Estimation of Housing Needs amid Population Growth and Change

Dowell Myers
University of Southern California

John Pitkin
Analysis and Forecasting, Inc.

Julie Park
University of Southern California

Abstract

This article proposes a theoretical framework and more accurate methods for projecting the household growth component of estimates of housing needs. These estimates combine empirical evidence with normative assumptions about the quantity of housing expected with population growth. Recent California experience illustrates the theoretical and practical issues involved. Alternative empirical methods are used to model changes in per capita household formation and homeownership rates over time.

The results show great instability between 1960 and 2000 in the linkage between population and housing needs, casting doubt on which linkage to use for future projections. Past changes in housing growth are attributed to changing population composition and occupancy patterns for subgroups. Estimates based on a cohort method are lower than those using constant rates of housing consumption and conform much more closely to recent experience, but it may not be desirable to lock in the deficiencies of the past when projecting needs.

Keywords: Demographics; Homeownership; Household formation

Introduction

The concept of housing needs, roughly characterized as the number and type of housing units required to accommodate a population at a given standard of housing occupancy, is of central importance to state and local planning in the United States (Landis and LeGates 2000). Formulating a quantified estimate of housing needs requires many assumptions that intertwine normative and empirical judgments.

The aim of this article is to propose a theoretical framework and more accurate methods for the demographic component of estimates of housing needs. Grounding this in the recent California experience helps illustrate concepts with a concrete example. As demographic change continues across the country, growing numbers of regions and cities can benefit from using this new methodology.

Needs for housing or other private and public services rarely grow at an average rate. Over the next 20 years, the United States is expected to grow by nearly 50 million residents, but that increase will be very unevenly distributed (Campbell 1996). Not only will some locations receive a disproportionate share of the population growth, but some racial and ethnic subgroups will be growing far more quickly than others. In this policy environment, methodologies that use simple averages and hold past ratios constant will no longer serve us in good stead. The methodological innovations discussed in this article are better attuned to the variabilities posed by rapid population growth and change.

The article begins with a broad overview of the definition of housing needs and then focuses on the central role of population growth and change in determining future construction needs. A pivotal issue is the instability of the empirical relationship between population and housing over time, as shown by comparing household formation and homeownership rates from 1960 to 2000. A further issue is the sharp differences in housing consumption rates registered between different age, racial, ethnic, and nativity groups. Although disaggregation permits projections to capitalize on observed differences between groups, it also highlights the existence of inequities and the policy goal of reducing them.

The results of a recent California study are used to illustrate these theoretical and practical issues. Analysis discloses the relative contributions of population change and housing access to overall housing needs in California. Alternative projection models are compared with recent trends in terms of their empirical fit, as well as their desirability in policy terms. Concluding thoughts are then offered on how best to evaluate the demographic component of housing needs.

Population and housing needs

Defining housing needs

Estimates of housing needs are a pragmatic device for shaping and implementing public policies. Substantial differences in the treatment of housing needs have occurred over time and between places (Baer 1986; Varady 1996). However, individual studies rarely discuss the alternatives from which they chose their methodology; instead, each study asserts its own implicit definition and approach.

In the United States, estimates of housing needs are typically prepared for geographic areas governed by municipal or county governments, because it is local governments that regulate land use and new development. Although housing construction occurs in localities, needs often have regional or state importance. Consequently, preparing needs estimates can be required by state government, as in California, or by the state judicial system, as in New Jersey. State and regional agencies, or even nonprofit advocacy organizations, also depend on estimates of housing needs for particular subpopulations (for example, low-income, moderate-income, elderly, or single-parent households or large families) as a guide for setting priorities for the use of limited public funds. The recent emergence of smart growth planning practices also calls for greater reliance on estimates and projections of housing needs (American Planning Association 2002).

A variable blend of time-series trends, market demand, and normative assumptions, housing needs can be expressed in different ways. Estimates are prepared for either of two (and sometimes both) essential time periods:

1. The gap or deficit by which *current* local housing conditions fall short of a normative standard

2. The amount and characteristics of new construction required to accommodate *projected future* population growth at a particular normative standard

Current deficits. Current housing deficiencies are measured on two different dimensions: One denotes the quality of the *physical* housing stock, as indicated by such factors as age, complete plumbing, and code violations. The second relates to the *fit* between households and housing, most often indicated by the ratio of housing payments to income (a measure of affordability) or the ratio of the number of persons to the number of rooms in the unit (a measure of the level of crowding).

Measures of household fit, rather than physical quality, are much more frequently emphasized in the United States. There are likely two reasons for this. First, the vast improvement in housing quality since 1940 has sharply reduced the incidence of physical problems in the stock (Clemmer and Simonson 1983). Second, related to this improvement in quality, costs have increased, leading to a degradation of affordability (Landis and LeGates 2000) and, more recently, a growing problem of overcrowding (Myers, Baer, and Choi 1996).

Deficiencies in both physical and household fit are sometimes referred to as *social housing needs*, and they are treated as descriptions of current needs. At the local government level, these needs are almost always measured by data collected from the most recent census and thus can be outdated by anywhere from 2 to 12 years. Therefore, even though they are conceptualized as *present* indicators of quality, these measures of social housing needs must be updated in current and future estimates. For lack of other data, it is typically assumed that the per-household incidence of social housing problems from the last census remains unchanged.

Future construction needs. The alternative definition is *future construction needs*, representing the additional number of units required to house the projected growth in population.[1] The estimate is intended to be a credible, policy-relevant projection of future housing requirements. Credibility requires that projections be both feasible and consistent with observed trends in market behavior and accepted theories of market supply and demand. Policy relevance requires that they be based on, or related to, meaningful normative standards defining desired patterns of housing consumption.

In practice, future construction is estimated for the population as a whole by a simple translation. Traditionally, the projected population is divided by a current or extrapolated average household size (persons per household).[2] A widely adopted alternative method uses separate factors for each age group in the population (Myers 1988). Headship rates, defined as the ratio of householders (formerly termed household heads) per population in each alternative age group, are multiplied by future population numbers to generate the projected numbers of households expected to be formed by each age group. As will be discussed, there is considerable uncertainty about what set of headship rates to employ for projected periods.

Joining existing and future needs. Traditionally, the construction needs approach has simply addressed the total housing stock, combining middle- and higher-income sectors together with the lower-income

[1] Construction needs should also include an allowance for the number of housing units lost through natural disasters, demolition, mergers, and conversions to nonresidential use, and, if vacancy rates are judged to be abnormally low, the number of new units required to make up the deficit. This article considers only the household growth component of construction needs.

[2] For example, a future population of 10,000 people housed at 2.5 persons per household equals 4,000 housing units expected to be occupied; if the current housing stock is 3,000 units, then the construction need is 1,000 units.

sector. A common approach adopted in recent years to integrate social and future construction needs has been to specify the share of new units required in different price brackets or for different income groups.[3] This practice has been employed prominently in California, New Jersey, and Florida (Calavita, Grimes, and Mallach 1997; California Department of Housing and Community Development 1988; Noll, O'Dell, and Smith 1997). This method assumes that key distributions, such as the future ratio of renters to owners and lower-income to middle-income households, remain constant at the level observed in the last census. The distributions from the last census are simply applied to the total projected future households to allocate future social needs.

Homeownership goals. In addition to total and social housing needs, homeownership goals are of great interest. Increasing the number and proportion of households that own their own homes has been a cornerstone of American housing policy for over half a century. Homeownership has economic and social benefits for owner households as well as civic benefits for the communities in which they live (Green and White 1997; McCarthy, Van Zandt, and Rohe 2001). Moreover, as a practical matter in a market economy, production of new units requires an expansion of the capacity to own and finance a larger stock of units. Future needs for ownership and financial capacity are largely determined by the tenure of the required housing units, whether owned or rented. Inputs of land, materials, and labor also differ markedly for owned and rental units. For these reasons, projections of housing needs usually detail the increases in renter and owner occupancies and housing stocks separately.

Population projections for housing needs

The fundamental driver that generates estimates of future housing needs is projected population growth. In principle, a great many factors could drive future needs, including employment growth and housing market projections, political initiatives, or other factors. For a variety of reasons, however, population projections have been universally adopted as the basis for estimating housing needs. One advantage is that people and housing units are closely linked. Perhaps more important, population projections are widely available and are in fact the most common means by which state and local governments quantify the future for planning purposes.

