S. Rosenthal. 1991. "An Empirical Test of Credit Rationing in the Mortgage Market," *Journal of Urban Economics* 29: 218-234. March.
- Duca, John and Stuart Rosenthal. 1994a. "Borrowing Constraints and Access to Owner-Occupied Housing," *Regional Science and Urban Economics* 24: 301-322.
- Duca, John and Stuart Rosenthal. 1994b. "Do Mortgage Rates Vary Based on Household Default Characteristics? Evidence on Rate Sorting and Credit Rationing," *Journal of Real Estate Finance and Economics* 8(2): 99-113.
- Emrath, Paul. 1995. "Operating Costs of New and Existing Homes," *Housing Economics*, National Association of Home Builders, July: 5-8.
- Emrath, Paul. 1997. "Home Vintage and Operating Costs," *Housing Economics*, National Association of Home Builders, November: 5-8.
- Engelhardt, Gary V. 1994. "House Prices and the Decision to Save for Down Payments," *Journal of Urban Economics* 36: 209-237.
- Engelhardt, Gary V. 1996. "Consumption, Down Payment, and Liquidity Constraints," *Journal of Money, Credit, and Banking* 28: 255-271.
- Ermisch J. 1999. "Prices, Parents, and Young People's Household Formation," *Journal of Urban Economics* 45: 47-71
- Ermisch J. and P. Di Salvo. 1997. "The Economic Determinants of Young People's Household Formation," *Economica* 64: 627-644.
- Fannie Mae, 2003. *Understanding America's Homeownership Gaps: 2003 Fannie Mae National Housing Survey*. Washington, DC: Fannie Mae.
- Flippen, C. A. 2001a. "Racial and Ethnic Inequality in Homeownership and Housing Equity." *The Sociological Quarterly* 42:121-149.
- Flippen, C. A. 2001b. "Residential Segregation and Minority Home Ownership," *Social Science Research* 30: 337-362.
- Follain, James R. and David C. Ling. 1991. "The Federal Tax Subsidy to Housing and the Reduced Value of the Mortgage Interest Deduction." *National Tax Journal* 44: 147-168.
- Gabriel, Stuart, and Stuart Rosenthal. 2005. "Homeownership in the 1990s: Aggregate Trends and Racial Disparities," *Journal of Urban Economics* 57(1): 101-127.

- Garasky, Steven, R. Jean Haurin, and Donald R. Haurin. 2001. "Group Living Decisions as Youths Transition to Adulthood," *Journal of Population Economics* 14: 329-349.
- Glaeser, Edward, Matthew E. Kahn, and Jordan Rappaport. 2000. "Why do the Poor Live in Cities?" NBER Working Paper No. 7636.
- Goodman, Allen C. 1988. "An Econometric Model of Housing Price, Permanent Income, Tenure Choice, and Housing Demand," *Journal of Urban Economics* 23: 327-353.
- Goodman, Allen. 1995. "A Dynamic Equilibrium Model of Housing Demand and Mobility with Transactions Costs," *Journal of Housing Economics* 4: 307-327.
- Gyourko, Joseph and Peter Linneman. 1997. "The Changing Influences of Education, Income, Family Structure, and Race on Homeownership by Age over Time." *Journal of Housing Research* 8: 1-25.
- Gyourko, Joseph, Peter Linneman and Susan Wachter. 1999. "Analyzing the Relationship Between Race, Wealth and Homeownership in America," *Journal of Housing Economics* 8: 63-89.
- Haurin, Donald R. 1991. "Income Variability, Homeownership, and Housing Demand," *Journal of Housing Economics* 1(1): 60-74.
- Haurin, Donald R. and H. Leroy Gill. 2002. "The Impact of Transaction Costs and The Expected Length of Stay on Homeownership," *Journal of Urban Economics* 51: 563-584.
- Haurin, Donald R., Patric H. Hendershott and Dongwook Kim. 1993. "The Impact Of Real Rents And Wages On Household Formation," *Review of Economics and Statistics* 75: 284-293.
- Haurin, Donald R., Patric Hendershott, and Susan Wachter. 1996. "Wealth Accumulation and Housing Choices of Young Households: An Exploratory Investigation," *Journal of Housing Research* 7: 33-57.
