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Publication Date

1980-09-01

Peer reviewed



Institute of
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Economic Research

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THE DEMAND FOR HOUSING
UNITS IN THE 1980s

BY

KENNETH T. ROSEN

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THE DEMAND FOR HOUSING UNITS IN THE 1980s

by

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September 1980

Working Paper 80-14

Center for Real Estate and Urban Economics

This research was supported in part by the 20th Century Fund in New York City. Not for quotation without the author's permission.

THE DEMAND FOR HOUSING UNITS IN THE 1980s

One of the most commonly perceived "facts" about the housing market is that the 1980's will be a period of spectacularly high levels of housing demand. According to this view, a demographic surge in the 1980's, resulting from the maturation of the post-World War II "baby boom", will lead to an unprecedented demand for housing units in the 1980's.

In our view this conventional wisdom, while essentially correct, can be misleading to policy makers and the housing industry because of its emphasis on the certainty of this demographic demand. While there have been numerous estimates of "housing need"* which have received extensive publicity among private decision makers and governmental policy makers, there is substantial reason to believe that the estimates prepared by most analysts are deficient in that they do not take into account the impact of changing economic conditions on housing need.

The fundamental problem arises from the confusion of the concept of housing need with "effective housing demand." Housing need is usually defined as the sum of demographic components (population growth and household formation rates), a replacement component (arising from depreciation, accidental losses, and an upgrading of the housing stock), and a miscellaneous component (comprised of additional vacancies to meet the mobility needs of households and the seasonal and second home market). The need or demand represented by each component is usually calculated by constructing a trend extrapolation on past data.

*Estimates of Housing Needs 1975-1980, Committee on Banking, Housing, and Urban Affairs, September 1975, summarizes the key need estimate studies.

The concept of effective housing demand is substantially different in that the basic trends can be altered or even reversed by changes in economic and sociological conditions on public policy parameters. In addition, since effective housing demand is not merely a function of deterministic demographic factors but rather a function of stochastic events, there is a substantial element of uncertainty in demand forecasts. These elements of uncertainty are often deceptively hidden in forecasts of housing need.

This chapter will carefully analyze housing demand by component in the 1980's, emphasizing the assumptions implicit in any projection. First, an analytical framework for each demand component will be derived. This will be followed by a review of demand in the 1970's and then a set of projections for the 1980's will be provided. Finally, the range of projections for each component will be combined to produce a range of estimates of aggregate demand for housing units in the 1980's.

A. Demographic Demand for Housing

1. Population and Age Distribution of Population

Of all the factors influencing the nature and extent of housing demand, the size, age distribution, and growth rate by age group of the population are the most crucial. For a ten year projection of housing demand, in fact, only a segment of the total population is especially relevant. Specifically, that part of the population which is now part of, or will enter, the home purchase or rental market as a separate household unit in the next decade--basically the population

presently over age 10, is the focus of attention. This research attention contrasts with work of economic demographers who focus on the fertility component of population change. This is less relevant to housing analysts since the population that will demand housing in the next decade is already born. Thus, short-term birth rate changes will not alter the number of housing units demanded, although these changes may have some influence on the size and possibly the location of units, as a result of changes in family size.

Since birth rate variations will not greatly affect housing demand in the 1980's, there are only two major factors that can change the size of the "housing relevant" population for the next decade--a dramatic variation in the death rate or a major change in net international immigration. The national death rate has been declining moderately for the last decades and should continue to do so in the future, although medical breakthroughs or environmental factors may have some impact. Barring any major shifts in immigration policy, immigration's increment to the housing relevant population should also continue to be predictable, although any changes in national policy towards legal and illegal immigrants could, of course, have an impact on demand from this source.