[3] One lesson Varady (1996) drew from his study of housing plans in Great Britain was that housing needs should be defined for the entire market and not just for the disadvantaged sector.

Institutional reliance. Population projections have been highly institutionalized, and projections of housing needs based on population have an inherent credibility. In the United States, the most widely used population projections come from federal and state agencies, for example, the U.S. Bureau of the Census (1996), the California Department of Finance (1998), and the Texas State Data Center (2000), which have employed cohort-component methods to project population by age, sex, and race or Hispanic origin. More recently, to meet rising demands for information on the foreign-born population, the U.S. Bureau of the Census (2000b) issued its first projections of the United States population by nativity (foreign or native born) as well as by age, race, and ethnicity. One of the authors of this article has further extended the accounting of immigration status to disaggregate period of arrival (and, implicitly, duration of residence) for the foreign-born population in projections for the United States and California (Pitkin 2000; Pitkin and Simmons 1996).[4]

Accuracy through disaggregation. As will be shown later, pronounced differences can be found in housing consumption by age, race, ethnicity, nativity, and duration of residence. Whenever the populations of various demographic strata are growing at different rates, housing needs projections that incorporate past differences in per capita headship and homeownership rates between strata are likely to be more accurate than projections based on rates for all strata combined. The existence of suitably disaggregated population projections facilitates the incorporation of these differences into housing needs projections.

Proxy for income. Economic theory emphasizes income as the factor that most directly determines housing consumption. Indeed, mortgage brokers and landlords know that a certain level of income is required for buyers and tenants to qualify for a given price or rent. Unfortunately, income projections are not consistently available or sufficiently reliable for estimates of housing needs. In any event, including income does not necessarily raise the reliability or credibility of housing needs projections. Average income is closely correlated with age, race, and ethnicity—factors addressed in population projections. Thus, demographic changes serve as a good proxy for changes in average income. Moreover, income actually has much less effect on the current housing of older households than on young households that are newly making housing decisions.[5] In

[4] Once the population of past arrival cohorts is determined for a base period, the projected populations of arrival cohorts are determined by the same migration and mortality components used in recent projections by the Bureau of the Census.

[5] In particular, patterns of residential mobility mean that households over age 45 often selected their current residence a decade or more earlier on the basis of their income at that time, and so their income becomes less directly linked to their residence as they age in place.

this respect, demographic projections possibly serve better than income projections without demographic detail. Thus, income can be useful as a policy instrument without adding to the reliability of the projections.

Temporal instability and demographic differences

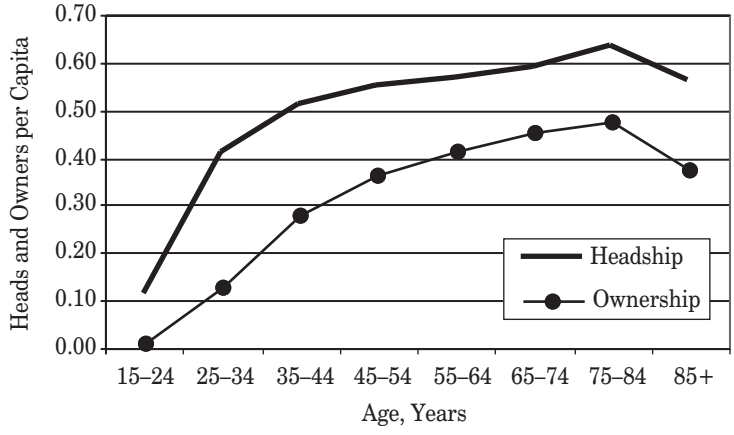
Past changes are the only evidence we have for setting expectations for future changes in the relationship between housing needs and population. Housing needs are related to population, either directly, on a per capita basis, or indirectly, on a per household basis. Estimates of housing needs are based on a population projection, along with specific assumptions about the relationship between size of the population and the number of housing units that it will occupy. Even though much of the following discussion addresses empirical regularities in the past relationship between population and housing, estimates of housing needs are also shaped by policy desires to elevate housing standards. The analytic use of the observed differences between groups and changes over time inevitably raises policy questions.

Life-cycle profiles of household formation and homeownership

There are large differences in the propensity of adults in various age groups to head, or form, separate households (to be a "householder"). These variations in the ratio of household heads to the total population, or the per capita "headship rate," have persisted for over a century and are associated with changes over the life cycle: In late adolescence, people begin to leave their parents' homes; in their early twenties, increasing numbers of them form separate households as incomes rise and families take shape; thereafter, the fraction heading households rises gradually until old age and then eventually begins to decline as people move in with their children or into group homes. In 2000, the headship rate at age 15 to 24 in California was 11.1 percent, and it reached a peak of 63.1 percent for those between 75 and 84 years old. (See figure 1.)

Homeownership rates can be expressed in a parallel fashion, defining per capita rates of homeownership as the number of homeowners of a given age or the like divided by the total population of that same

Figure 1. **Headship and Ownership Rates by Age, California, 2000**

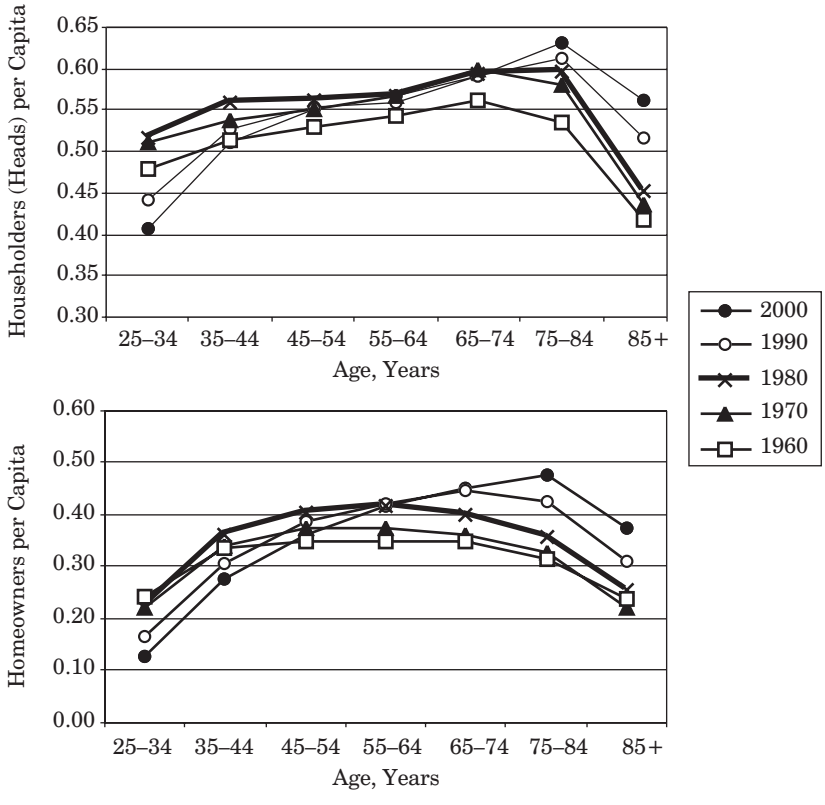


group.[6] Homeownership rates vary with age for the same life-cycle reasons as headship, although they are lower and rise more gradually in early adulthood. Homeownership is always lower than headship because it is a subset (the rest of the householders are renters) (figure 1).

For decades age-specific household headship and ownership rates have been stable though not constant. In California, for example, headship rates at most ages increased between 1960 and 1980, but the next two decades saw declines in early adulthood while rates for the older population continued to increase (figure 2). Similar but even larger shifts are observed with regard to homeownership rates. Fluctuations in the ratio of housing to population undercut the credibility of housing needs projections that assume future stability. If rates have changed in the past, should they not be expected to change in the future as well? Moreover, there persists an urgent policy question about what set of rates is even *desirable*: Should we plan to accommodate the most recent rates, the highest recent rates (implying greater housing well-being), the lowest recent rates (implying lower supply requirements), or whatever trend is extrapolated for the future?