- Haurin, Donald R., Patric Hendershott, and Susan Wachter. 1997. "Borrowing Constraints and the Tenure Choice of Young Households," *Journal of Housing Research* 8: 137-154.
- Haurin, Donald R., Patric Hendershott, and Susan Wachter. 2001. "Expected Homeownership and Real Wealth Accumulation," Working Paper, Department of Economics, Ohio State University.
- Haurin, Donald R. and Hazel Morrow-Jones. 2007. "The Impact of Real Estate Market Knowledge on Tenure Choice: A Comparison of African American and White Households," *Housing Policy Debate* forthcoming.
- Haurin, Donald R. and Stuart Rosenthal. 2007. "The Influence of Household Formation on Homeownership Rates across Time and Race," *Real Estate Economics* forthcoming.
- Hendershott, Patric H. 1987. "Household Formation and Homeownership: Impacts of Demographic, Sociological, and Economic Factors," *Housing Finance Review* 7: 201-224.
- Hendershott, Patric H. 1997. "Uses of Equilibrium Models in Real Estate Research," *Journal of Property Research* 14: 1-13.

- Henderson, J. Vernon and Yannis Ioannides. 1983. "A Model of Housing Tenure Choice," *American Economic Review* 73: 98-113.
- Henderson, J. Vernon and Yannis M. Ioannides. 1987. "Owner-Occupancy: Investment vs. Consumption Demand," *Journal of Urban Economics* 21: 228-241.
- Herbert, Christopher E. 1997. *Limited Choices: The Effect of Residential Segregation on Homeownership among Blacks*. Ph.D. dissertation, Harvard University.
- Herbert, Christopher E., Donald R. Haurin, Stuart S. Rosenthal, and Mark Duda. 2005. "Homeownership Gaps among Low-Income and Minority Borrowers and Neighborhoods," Washington, DC: Department of Housing and Urban Development. <http://www.huduser.org/publications/HOMEOWN/HGapsAmongLInMBnN.html>.
- Hoyt, William and Stuart Rosenthal. 1990. "Capital Gains Taxation and the Demand for Owner-Occupied Housing," *Review of Economics and Statistics* 72: 45-54.
- Hoyt, William and Stuart Rosenthal. 1992. "Owner-Occupied Housing, Capital Gains, and the Tax Reform Act of 1986," *Journal of Urban Economics* 32: 119-139.
- Inter-American Dialogue. 2004. All in the Family: Latin America's Most Important International Financial Flow. Task Force on Remittances, January.
- Ioannides, Yannis M. and Stuart S. Rosenthal. 1994. "Estimating the Consumption and Investment Demands for Housing and Their Effect on Housing Tenure Status," *Review of Economics and Statistics*: 127-141.
- Kain, John F. and John M. Quigley. 1972. "Housing Market Discrimination, Homeownership, and Savings Behavior," *American Economic Review* 62: 263-277.
- Kain, John F. and John M. Quigley. 1975. "Housing Markets and Racial Discrimination: A Microeconomic Analysis," Columbia University Press, New York.
- Kiel, Katherine A. and Jeffrey E. Zabel. 1996. "House Price Differentials in U.S. Cities: Household and Neighborhood Racial Effects," *Journal of Housing Economics* 5: 143-165.
- Kiel, Katherine A. and Richard T. Carson. 1990. "An Examination of Systematical Differences in the Appreciation of Individual Housing Units," *Journal of Real Estate Research* 5: 301-317.
- Kim, Sunwoong. 2000. "Race and Home Price Appreciation in Urban Neighborhoods: Evidence from Milwaukee, Wisconsin," *The Review of Black Political Economy* 28(2): 9-28.
- King, Mervyn. 1980. "An Econometric Model of Tenure Choice and Demand for Housing as a Joint Decision," *Journal of Public Economics*, 14: 137-159.
- Krivo, Lauren J. 1986. "Home Ownership Differences between Hispanics and Anglos in the United States," *Social Problems* 13: 319-335.
- Ladd, Helen. 1998. "Evidence on Discrimination in Mortgage Lending," *Journal of Economic Perspectives*, 12(2), 41-62.

- Ladenson, Mark L. 1978. "Race and Sex Discrimination in Housing: The Evidence from Probabilities of Homeownership," *Southern Economic Journal* 45(2): 559-575.