In terms of the age distribution, the age profile of the housing relevant population on a national basis is known with a fair amount of precision for the next decade. The impact of the post-World War II baby boom on housing (and other) markets could have been generally anticipated by an analysis which included demographic factors. Table I

Table 1

Age Distribution of the Population in 1970's

	July 1, 1979	April 1, 1970	Population Change, 1970-1978	
			Number	Percent
All Ages	220584	204335	16250	8.0
Less than 5 years	15649	17163	-1514	-8.8
5 to 13	30647	36675	-6028	-16.4
14 to 17	16276	15854	422	2.7
18 to 24	29285	24455	4830	19.7
25 to 34	35024	25146	9879	39.3
35 to 44	25136	23214	1923	8.3
45 to 54	22957	23254	-296	-1.3
55 to 64	20952	18603	2350	12.6
65 and over	24658	19972	4685	23.5

Source: U.S. Bureau of the Census, Current Population Reports, Series P-20, No. 350, May 1980.

shows the startling, but highly predictable changes in the age distribution which occurred in the 1970's. The table shows a sharp decline in population under thirteen of nearly 7 million people. In contrast the population in the eighteen to thirty-four age group increased by nearly 15 million people.

This shifting age distribution was directly caused by the changes in the numbers of births two and three decades ago. Chart I illustrates the dramatic changes in the number of births in the past three decades. The chart shows that while there was an initial surge in births following World War II, there was also an important "second wave" of the baby boom in the mid-1950's which peaked in the period from 1957 to 1962. The number of second wave births was nearly 600,000 per year higher than in the 1947-1950 period. In the early 1960's this second wave came to an abrupt halt with a "baby bust" which lasted through the mid-1970's. During this period the number of births was over 1 million less per year than at the peak of the "baby boom". Since 1977 there has been a small upturn in births representing a "baby blip".

The impact of the baby boom on the age distribution of the population can be looked at it in two ways. The conventional way of analyzing the changing age distribution of the population is to look at the number and the net change in people in each age class. Table I provided these number through the 1970's, while Table II compares in more summary form the decade of the 1980's with the 1970's. The population aged 15-24 will show an unprecedented