[6] A *per capita* measure offers a distinct advantage over the more usual *per household* measure of homeownership (the fraction of households that are homeowners). While the latter rate can increase because of a reduction in the denominator, such as a decline in renter households through doubling up or homelessness, the former can increase only if the number of owner households rises. Changes in the per capita measure therefore have an unambiguous normative interpretation. In addition, the per capita measure of homeownership can be directly applied to population projections to yield homeownership projections.

Figure 2. **Headship and Ownership Rates by Age, California, 1960 to 2000**



Efforts to build credible methods for projecting future housing needs have led to a search for underlying regularities in previous housing consumption data. Patterns that have been consistent in the past might reasonably be expected to persist in the future and therefore could be used to reduce the uncertainty of projections. By making the choice of certain rates seem more reasonable, past regularities can also help focus debate over what is normatively desired. Our approach is to identify past differences in rates across demographic characteristics other than age and then see whether these differences help account for recent changes in aggregate headship and homeownership rates.

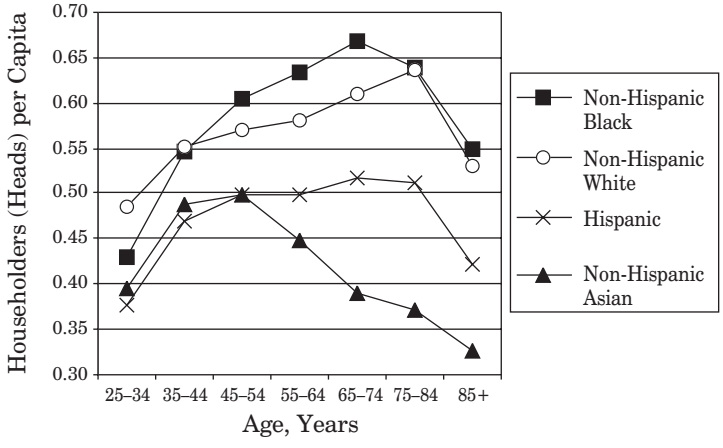
Race and ethnicity

Race and ethnicity pose a particular opportunity, and dilemma, for housing needs analysis. These salient dimensions have long been associated with differences in housing occupancy, and, in fact, there have

been marked differences between both the household headship and homeownership rates of different racial/ethnic groups in California.

The headship rates, by age, for the four major racial/ethnic groups[7] in California in 1990 are shown in figure 3. Among Asians, headship rates do not exceed 50 percent in any age group and are especially low among the elderly. Hispanics have the second lowest set of headship rates in 1990, falling about 10 percentage points below the rates for blacks and about 5 percentage points below the rates for whites. These differences in household formation reflect cultural differences in marital behavior, family structure, and care for the elderly, in addition to variations in household resources.

Figure 3. **Headship Rates by Age and Race, California, 1990**



To the extent that behavioral differences between different groups are compounded by demographic compositional changes that place greater weight on one group or another over time, disaggregation by race and ethnicity can lead to more credible projections of housing needs. For California, differences in headship rates imply, for example, that as Hispanics and Asians comprise a larger share of the population, total housing consumption and needs are expected to grow more slowly than would otherwise be expected because these populations form fewer households per capita than the predominantly native-born, non-Hispanic white and black populations do. Thus the intent of disaggregation by race is to estimate more precisely the total amount of housing needs, not to ratify racial differences as targeted quotas.

[7] The four groups are (1) Hispanics or Latinos and the non-Hispanic portion of (2) whites, (3) blacks or African Americans, and (4) Asian and Pacific Islanders.

Nativity and duration of residence in the United States

More recently, the large, sustained increase in the number of immigrants, particularly in California, has called attention to differences in housing occupancy rates between the native- and foreign-born populations. By 2000, the foreign-born population comprised over a quarter of all Californians, and many observers reported that newly arrived immigrants tended to double up in shared housing much more than the native-born population of similar age and ethnic origin. Studies have also recognized the importance of nativity in analyzing national housing trends (Masnick and Di 2000).[8]

Immigration poses a more complex challenge for housing needs analysis than race does. Not only are the new arrivals often of different races than the United States white majority population, but the housing behavior of immigrants changes dramatically the longer they reside in this country. This within-group temporal change in housing behavior is greater than is typically observed for native-born populations.

Patterns observed for California in 1990[9] are clearly illustrative. With negligible exceptions, per capita *headship* rates, indicating foreign-born residents' tendency to form separate households, were lower than the rates for their native-born peers of the same ethnic groups (figure 4). The native-foreign differences are much wider at older ages and greater for those who had arrived in the United States during the previous decade than for those who had arrived earlier. Below age 35, where the great majority of recent immigrants are found, however, the only substantial difference was for those Hispanics aged 25 to 34 who had arrived in the previous decade and whose headship rate was one-fifth lower than the rate for native-born Hispanics of the same age.[10]

The profile of differences by nativity in per capita homeownership rates in 1990 was broadly similar to the differences in observed household

[8] National projections of households and tenure "must necessarily look at differences between native-born and foreign-born residents" (Masnick and Di 2000, 2).

[9] Comparable data for analysis from the 2000 census will not be available until 2003.

[10] Relatively little research has been conducted on household headship among immigrant populations. However, a study of residential overcrowding by Myers and Lee (1996) sheds indirect light on headship rates, because overcrowding is inversely related to headship. Using data from the 1980 and 1990 censuses, Myers and Lee (1996) find significant variation by length of residence in the United States and argue for use of a double-cohort method based on both birth and arrival (immigration) cohorts.