- Laidler, David. 1969. "Income Tax Incentives for Owner-Occupied Housing" in: *The Taxation of Income From Capital*, Arnold C. Harberger and Martin J. Bailey, eds., Brookings Institution, Washington DC, 50-76.
- Lee, Jongho, Louis G. Tornatzky, and Celina Torres. 2004. "El Sueño de Su Casa: The Homeownership Potential of Mexican-Heritage Families," The Tomás Rivera Policy Institute. University of Southern California.
- Li, Y. and E. Rosenblatt. 1997. "Can Urban Indicators Predict House Price Appreciation?" *Real Estate Economics* 25: 85-101.
- Linneman, Peter D. 1986. "An Empirical Test of the Efficiency of the Housing Market," *Journal of Urban Economics* 20: 140-154.
- Linneman, Peter D. and S. M. Wachter. 1989. "The Impacts of Borrowing Constraints on Homeownership," *AREUEA Journal* 17: 389-402.
- Long, James E. and Steven B. Caudill. 1992. "Racial Differences in Homeownership and Housing Wealth, 1970-1986," *Economic Inquiry* 30: 83-100.
- Lusardi, Annamaria, Ricardo Cossa, and Erin L. Krupka. 2000. "Savings of Young Parents," Working paper 2000-23, Federal Reserve Bank of Chicago.
- Malatesta, P. H. and A. C. Hess. 1986. "Discount Mortgage Financing and Housing Prices," *Housing Finance Review* 5: 25-41.
- Masnick, George S. 2001. "Home Ownership Trends and Racial Inequality in the United States in the 20<sup>th</sup> Century." Working Paper W01-4, Joint Center for Housing Studies: Harvard University.
- Mayer, Christopher J. 1993. "Taxes, Income Distribution, and the Real Estate Cycle: Why All Houses Do Not Appreciate at the Same Rate," *New England Economic Review* May/June: 39-50.
- McDonald, John F. 1974. "Housing Market Discrimination, Homeownership, and Savings Behavior: Comment," *American Economic Review* 64: 225-229.
- Meese, Richard, and Nancy Wallace. 1994. "Testing the Present Value Relation for Housing Prices: Should I Leave My House in San Francisco?" *Journal of Urban Economics* 35 (3): 245-266.
- Munnell, Alicia H., Geoffrey M.B. Tootell, Lynn E. Browne, and James McEneaney. 1996. "Mortgage Lending in Boston: Interpreting HMDA Data," *American Economic Review* 86(1): 25-53.
- Muth, Richard. 1969. *Cities and Housing: The Spatial Pattern of Urban Residential Land Use*. University of Chicago Press. Chicago IL.
- Myers, Samuel L. and Chanjin Chung. 1996. "Racial Differences in Home Ownership and Home Equity Among Preretirement-Aged Households," *The Gerontologist* 36: 350-360.
- Oaxaca, Ronald. 1973. "Male-Female Wage Differentials in Urban Labor Markets," *International Economic Review* 14(3): 693-709.

- Painter, G., S. Gabriel and D. Myers. 2001. "Race, Immigrant Status, and the Housing Tenure Choice," *Journal of Urban Economics* 49: 150-167.
- Painter, G.S., L. Yang, and Z. Yu. 2002. "Heterogeneity in Asian American Homeownership: The Impact of Household Endowments and Immigrant Status," USC Lusk Center for Real Estate Research working paper.
- Pollakowski, Henry O., Michael A. Stegman and William Rohe. 1991. "Rates of Return on Housing of Low and Moderate-Income Owners," *AREUEA Journal* 19: 417-425.
- Quigley, John. 1987. "Interest Rate Variations, Mortgage Prepayments and Household Mobility," *Review of Economics and Statistics* 69(4): 636-643.
- Ratner, Mitchell. 1996. "Many Routes to Homeownership: A Four-Site Ethnographic Study of Minority and Immigrant Experiences," *Housing Policy Debate* 7(1): 103-145.
- Rehm, Barbara, A. 1991a. "ABA Rebutts Bias Charge in Fed Study on Lending," *American Banker*, pages 1 and 19. October 15.
- Rehm, Barbara A. 1991b. "Data on Bias in Lending Spark Demands for Action," *American Banker*, pages 1 and 9. October 22.