CHART I

BIRTHS

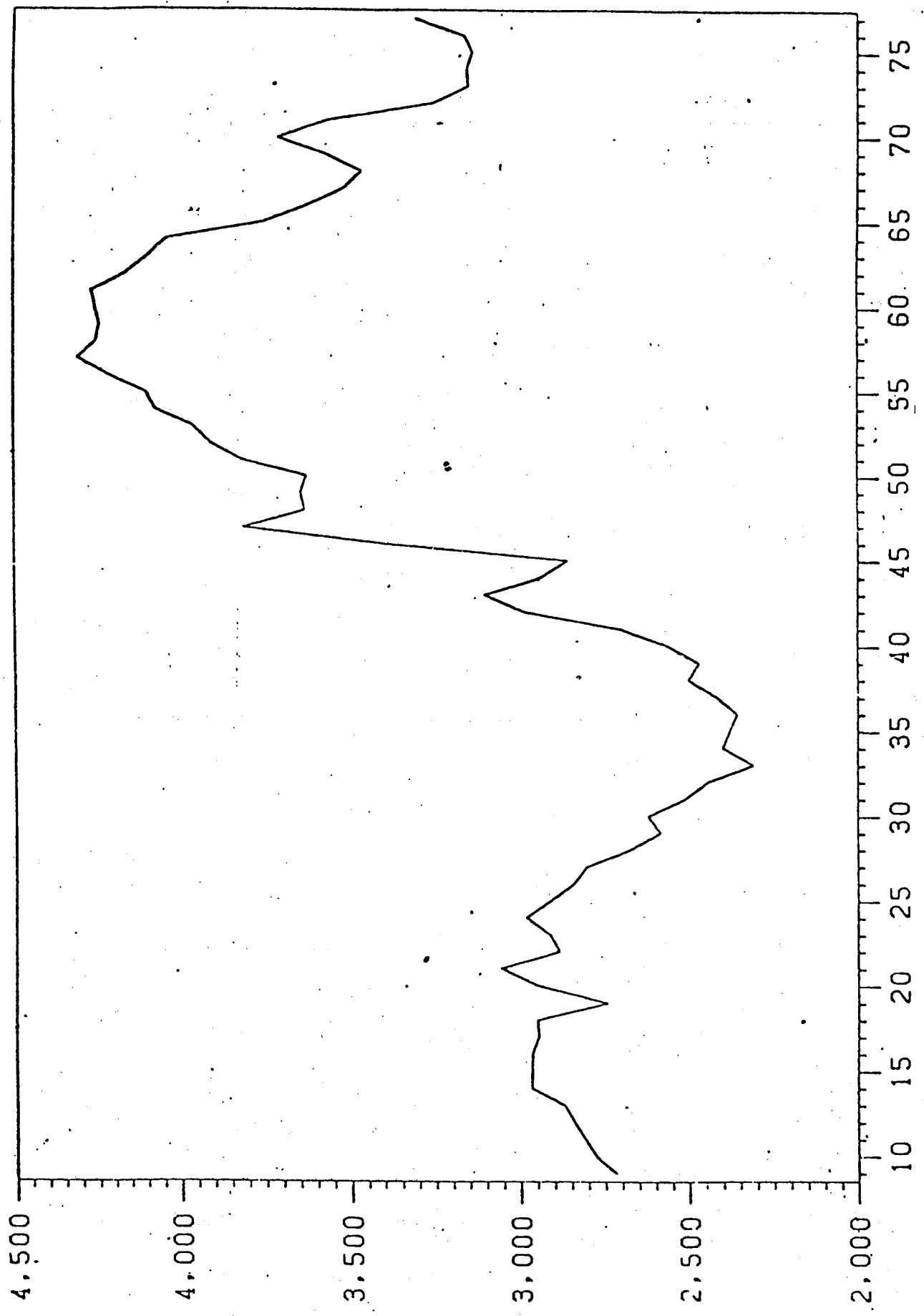


TABLE II: Age Distribution of Population; 1970 - 1990

	1970	1980	1985	1990	Population Change			
					1970 - 1980		1980 - 1990	
					<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
15-24	35776	41224	38214	34427	+5448	+15.2	-6797	-16.5
25-34	25078	36000	39687	40914	+10922	+43.5	+4914	+13.7
35-64	64993	69540	75493	82602	+4547	+ 7.0	+13062	+18.8
65+	20089	25031	27409	29928	+4942	+24.6	+4897	+16.4
All over 15	145936	171795	180803	187871	+25859	+17.7	+16076	+9.4

decline of nearly seven million people over the decade of the 1980's.

This compares with a growth of about five million people in the 1970's. This clearly reflects the drop in births that occurred after 1962. The ramifications of this population decline will be felt most by firms and institutions specializing in providing goods and services to this age group, such as colleges and universities. The impact on housing markets, especially the rental and mobile home markets, will also be substantial as these types of housing units are traditionally demanded by young households (see Chapter 3 for details).

The growth rate in the population aged 25-34 also shows a dramatic change in the 1980's. This group which grew by nearly 11 million people in the 1970's will add only five million people in the 1980's, with nearly 80% of these people added by 1985. This group, commonly thought of as potential first-time home buyers, will thus show a decisive slow-down in growth in the 1980's, especially after 1985.

In 1980's, however, the post-war baby boom bulge shows up most stunningly in the 35 to 64 year old age group. This group which increased by only 4.5 million in the 1970's will add over 13 million people in the 1980's. While this group is still an important source of the stock demand for housing, most people in this group are already occupying a housing unit prior to entering this age group. While the younger portion of this group, aged 35-44, may still be switching from owner to renter

status, following the life cycle hypothesis, their contribution to incremental housing unit (as contrasted with housing space) demand is relatively small.

The final population age group that we have utilized, population over age 65, continues to show a rapid growth. This group added nearly five million people in the 1970's and will add slightly over five million people in the 1980's. As a result, the proportion of people over age 65 will continue to rise substantially in the 1980's.

Combining the population age categories to obtain an overall population change profile provides some unexpected results. The growth in population aged 15 or more will decline dramatically in the 1980's. The population growth over age 15 was nearly 26 million between 1970-1980, and will grow only 16 million between 1980-1990. The five year comparisons are even more revealing. The adult population grew 13.5 million between 1970-1975, 12.4 million between 1975-1980, is projected to grow 9.0 million between 1980-1985, and growth is projected to slow markedly to 7.0 million between 1985-1990.