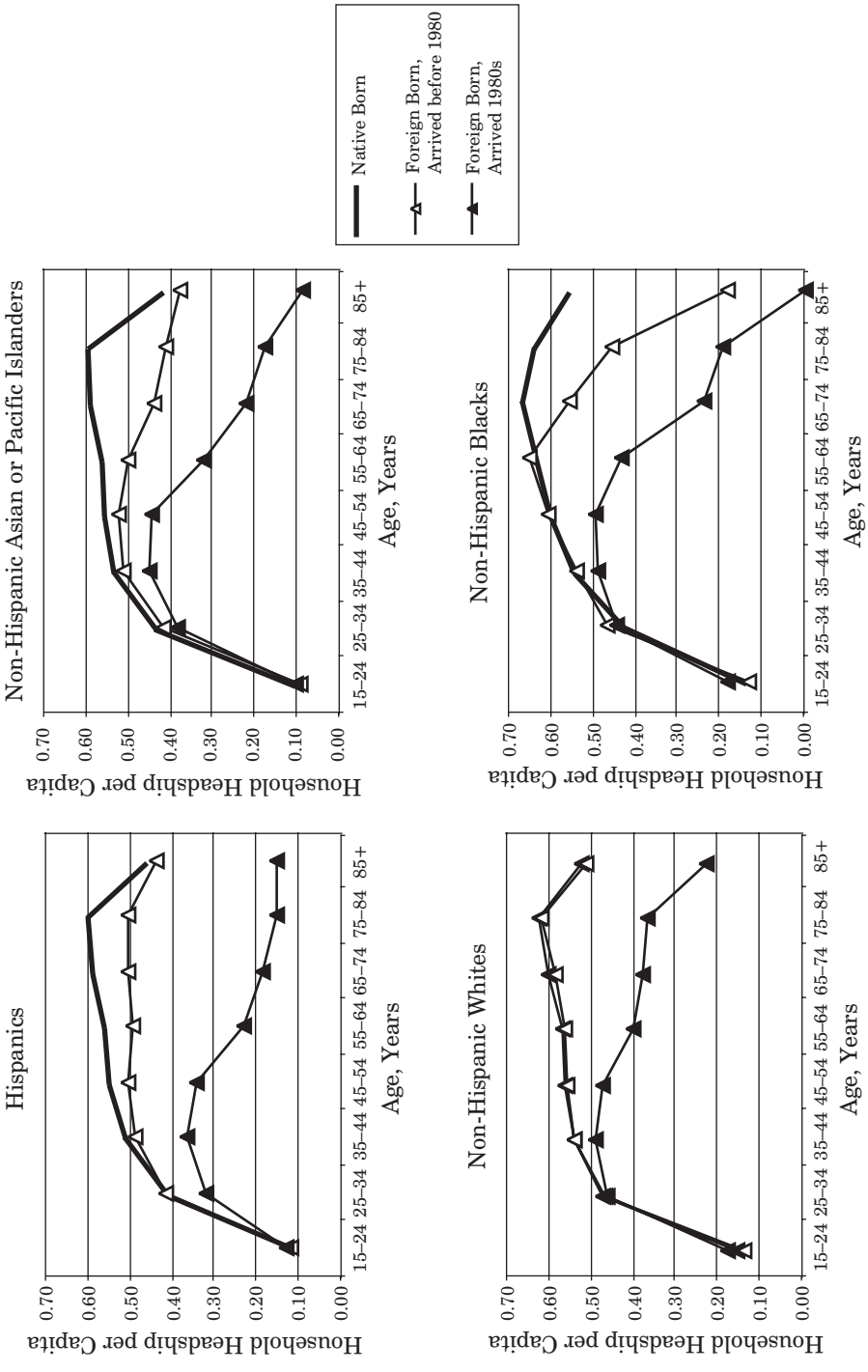


Figure 4. **Per Capita Headship by Nativity, California, 1990**

headship rates. However, the differences by duration among immigrants and between foreign- and native-born persons were larger than for headship. (See figure 5.) It should be noted in particular that the large populations of recently arrived Hispanic and Asian immigrants aged 25 to 34 were substantially less likely to be homeowners than either native-born or longer-resident immigrants of the same age.[11]

To summarize, these differences were greatest at older ages but appear too small at younger ages to have contributed greatly to the overall declines in per capita headship and homeownership between 1980 and 1990 or between 1990 and 2000. However, when combined with the sharp increases in the volume of new immigrants over the past three decades, the differences are large enough to require an accounting of the foreign-born population's duration of residence in the United States through a refined longitudinal analysis.

Components of change in California housing consumption, 1980 to 1990

Some part of past changes in the numbers of households, homeowners, and renters is due to the changing composition or mix of the population that places greater weight over time on one subgroup or other. Another part of these changes is due to changing rates of headship or homeownership within all the specific demographic subgroups. It is important to know the relative size of these components of past changes. If most of them can be explained by population mix, then population projections alone are a sound basis for estimating housing changes. However, if changing rates of headship and homeownership within groups are major contributors, then analysts will need to pay greater attention to selecting the right set of rates to estimate future needs.

The most recent data available for California come from the changes between the 1980 and 1990 censuses, since the full data needed for this analysis are not yet available for the 2000 census. Using these data, we estimated the direct effects of changes in the composition of the

[11] In a pioneering econometric study of immigrants in Australia, Bourassa (1994) estimates that ownership rates increased by 1.7 percentage points for each additional year of residence in the country. McArdle and Masnick (1995) focus on 1980 to 1990 census trends in ownership by immigrants who arrived in the United States during the 1970s. Myers, Megbolugbe, and Lee (1998) employ a statistical model of immigrants to the United States to estimate the trajectories of distinct immigrant and birth cohorts between the same two censuses. After adjusting for income and price effects that alter the probability of homeownership, they find that substantial effects persist both for differences between arrival cohorts and for increased consumption with growing duration since immigration.

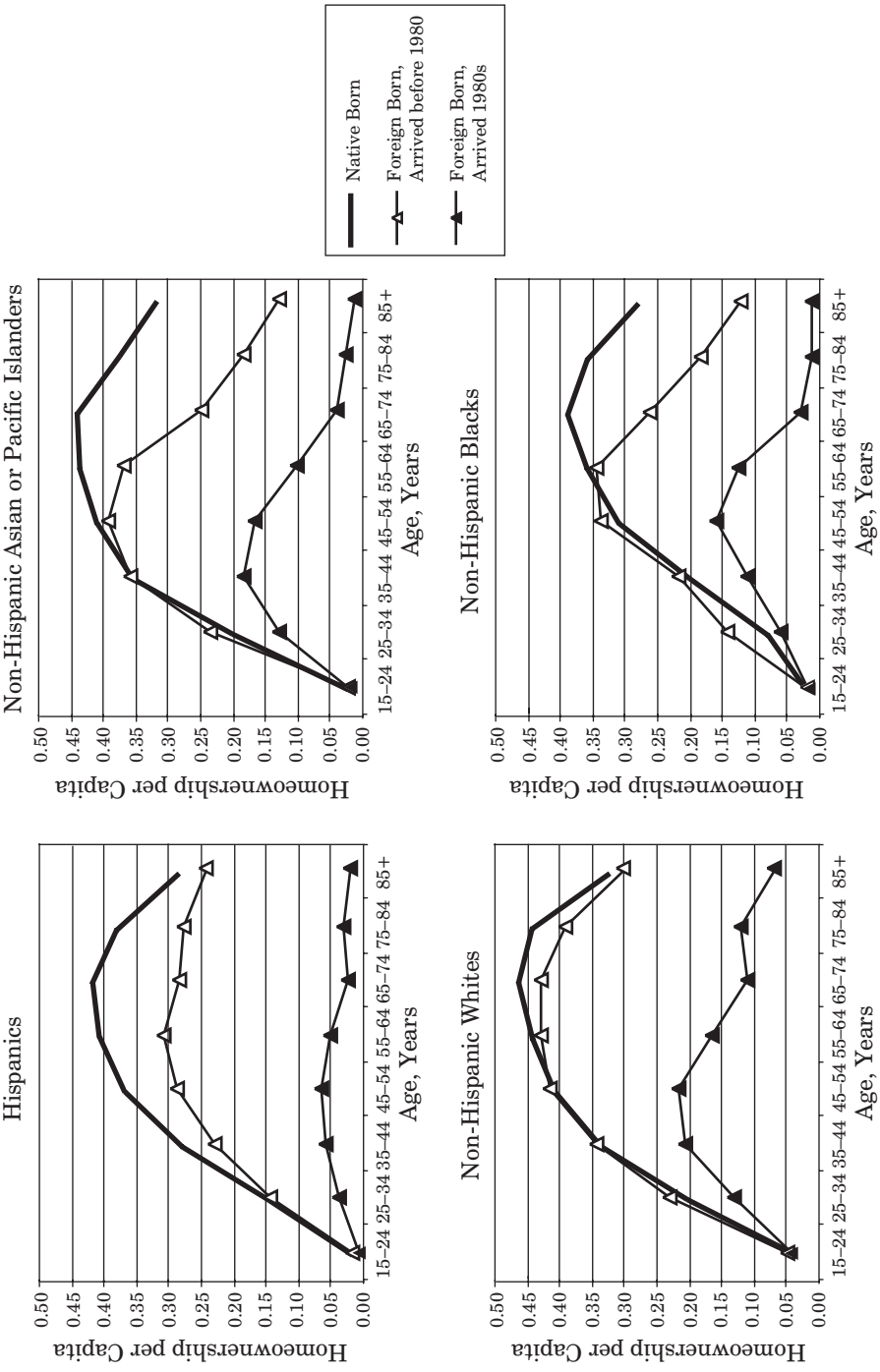
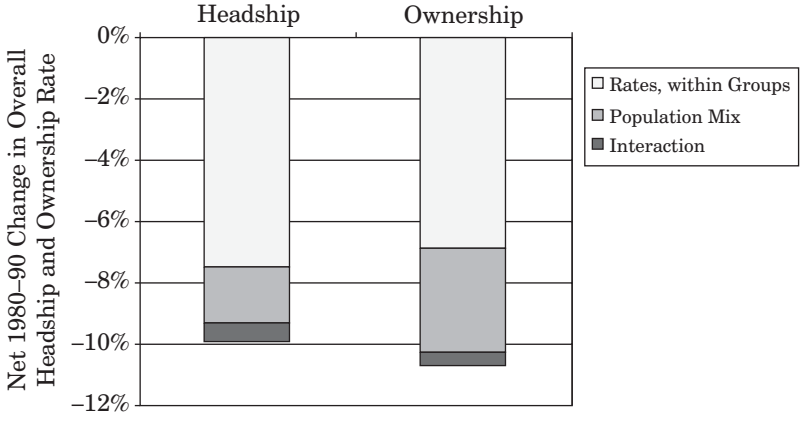


Figure 5. **Per Capita Homeownership by Nativity, California, 1990**

population by race, nativity, and duration of United States residence on total headship and homeownership rates.[12]

We found that some of the declines in overall headship and homeownership rates during the 1980–90 period can be accounted for by shifts in the demographic mix of the population, but that the bulk of the declines cannot. For overall headship rates, the effect of changes in race-nativity composition was –1.8 percent, changes in headship rates for specific subgroups were –7.5 percent, and the interaction of the two effects lowered the average a further –0.6 percent (figure 6). For overall homeownership rates, the effect of changes in race-nativity composition was –3.4 percent, changes in homeownership rates for specific subgroups were –6.9 percent, and the interaction of the two effects lowered the average a further –0.4 percent (figure 6).