- Roistacher, Elizabeth A. and John L. Goodman. 1976. "Race and Home Ownership: Is Discrimination Disappearing?" *Economic Inquiry* 14: 59-70.
- Rosen, Harvey S. 1979. "Housing Decisions and the U.S. Income Tax: An Econometric Analysis," *Journal of Public Economics* 11: 1-24.
- Rosenthal, Stuart S. 1988. "A Residence Time Model of Housing Markets," *Journal of Public Economics* 36: 87-109.
- Rosenthal, Stuart S. 1999. "Residential Buildings and the Cost of Construction: New Evidence on the Efficiency of the Housing Market," *Review of Economics and Statistics* 81(2): 288-302.
- Rosenthal, Stuart. 2002. "Eliminating Credit Barriers to Increase Homeownership: How Far Can We Go?" in *Low-Income Homeownership: Examining the Unexamined Goal*, eds. Eric Belsky and Nicolas Retsina, Brookings Institution Press, Washington D.C.
- Rosner, Josh. 2001. "Housing in the New Millennium: A Home without Equity Is Just a Rental with Debt," *GrahamFisher Housing Trends*, June.
- Ross, Stephen L. and John Yinger. 2002. *Color of Credit: Mortgage Discrimination, Research Methods, and Fair Lending Enforcement*. MIT Press. Cambridge, MA.
- Schachter, Jason P. 2004. "Geographic Mobility: 2002 to 2003," *Current Population Reports* (P20-549). Washington, DC: U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau, March.
- Scheessele, Randall M. 2002. "Black and White Disparities in Subprime Mortgage Lending," *Housing Finance Working Paper Series*, HF-014. Washington, DC: U.S. Department of Housing and Urban Development, Office of Policy Development and Research.

- Shelton, J.P. 1968. "The Cost of Renting Versus Owning a Home," *Land Economics* 44: 59-72.
- Silberman, Jonathan, Gilbert Yochum, and Keith Ihlanfeldt. 1982. "Racial Differentials in Home Purchase: The Evidence from Newly Formed Households," *Economic Inquiry*, 20: 443-457.
- Sinai, Todd and Nicholas Souleles. 2005. "Owner Occupied Housing as Insurance against Rent Risk," *Quarterly Journal of Economics* 120 (2): 763-789.
- Smith, Barton A. and William P. Tesarek. 1991. "House Prices and Regional Real Estate Cycles: Market Adjustments in Houston," *AREUEA Journal* 19: 396-416.
- Smith, Lawrence B. and Michael H. C. Ho. 1996. "The Relative Price Differential between Higher and Lower Priced Homes," *Journal of Housing Economics* 5: 1-17.
- Stiglitz, Joseph E., and Andrew Weiss. 1981. "Credit Rationing in Markets with Imperfect Information," *American Economic Review* 71: 393-410.
- Thomas, Paulette. 1992. "Bank America, Security Pacific Merger Cleared," *Wall Street Journal*, pages A3 and A6. March 24.
- Turner, Margery Austin, et al. 2002. *Discrimination in Metropolitan Housing Markets: National Results from Phase I HDS 2000*. Washington, DC: U.S. Department of Housing and Urban Development.
- U.S. Departments of Treasury and Housing and Urban Development. 2000. *Curbing Predatory Home Mortgage Lending*, June.
- Wachter, Susan M. and Isaac F. Megbolugbe. 1992. "Racial and Ethnic Disparities in Homeownership," *Housing Policy Debate* 3(2): 333-370.
- Wheaton, William. 1977. "Residential Decentralization, Land Rents and the Benefits of Urban Transportation," *American Economic Review* 67(2) :138-145.
- Yinger, John. 1986. "Measuring Racial Discrimination with Fair Housing Audits: Caught in the Act," *American Economic Review* 76(5): 881-893.
- Yinger, John. 1998. "Housing Discrimination Is Still Worth Worrying About," *Housing Policy Debate*, 9(4), 893-927.
- Yoshikawa, Hiroshi, and Fumio Ohtake. 1989. "Housing Demand and the Saving Rate in Japan," *European Economic Review*, 33: 997-1030.
- Zorn, Peter M. 1989. "Mobility-Tenure Decisions and Financial Credit: Do Mortgage Qualification Requirements Constrain Homeownership?" *AREUEA Journal* 17: 1-16.