However, if we exclude the population aged 15 to 24 from our comparison, the numerical growth of adult population between the decades becomes comparable. Table III shows the five year numerical growth rate comparisons by age group. It is clear that the growth of the population under age 35 shows a sharp decline in the 1980's, especially in the second half of the 1980's. This measure of demographic change (net population movement by age class) does not

TABLE III: Five Year Growth in Population by Age

Age Groups	1970-1975	1975-1980	1980-1985	1985-1990
15-24	4196	1252	-3010	-3787
25-34	5684	5238	3687	1227
35-64	1290	3307	5953	7109
65+	2331	2611	2378	2519
All ages over 15	13501	12408	8988	7068
All ages over 25	9305	11155	11998	10855

support the bullish projections of housing analysts. We now turn to an examination of an alternative measure of population flows which provides a more positive interpretation for housing demand.

Gross Flows in Age Distribution of the Population

In contrast to the net flows measure of population change, a gross flow measure of the age distribution of the population shows a somewhat more dramatic and later peaking in the high potential home demander group. Utilizing historical birth statistics and assuming very low mortality rates for the 25-34 group, we can calculate a gross flow of population by age. Table IV shows these gross flows number for the 1970's and 1980's. It shows the largest number of people turning age 25 in the 1980-1985 period and the largest number of people turning age 30 in the 1985-1990 period. Over 4.2 million people per year will turn 25 or 30 in these time periods versus about 3.6 million people per year in the mid 1970's. Thus, the demand by first time household and home buyers looks extremely strong. On the other hand, the number of people moving out of the 25-34 year old group also rises dramatically in the 1980's. Thus, the gross movement into this group minus the gross movement out of the group declines dramatically in the 1980's and in fact turns sharply negative. The net movement into this category was over 1.1 million per year in the mid 1970's, drops to 600,000 per in the early 1980's and turns negative by 1989. Thus, in a gross inflow sense, with many first time home buyers coming onto the market,

TABLE IV: Gross Flows of Population by Age

	Population Turning 25	Population Turning 30	Population Turning 35	Gross/ins -Gross/outs (1) - (3)
1970	2858	2559	2377	481
1971	3411	2703	2355	1056
1972	3817	2484	2413	1404
1973	3637	3104	2496	1141
1974	3649	2939	2466	1183
1975	3632	2858	2559	1073
1976	3823	3411	2703	1120
1977	3913	3817	2989	924
1978	3965	3637	3104	861
1979	4078	3649	2939	1139
1980	4104	3632	2858	1246
1981	4218	3823	3411	807
1982	4308	3913	3817	491
1983	4255	3965	3637	618
1984	4258	4078	3649	609
1985	4268	4104	3632	636
1986	4167	4218	3823	344
1987	4098	4308	3913	185
1988	4027	4255	3965	62
1989	3760	4258	4078	-318
1990	3606	4268	4104	-498

the housing market looks strong in the 1980's. On a net basis it looks far less strong especially in the late 1980's. In fact, housing demand does not depend on the age distribution of the population alone, but rather on the interaction of age distribution effects with household formation tendencies of households. A direct translation of the age distribution of the population to housing demand would be a mistake, for it is, of course, subject to a fairly wide range of uncertainty resulting from the forces which influence household formation. We now turn to an analysis of the household formation process.

2. The Household Formation Process

The demand for housing is determined by the manner in which the population divides up into households. A household is defined as a group of people occupying a housing unit. Households are classified by the relationship between household members and the household head. A family household refers to the head of a household and all other persons living in the same household who are related to the head by blood, marriage, or adoption. A primary individual household refers either to a household head living alone or to one living with non-relatives. Thus, the number and type of households depends not only on the age structure of the population but also on the way in which the population establishes or breaks family ties and groups itself into shelter consuming units.

By definition the growth in the number of households must equal the growth in the occupied stock of housing. Thus a direct measure of the number of housing units demanded is the number of households. Household growth depends not only on the population growth and the age distribution of the population, but also on the tastes and preferences of the population concerning marital status and living arrangements, on growth in real income, and on the price and availability of housing. In the past decade, the propensity of the population to group itself into households has undergone a major upward shift. Large numbers of people have opted because of economic and sociological forces, to form primary individual households when they previously would have been submembers of family households. These primary individual households result from young individuals setting up their own households, delaying marriage and/or living with a person of the opposite sex, from the uncoupling of existing households by divorce, and from the preference of surviving elderly spouses to retain their own independent living quarters. This dramatic increase in primary individual households in each age group of the population has lead to a large increase in the demand for housing units.