Figure 6. **Components of 1980–90 Changes in per Capita Headship and Ownership Rates in California**



[12] We use a components-of-change analysis to identify sources of change in the number of households and homeowners in California between 1980 and 1990. This technique shows how various factors cause the rate of growth in households and homeowners to deviate from the rate of growth in the adult population. (In California during the 1980s, the population over age 15 increased by about 5 percentage points more than the number of households or homeowners did.) These factors are changes in the age composition of the population; changes in the mix of race, ethnicity, nativity, and duration of United States residence within age groups; and changes in the per capita rates of household headship and homeownership within age-race-ethnicity-nativity-duration groups. An interaction effect among these components also contributes to the difference between household/homeowner growth rates and the population growth rate. A more detailed methodological description of the components of change analysis is available in Pitkin 2002.

Thus, changes in the composition of the population have had modest negative effects on the numbers of both total and owner households, while declines in headship and homeownership rates *within* age-race-nativity groups have had substantially larger effects. This implies that the credibility of projections would be considerably enhanced if they could also incorporate any past consistency in the *trends* in headship and homeownership rates over time, in addition to the effects of shifts in the composition of the population.

Dynamics, cohorts, and policy goals

Alternative empirical approaches, or specifications, can be used to model changes in per capita household formation and homeownership rates over time. The choice of approach not only determines which empirical regularities are carried forward in the projections, it implicitly affects the policy standard. In the case of California, alternative approaches lead to quite different projections and standards for housing needs in the coming decades.

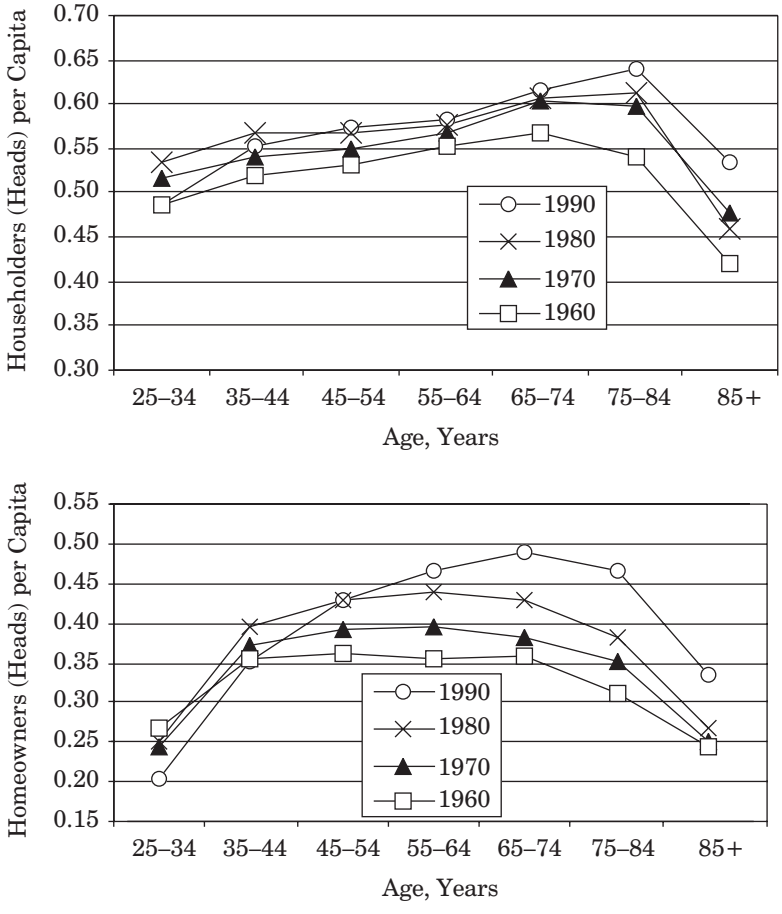
To see the differences between methods, we consider past changes in per capita household headship and homeownership rates for native-born whites in California at different ages (figure 7). By focusing on the population that is both non-Hispanic white and born in the United States, we eliminate changes caused by shifts in the immigrant or racial composition of the population. These plots are otherwise similar to those in figure 2 for the entire population but exclude the year 2000 because data on nativity by race were not available at the time we wrote this article. They show the same across-the-board increases from 1960 to 1980, followed by declines at ages below 45 in the 1980–90 decade, while the rates for those over 75 continued to increase. There are indications from 2000 census data on the entire population (in figure 2) that many of the 1980–90 trends continued during the 1990s.

Thus, there has been considerable continuity in the changes in per capita headship and homeownership rates from decade to decade. These rates have not fluctuated randomly up and down. Rather there were across-the-age-range increases from 1960 to 1970 and again from 1970 to 1980.[13] Since then, the pattern reflects continued increases for older adults and declines for younger ones.

One fairly obvious approach to estimating future headship and homeownership rates is to simply trend forward the *age group* rates from

[13] In fact, the same pattern of changes in headship rates goes back to at least the 1950 census.

Figure 7. **Headship and Homeownership Rates by Age for Native-Born Non-Hispanic Whites, California, 1960 to 1990**



past censuses or surveys. This approach, proposed by Siegel (1972), has been used by the U.S. Bureau of the Census (e.g., 1996) to project headship rates and households for the United States.[14] When this approach was developed, that is, before 1980, headship rates had been rising at all ages, and intergenerational differences of the kind we have recently seen had not yet emerged. If applied to California in the post-1990 period and calibrated to 1980–90 changes, this model would imply a continuation of the diverging trends by younger age groups toward lower rates of headship and homeownership and by older age groups toward higher rates (unless future changes are arbitrarily scaled back).

[14] The Bureau of the Census model now uses quarterly headship rates from the Current Population Survey instead of decennial census data.

The weakness of this method is that there is no intrinsic reason why the trends in different age groups should continue to run in opposite directions. Also, the increases among the elderly group are inherently limited to those cohorts that are already on higher trajectories of headship or homeownership than their predecessors. At the same time, generational differences, which are especially strong in homeownership, would be blurred. A final problem is that projections based on this method lack a clear normative interpretation other than maintaining an arbitrary measure of past progress. For these reasons, the method of trended age rates is less credible than the two other alternatives that will be described.

Assumption of constant rates in the future

The simplest assumption for projections, and the one most often used, namely that future rates will remain constant at their last observed value, ignores the regularity of these trends over time. It has a clear interpretation for projecting housing needs: *Future generations will attain the same standard of housing (household formation and homeownership) at each age as was achieved by the generation of that age at the previous census.*

Before 1980, the implication of this assumption for housing goals was also fairly clear. In view of the sustained increases in headship and homeownership, the backward-looking constant-rate standard was regularly exceeded in the subsequent decade and was therefore conservative, particularly with regard to homeownership rates (see figure 7). Its implications for overall housing goals after 1980 are not obvious because of divergent changes at different ages.

There has been, however, a generational pattern in the post-1980 changes in headship and homeownership rates. For cohorts younger than 45 in 1990, there were declines in both headship and homeownership rates, while for those over 65, there were increases in both rates. Such generational regularities provide the rationale for an alternative assumption and standard for projecting housing needs.

Cohort dynamic rates

By using dynamic cohort rates, generational differences in headship and homeownership can be carried forward and at the same time allow for normal life-course changes as each generation ages.[15]

In this formulation, the life-cycle changes in headship rates are calibrated, for example, to the difference between the headship rate for 65- to 74-year-olds in the 2000 census and the rate for 55- to 64-year-olds in the 1990 census. This difference measures the actual change in average headship rate made by a particular group of individuals, or birth cohort, over the 1990s.[16] This difference is used to project, say, the headship rate of 65- to 74-year-olds in 2010 starting from the actual rate for 55- to 64-year-olds in 2000. In this way, any differences in headship rates between the generation aged 55 to 64 in 1990 and the generation of that age in 2000 will be carried forward through the life cycle.