The formal accounting translation of the age distribution of the population into households is accomplished through a concept known as a "headship rate." The headship rate shows the ratio of the number of household heads in a particular age group to the population in that age group. The headship rate can also be

calculated in terms of household type. The following equation sets out the precise translation formula:

$$HH_{ij} = hh_{ij} * POP_j$$

This equation states that households of type i and age group j (HH_{ij}) equals the headship rate for household type i and age group j (hh_{ij}) times the population in age group j. As stated previously, since POP_j is fairly well determined nationally for the next ten years, the major source of uncertainty in the demand for housing units concerns the path of household headship rates, and in particular whether the population forms family or individual households. A switch towards individual households greatly increases the household yield for each population group and so increases the demand for housing.

Research done by the author and Dwight Jaffee* indicates that three key factors determine secular trends in age-specific headship rates. The first factor is the level of real per capita income and in particular the level of real per family income which provides the economic resources for the family or individual to maintain a housing unit. While there has been a rise in real income in the past decade, there has also been a substantial redistribution of income among household types. The sharp rise in the female labor participation rate is especially important in this regard as it has allowed female headed households to maintain their own housing units. Also, the relative

* Jaffee-Rosen long-run model of housing and household formations.

increase in social security benefits since the early 1970's has contributed to the ability of elderly persons to maintain individual household units.

These basic trends in real income have been complemented by a second factor, a sharp decline in the relative cost of operating a housing unit. The real price of a rental housing unit has fallen by nearly 35 percent over the past decade. This sharp drop in the price of household formation has, in combination with rising real income, encouraged formation of primary individual households.

These two economic factors are further complemented by a third fundamental determinant of household formation, a strong sociological trend towards individual fulfillment. The postponement of marriage by the maturing individuals born during the post-war baby boom, the increased prevalence of social experimentation as reflected in POSSLQ (persons of opposite sex sharing the same living quarters) and PSSSLQ (persons of the same sex sharing the same living quarters) couples, and the surge in the divorce rate all work in the direction of increasing primary individual headship rates and increasing demand for housing units. This construct of headships rates as a function of economic and sociological factors is formalized in functional notation in below.

$$\frac{hh_{ij}}{POP_j} = f(Y_{ij}, R/CPI, PDIV)$$

This equation states that headship rates based on age and household type are a function of real income, housing costs relative to the overall CPI, and the divorce rate as a proxy for sociological forces.

3. Household Formation Patterns in the 1960's and 1970's

This theoretical view of the household formation process is strongly supported by the available empirical evidence.

Econometric evidence from the Jaffee-Rosen model supports this conceptual framework. A less formal examination of the data provides equally convincing support for this view. Table V shows the age-household type specific headship rates at five year intervals from 1960. These data show a dramatic rise in the proportion of individuals maintaining their own households. In the population under age 35 there has been nearly a fourfold increase in the proportion of the population having separate households. In terms of actual numbers of households this effect is even more dramatic because these are the baby boom age groups. Somewhat less dramatic but still highly significant is the nearly one-third increase in the proportion of people over age 35 in primary individual households.

By contrast, while the individual headship rate has soared, the family headship rate has remained largely unchanged in the same period. These two trends have resulted in a dramatic increase in the "household yield" for the population as a whole and is characterized by a reduction in family size as well as a reduction

Table v
Age Specific Household Headship Rates,
1960-1978

	<u>Primary Individuals</u>				<u>Primary Families</u>			
	<u>24 or less</u>	<u>25-34</u>	<u>35-64</u>	<u>65 and over</u>	<u>24 or less</u>	<u>25-34</u>	<u>35-64</u>	<u>65 and over</u>
1960	.013	.026	.062	.196	.094	.402	.455	.370
1965	.017	.031	.066	.229	.097	.417	.459	.368
1970	.025	.045	.073	.262	.099	.426	.467	.356
1975	.043	.076	.080	.279	.103	.414	.467	.361
1978	.059	.106	.091	.295	.094	.399	.465	.346