In the cohort dynamic model of housing, analogous changes in rates are calculated and applied separately for all ages and racial/ethnic groups. An intercensus cohort model for projecting household formation and homeownership was first proposed and implemented for the United States by Pitkin and Masnick (1980).

This formulation describes the recent diverging trends in the headship and homeownership rates of younger and older populations in California in a credible, consistent manner based on the different conditions that the generations encountered when they entered the housing market. Since 1980, those cohorts coming of age and entering the market in California, the second half of the baby boom generation, have encountered higher housing costs than the previous generation, and, as a result, their headship and homeownership rates have been below those of the group that entered the market in the more affordable 1960s and 1970s. By contrast, the recent continued increases among those over 65 are in large measure a legacy of the successive increases in housing consumption rates of middle-aged persons (those aged 45 to 64) in the 1960s and 1970s. The pattern of changes in homeownership in the lower panel of figure 7 is especially noteworthy.

---

[15] This method has been explicated in a series of articles (e.g., Myers 1999; Pitkin and Myers 1994), and contrasts have been fully elaborated with the alternative model of constant rates.

[16] It is a net change and may be slightly affected by mortality and interstate migration between censuses.

The cohort model has a clear interpretation for projecting housing needs: *Each future generation will progress toward a higher (or lower) standard of housing (household formation and homeownership) at the same net rate (i.e., with similar slopes) as the generation passing between the same ages in the two previous censuses. Generational differences are maintained as each cohort tracks on different levels that reflect past advantages or disadvantages.*

The cohort model must be modified for the foreign-born population. The housing patterns of immigrants, like those of native-born persons, are shaped by the market conditions that prevail during the period when they first enter the market. For immigrants who arrive as adults, this period is determined not by when they come of age, but rather by their date of entry into the United States. The large differences between the headship (and homeownership) rates of recent and less recent immigrants seen in figures 4 and 5 indicate the importance of this period in immigrants' housing careers. To meet this need, a "double-cohort" model of immigrants' housing consumption, one specifying both birth and period of arrival, was elaborated by Myers and Lee (1996) and further developed by Myers, Megbolugbe, and Lee (1998).

Alternative forecast models for California

The two alternative methods for future housing needs that should be considered are the constant rate and cohort models. While they have different normative interpretations as bases for future housing needs, both are necessarily empirical compromises between theory, the availability of data, and policy-making requirements. A choice between them must hinge in part on their specific implications for projected housing needs and goals.

These concepts all came to the fore in a study of housing needs in California, which was commissioned by California's Department of Housing and Community Development, the Great Valley Center, and the Fannie Mae Foundation. Subsequent reflection on the results of this study has brought to light conflicts between empirical regularities and policy desires for the future. In this study, alternative methods used to project housing occupancy rates were applied to the 1990–2000 period before the housing results of census 2000 were known, and so we can evaluate how well the various methods fit the observed changes. Comparisons can also be made to the projections of California housing needs produced by other scholars.

Three different methods were employed and are briefly identified as follows:

1. Constant method—constant rates of housing occupancy (1990 base) within each detailed demographic group

2. Cohort method—cohort rates based on the record of 1980–90 trajectories and observed 1990 and estimated 2000 launching points

3. Mixed method—a mixed model of cohort rates averaged with constant rates

Constant method

The projections based on the constant rate method assume that future residents will be housed in the same manner as specific demographic groups in 1990. Demographic groups are defined by the four major racial/ethnic groups, by age group, and by immigrant status (native born, or immigrant arrivals before 1960 or in the 1960s, 1970s, 1980s, 1990s, or 2000s). The 1990 rates are held constant for the future by assuming that housing consumption for future residents will depend solely on their race, age, and immigrant status. For example, the housing patterns of new Hispanic immigrants aged 35 to 44 in 2000 will look like those of Hispanic immigrants in the same age group who were new immigrants in 1990.

By holding 1990 rates constant, this method of estimation fails to reflect the downturn in housing consumption that has been under way in California since 1980. For this reason, it likely overpredicts household formation in the 1990s and yields very high projections of future occupied housing. In addition, the constant rates method cannot account for the continuity of future housing occupancy with the levels achieved by the same people in the previous decade. For example, a generation starting out at lower levels of headship and homeownership in 1990 is unlikely to leap in 10 years to the higher level of those who were 10 years older in 1990. The continuity in their housing careers is better captured by the cohort methods described next.

Cohort method

Using this method, a model that replicates the 1980–90 net *changes* in headship and homeownership rates for cohorts was constructed. Each cohort's rates are projected forward by appending these net changes to

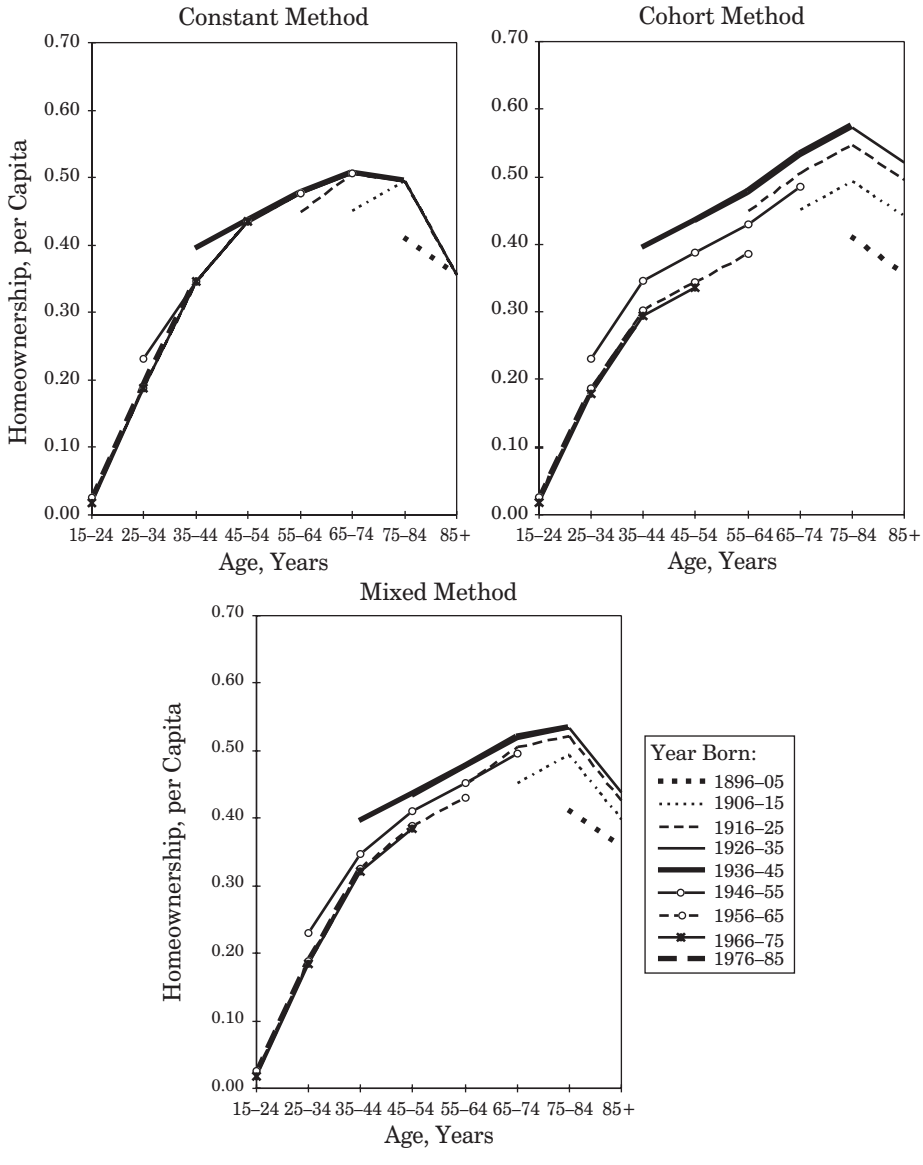
its initial, 1990, headship and homeownership rates. The size of the increments to be added by a cohort replicates the net changes recorded by the earlier cohort that passed through the same *age span* (e.g., 35 to 44 to 45 to 54) in the 1980–90 decade. For immigrants, the increments repeat the 1980–90 net changes by the immigrant cohort that passed through the same age and duration of residence interval (e.g., passing from age 35 to 44 with 10 to 19 years of U.S. residence to age 45 to 54 with 20 to 29 years of residence). Each cohort's future headship and homeownership rates thus reflect their initial 1990 rates and the changes made by earlier cohorts as they pass through the same age and duration of residence categories between 1980 and 1990.

Projections by this method of *foreshadowed cohort increments* are most reliable for cohorts with established trajectories in the housing market (Pitkin and Myers 1994). For groups that we cannot yet observe—those entering adulthood or arriving after 1990—we assume that the pattern of previous new entrants will simply be repeated, including not only the increments but also the starting levels for the trajectories.

A comparison of the findings from the alternative methods can be illustrated with regard to homeownership in the case of one specific population group: non-Hispanic, native-born whites. Per capita homeownership rates are displayed in three alternative graphs in figure 8, reflecting the constant rates and cohort methods, as well as a third, mixed model. For consistency, all three graphs are arranged in cohort format. This means that we do not show separate lines for 1990 or 2000, but instead display the trajectories of different birth cohorts (the oldest born between 1886 and 1895 and the youngest born between 1976 and 1985), showing their projected homeownership level as they pass through different age groups across decades. The first segment in each trajectory pertains to 1980–90, the second to 1990–2000, the third to 2000–10, and the fourth to 2010–20.

The relative strength of the cohort method is that it carries forward the cohorts' housing careers in a fashion more consistent with the observed past (1980–90). The corresponding weakness of the constant rate method is evident in the discontinuities observed for each cohort's expected trajectories. At younger ages, we see that the newer cohorts would require rapid, unprecedented increases in homeownership to close the gap from their lower starting levels in 1990. Conversely, elderly cohorts would need to reverse earlier upward climbs to match the lower homeownership rates implied by the constant model.

Figure 8. **Projected Homeownership Rates by Birth Cohort for Native-Born Whites, California, 1980 to 1990 and 2000 to 2020**



Sources: 1980 and 1990, U.S. Bureau of the Census (1983, 1993); 2000 to 2020, authors' projections

The major deficiency of the cohort model in this period lies in its policy implications, because it preserves cohorts' lower initial levels and smaller increments of both headship and homeownership. It projects the lagging achievements of newer cohorts as permanent and without chance for catch-up through accelerated progress in future years. Thus,

the cohort model yields the lowest projections of our alternatives, and to set these housing numbers as policy goals is to ratify and endorse the recent declines. It may not be desirable to embrace such pessimistic forecast targets for policy purposes.

The mixed method

The projections based on this method offer a balance between constant and cohort rates: The mixed model averages the projections of the other two. The resulting forecast targets allow for some catch-up from the cohort levels, closing half the difference between the cohort forecast and age group expectations based on 1990 constant rates. They imply that cohorts will close half the gap between themselves and their predecessors. This is shown in the lower panel of figure 8, where the cohorts retain much of the parallel form seen in the cohort method, but with much smaller gaps between them. Those gaps are closed in this alternative projection by steeper increases of young cohorts in the second segment (1990–2000) of their trajectories. (For example, compare homeownership achievements at age 35 to 44 for the cohort and mixed models.) The mixed model does not move California's residents all the way to the housing occupancy levels enjoyed in 1990, but it does allow for some catching up with earlier generations.

The overall strength of the model for this period is that it embeds the empirical regularities described by the cohort projections while avoiding the pessimistic policy assumption that previous low achievement will be followed by slow progress. For policy purposes, it is clearly preferable to select estimates that enhance the housing well-being of Californians.

To be credible, however, the estimates must also be seen as consistent with past and foreseeable future capacity for housing production.

Actual and expected trends in occupied housing

Forecasts of housing needs are prepared by combining information on population trends with information on housing occupancy patterns. The components are symmetrically detailed, specifying both the size of population groups and their housing occupancy rates by age, race/ethnicity, and immigrant status. The housing occupancy rate (headship or homeownership) for each specific group is then multiplied by the projected number of people in that group to yield the number of forecasted households or homeowners. This article has focused on choosing

the right occupancy rates. Also needed are population projections detailed by age, race/ethnicity, and immigrant status.[17]

The alternative housing needs projections can be compared with past trends in the growth of occupied housing. Actual growth in occupied housing declined markedly in California between the 1980s and 1990s (table 1). This decline reflected a slowing of population growth and an even greater decline in construction. During this period, termed "the Great Housing Collapse" (Myers and Park 2002), construction levels remained at their lowest postwar levels for several consecutive years. Part of the shortfall was covered by a drawdown of rental vacancies, with the result that California's 2000 rental vacancy rate was 3.7 percent, far below both the national average of 6.8 percent and the 6 percent desired by the state government.

Table 1. **Growth in Occupied Housing in California, 1980 to 2010**

	Total Households	Owner Occupied	Renter Occupied
Actual[a]			
Change 1980 to 1990	1,742,489	1,003,888	738,601
Change 1990 to 2000	1,133,321	672,486	460,835
Projected Change, 1990 to 2000[b]			
Constant method	1,464,217	1,033,903	430,314
Cohort method	795,715	646,659	149,056
Mixed method	1,129,966	840,281	289,685
Projected Change, 2000 to 2010[b]			
Constant method	2,263,130	1,623,830	639,300
Cohort method	1,569,906	1,124,434	445,472
Mixed method	1,916,518	1,374,132	542,386

[a]U.S. Bureau of the Census decennial census: 1980, 1990, and 2000 (1983, 1993, 2000a).
[b]Authors' projections.

When the three housing projection models are applied to population growth from 1990 to 2000, the results of the mixed model come very close to matching the observed growth in total occupied housing. As expected, the other alternatives are either much higher or much lower. Projection results vary substantially, however, in their ability to match observed growth in owner- and renter-occupied housing. The mixed

[17] For our purposes, customized projections of California's population (Pitkin 2000) by nativity were produced by a model that was first developed in 1996 to project the national population for the Fannie Mae Foundation Immigration Research Project (Pitkin and Simmons 1996). The complete data for the new population projections are available, with documentation, at <http://www.usc.edu/sppd/futures>.

model overestimates growth in homeowners and therefore underestimates growth in renters (table 1). The cohort model yields estimates much closer to the observed growth in homeowners but substantially underestimates renters (because it underestimated total household formations).

The three projection alternatives for the current decade, 2000–2010, agree on one aspect: All three foresee substantial increases in growth relative to actual growth in the 1990s. The constant rates model projects total household growth during this decade to exceed that of the 1990s by 99.7 percent, the cohort model by 38.5 percent, and the mixed model by 69.1 percent (calculated from table 1). All three imply that housing construction in California will need to increase sharply in the coming decade.

Other forecasts of California housing have come to similar conclusions, although with significant differences. A study conducted by John Landis for the California Department of Housing and Community Development (2000) foresaw the need for 2,200,000 additional housing units between 2000 and 2010 (an increase of 94.1 percent over the 1990s), a figure very close to the one produced by our constant rates model. The middle forecast by the Center for the Continuing Study of the California Economy (Levy 2001) yielded an anticipated growth of 1,950,000 occupied housing units, a 75.7 percent increase over 1990s growth, close to our mixed model estimates. It must be emphasized, of course, that all of these projections assume the absence of any calamities or extreme shocks to the economy. They also presume a continuation of recent government practices, although the sharp increase in anticipated construction would surely require an escalation in local development approvals, strongly at odds with the state's existing political climate.

Conclusion

Estimates of housing needs in the United States are merely advisory in almost every instance because most housing is privately produced and there are few mechanisms for commanding compliance by builders or local governments. Accordingly, it is important that estimates be seen as credible and feasible. The more realistic they are, the easier it is to secure respect for the process and gain local compliance. Therefore, the normative element of housing needs must be constrained by market and fiscal realities. Although it might be desirable to declare high household and homeownership rates for every group, excessively high estimates of housing needs would be dismissed as unrealistic. At the

same time, the estimates should reflect the goal of improving housing conditions, not merely extrapolating declines that may be under way.