Source: "Marital Status and Living Arrangements"
U.S. Bureau of the Census, various issues.

in the proportion of overall households who were classified as families. The young individual who moves out of her parents' home has increased the individual household headship rate without decreasing the family headship rate. A divorce in which children are present has the same effect, for the spouse with one or more of the children has remained a family household, while the spouse without children has become a primary individual household. It is crucial to note that these are not arbitrary definitions but actually represent an increase in the demand for separate housing units. This increase in the household headship rates is directly translated into an increase in the demand for housing units.

Table VI illustrates the economic and sociological trends that have accompanied this sharp rise in primary individual household headship rates. Despite the decline in real income in 1974-1975, the fundamental trend in the economy over the past two decades and in the past four years has been for rising real disposable income on both a per capita and a per household basis.

During the same time period there has also been a remarkable drop in the relative (to the CPI and home owning) cost of a rental housing unit. Since this is the main type of unit occupied by primary individual households the causal relationship seems clear. In contrast the cost of homeownership (using the CPI measure which is not adjusted for tax benefits or capital

Table VI
Economic and Sociological Factors
Influencing Household Headship Rates

	<u>Real Disposable Income per Person, 1972 Dollars</u>	<u>Real Disposable Income per Household, 1972 Dollars</u>	<u>Divorces Family House- holds</u>	<u>Rent Over- all CPI</u>	<u>Female Labor Participation Rate</u>
1960	2695	9152	.0086		
1965	3152	10576	.0099		
1970	3618	11569	.0135		
1975	4035	12017	.0184		
1978	4430	12627	.0196		

appreciation) has slightly exceeded the overall inflation rate during this period. Since the relevant housing choice for most families is homeownership, the flat headship rate trends are consistent with this price data.

In terms of sociological factors the doubling of the divorce rate since 1965 is a major causal factor in the increase in individual household formations in the 25-64 year old age group. This dramatic surge in divorce rates must be viewed as fundamentally altering the nature of the housing consumer. Besides increasing the number of individual households, this high divorce rate has produced a household with a distinctive history of housing demand. A substantial number of divorced households have previously owned their own home and so have experienced both the investment and tax advantages of homeownership. As a result, a divorce is likely to produce a situation in which one spouse attempts to keep the house and the other spouse would also attempt to retain his ownership advantage by purchasing another unit.

The fundamental relationship between marital instability and housing demand can be further expanded to include several more speculative hypotheses. The rise in the female labor force participation can partly be attributed to the increased need of single, married, and divorced females to support or help support the housing unit. As a primary individual the relationship is clear, a job is a necessary condition to set up a household, unless

one is receiving welfare or social security benefits. In the case of the traditional family household, the two-earner household may be essential to building up the downpayment and qualifying for the mortgage loan involved in homeownership. In this work environment the female may find a more appealing marital partner (of course the male may also find the new professional female more attractive than his present partner). In addition, this income provides the female with financial ability to live alone. Thus one could speculate that the two-earner family necessary to support the house has also increased marital instability which in turn has increased household formations and so housing demand.

While the relationship between these sociological trends and the housing market are somewhat speculative there can be little dispute concerning the fundamental restructuring of the American Family into smaller and more numerous household units. Table VII and VIII summarize the distribution of households by type for recent years. The data confirms that there has indeed been a massive shift towards non-traditional types of households that was implied by our headship rate chart. The traditional husband and wife family units have been the slowest growing type of household unit showing only a 5.9% increase from 1970 to 1978. On the other hand, nonfamily households showed a 60% increase during the same time period, divorced female households increased 115%, single female households increased 102%, and persons of