Striking a balance between feasibility and normative goals is particularly challenging in the context of rapid demographic and housing market changes. The California case provides an excellent illustration, because both its population and housing occupancy patterns are rapidly changing. The results of our California analysis indicate that changes in both population composition and consumption rates within population subgroups greatly alter trends in household formation and homeownership and must therefore be factored into projections of housing needs.

This article has made explicit the choices to be made when developing estimates based on prospective population growth. One choice involves the degree of disaggregation to be used in the population projections that underlie estimates of housing needs. We have demonstrated the usefulness of detailed disaggregation of the population not only by race/ethnicity and age, but also by nativity and, for the foreign born, duration of residence in the United States. A second choice, which embeds both empirical and normative assumptions, involves selecting a method of projecting household formation and homeownership rates. Simply holding the rates measured in the latest census constant is inconsistent with trends that have been rising or falling over time.

This study has uncovered housing consumption trends that undercut the long-standard assumption of constant rates of household formation and homeownership. These trends call for a dynamic method that incorporates cohort differences, and our projections for California allow for such trends via dynamic cohort effects. The cohort framework provides the most credible basis for projecting rates because it builds in the accumulated trajectory of housing careers, but we also believe that moving toward the higher standard of previous decades (catch-up) is desirable. The careful balance to be struck is between feasibility/credibility on the one hand and desirability/policy aspirations on the other. Although this is no easy task, we hope that this article enables better choices by making more explicit the implications of alternative decisions.

Authors

Dowell Myers is Professor and Director of the Masters of Planning Program in the School of Policy, Planning, and Development at the University of Southern California. John Pitkin is President of Analysis and Forecasting, Inc. Julie Park is a project

manager in the School of Policy, Planning, and Development at the University of Southern California.

This article developed out of the California Housing Futures Project funded by the California Department of Housing and Community Development, the Fannie Mae Foundation, and the Great Valley Center. We wish to acknowledge the helpful comments of Patrick A. Simmons, Linda Wheaton, and two anonymous reviewers.

References

American Planning Association. 2002. *Growing Smart Legislative Guidebook*. Washington, DC.

Baer, William C. 1986. The Evolution of Local and Regional Housing Studies. *Journal of the American Planning Association* 52:172–84.

Bourassa, Steven C. 1994. Immigration and Housing Tenure Choice in Australia. *Journal of Housing Research* 5(1):117–37.

Calavita, Nico, Kenneth Grimes, and Alan Mallach. 1997. Inclusionary Housing in California and New Jersey: A Comparative Analysis. *Housing Policy Debate* 8(1):109–42.

California Department of Finance, Demographic Research Unit. 1998. *Race/Ethnic Population with Age and Sex Detail, 1970–2040*. Sacramento, CA. December.

California Department of Housing and Community Development. 1988. *Developing a Regional Housing Needs Plan*. Sacramento, CA.

California Department of Housing and Community Development, Housing Policy Development Division. 2000. *Raising the Roof: California Housing Development Projections and Constraints, 1997–2020*. Sacramento, CA.

Campbell, Paul R. 1996. *Population Projections for States by Age, Sex, Race, and Hispanic Origin: 1995 to 2025*. PPL–47. Washington, DC: U.S. Bureau of the Census, Population Division.

Clemmer, Richard B., and John C. Simonson. 1983. Trends in Substandard Housing, 1940–1980. *Journal of the American Real Estate and Urban Economics Association* 10:442–64.

Green, Richard K., and Michelle J. White. 1997. Measuring the Benefits of Homeowning: Effects on Children. *Journal of Urban Economics* 41:441–61.

Landis, John David, and Richard T. LeGates. 2000. Housing Planning and Policy. In *The Practice of Local Government Planning*, ed. Charles Hoch, Linda Dalton, and Frank So, 227–64. Washington, DC: International City and County Management Association.

Levy, Stephen. 2001. *California County Projections*. Palo Alto, CA: Center for Continuing Study of the California Economy.

Fannie Mae Foundation

Masnick, George S., and Zhu X. Di. 2000. *Updating and Extending the Joint Center Housing Projections Using New Census Bureau Population Projections.* Research Note N00–1. Cambridge, MA: Harvard University, Joint Center for Housing Studies.

McArdle, Nancy, and George S. Masnick. 1995. The Changing Face of America's Home Buyers. *Mortgage Banking*, December, pp. 58–65.

McCarthy, George, Shannon Van Zandt, and William M. Rohe. 2001. The Economic Benefits and Costs of Homeownership: A Critical Assessment of the Research. Working Paper No. 01–02. Research Institute for Housing America.

Myers, Dowell. 1988. Housing Market Research: Time for a Change. *Urban Land* 47:16–19.

Myers, Dowell. 1999. Cohort Longitudinal Estimation of Housing Careers. *Housing Studies* 14(4):473–90.

Myers, Dowell, William C. Baer, and Seong-Youn Choi. 1996. The Changing Problem of Overcrowded Housing. *Journal of the American Planning Association* 62:66–84.

Myers, Dowell, and SeongWoo Lee. 1996. Immigration Cohorts and Residential Overcrowding in Southern California. *Demography* 33:51–65.

Myers, Dowell, Isaac F. Megbolugbe, and SeongWoo Lee. 1998. Cohort Estimation of Homeownership Attainment among Native-Born and Immigrant Populations. *Journal of Housing Research* 9(2):237–69.

Myers, Dowell, and Julie Park. 2002. The Great Housing Collapse in California. Washington, DC: Fannie Mae Foundation.

Noll, Paul F., William O'Dell, and Marc T. Smith. 1997. Florida's Affordable Housing Needs Assessment Methodology. *Journal of the American Planning Association* 63:495–508.

Pitkin, John. 2000. Projections of the Population of California by Nativity to 2020. A California Demographic Futures Project Working Paper. University of Southern California. Also available at <http://www.usc.edu/sppd/futures>.

Pitkin, John. 2002. *Changes in Population and the Number of Households and Homeowners in California, 1980–1990: A Components of Change Analysis.* World Wide Web page <http://www.usc.edu/schools/sppd/futures>.

Pitkin, John R., and George S. Masnick. 1980. Projections of Housing Consumption in the U.S., 1980 to 2000, by a Cohort Method. *Annual Housing Survey Studies*, no. 9. Washington, DC: U.S. Department of Housing and Urban Development.

Pitkin, John, and Dowell Myers. 1994. The Specification of Demographic Effects on Housing Demand: Avoiding the Age-Cohort Fallacy. *Journal of Housing Economics* 3:240–50.

Pitkin, John, and Patrick A. Simmons. 1996. The Foreign-Born Population to 2010: A Prospective Analysis by Country of Birth, Age, and Duration of U.S. Residence. *Journal of Housing Research* 7(1):1–31.

Siegel, Jacob S. 1972. Development and Accuracy of Projections of Population and Households in the United States. *Demography* 9(1):51–68.

Texas State Data Center. 2000. *Projections of the Population of Texas and Counties in Texas by Age, Sex, and Race/Ethnicity for 1990–2030*. Population Estimates and Projections Program. College Station, TX.

U.S. Bureau of the Census. 1983. *1980 Census of Population and Housing: Public-Use Microdata Samples*. Washington, DC.

U.S. Bureau of the Census. 1993. *1990 Census of Population and Housing: Public-Use Microdata Samples*. Washington, DC.

U.S. Bureau of the Census. 1996. *Projections of the Number of Households and Families in the United States: 1995 to 2010.* Current Population Report Series P25–1129. Washington, DC.

U.S. Bureau of the Census. 2000a. *2000 Census of Population and Housing. Summary Tape File 1.* Washington, DC.

U.S. Bureau of the Census. 2000b. *Projections of Resident Population by Race, Hispanic Origin, and Nativity: 1999 to 2010.* Internet release January 13, 2000. Washington, DC.

Varady, David P. 1996. Local Housing Plans: Learning from Great Britain. *Housing Policy Debate* 7(2):253–92.