Table VII
Households by Types

	<u>1978</u>	<u>1970</u>	<u>1960</u>	<u>Percent Change</u> <u>1970 to</u> <u>1978</u>	<u>1960 to</u> <u>1970</u>
Total Households	76030	63401	52799	19.9	20.1
Family	56958(74.9)	51456(81.2)	44905(85)	10.7	14.6
Husband-Wife	47357(62.3)	44728(70.5)	39254(74.3)	5.9	13.9
Male Headed (no Wife)	1564(2.1)	1228(1.9)	1228(2.3)	27.4	--
Female Headed (no Husband)	8037(10.6)	5500(8.7)	4422(8.4)	46.1	24.4
Non-Family Households	19071(25.1)	11945(18.8)	7895(15.0)	59.7	51.3
Living Alone	16715(22.0)	10851(17.1)	6896(13.1)	54.0	57.4
Living with Person of Same Or Opposite Sex	2356(3.1)	1094(1.7)	999(1.9)	115.4	9.5
Unmarried Couples with No Children	865(1.1)	327(.5)	--	164.5	--

Source: U.S. Bureau of the Census, Current Population Reports, Series P-20,
No. 336, April 1979.

Table VIII
Marital Status of Female Householders
With No Husband Present

	<u>1978</u>	<u>1970</u>	<u>1960</u>	<u>Percent Change</u> <u>1970 to</u> <u>1978</u>	<u>1960 to</u> <u>1970</u>
Total	8037	5580	4196	44.0	33.0
Single	1231	610	487	101.8	25.3
Married, Spouse Absent (Separated, Other)	1742	1324	914	31.6	44.9
Widowed	2362	2389	2093	-1.1	14.1
Divorced	2703	1258	702	114.9	79.2

Source: U.S. Bureau of the Census, Current Population Reports, Series P-20,
No. 336, April 1979.

opposite sex sharing the same living quarters rose an astounding 164%. In terms of absolute growth, nonfamily and single parent headed households accounted for 9.8 million out of the 12.6 million households formed in the 1970 and 1978 period. This restructuring of the American Family has had a major effect on the aggregate level of housing demand as shown earlier and on demand in particular housing submarkets. We will now turn to the analysis of housing formation in the 1980's.

4. Household Formations Projections for the 1980's

The projection of household formations for the 1980's depends crucially on whether the dramatic increase in household headship rates in 1970's continues into the 1980's.

a. Illustrative Trend Projections

To illustrate the critical interaction of headship rates and the age distribution of the population we will make three trend projection assumptions: (1) there will be a percentage increase in headship rates comparable to the 1970's, (2) there will be no further increase in headship rates in the 1980's, and (3) the headship rate will increase in the 1980's at about one-half the rate of the 1970's. These illustrative calculations are shown in Table IX. Both headship rates and actual households are shown by age and type of head. The sharp differences in net change in households depending on headship rate assumptions are shown in Table X.

TABLE IX: Household Projections: Alternative Trends

Household Types	<u>Trend of the 1970's</u>			<u>No Trend</u>	<u>½ Trend of 1970's</u>
	1970	1980	1990	1990	1990
<u>Headship Rates</u>					
Primary Family					
15-24	.099	.088 ^E	.071	.088	.0795
25-34	.426	.389 ^E	.355	.389	.372
35-64	.467	.469 ^E	.471	.469	.470
65+	.355	.335 ^E	.316	.335	.325
Primary Individual					
15-24	.025	.072 ^E	.207	.072	.140
25-34	.045	.116 ^E	.299	.116	.208
35-64	.073	.089 ^E	.108	.089	.098
65+	.261	.295 ^E	.333	.295	.314
<u>Numbers of Households</u>					
Primary Family	1980 ^E	1990	1990	1990	
15-24	3628	2444	3030		2737
25-34	14009	14524	15916		15220
35-64	32640	38906	38740		38823
65+	8399	9458	10025		9727
Primary Individual					
15-24	2953	7126	2479		4820
25-34	4166	12233	4746		8510
35-64	6226	8921	7352		8094
65+	7381	9966	8829		9397

TABLE X: Net Change in Households , 1980's Alternative Trends

	Trends of 1970's	No Trend	$\frac{1}{2}$ Trend of 1970's
<hr/>			
Primary Families			
15-24	-1184	-598	-891
25-34	515	1907	1511
35-64	6266	6100	6183
65+	1059	1626	1327
Total	6656	9035	8130
Primary Individuals			
15-24	4173	-474	1867
25-34	8167	590	4344
35-64	2695	1126	1868
65+	2585	1448	1956
Total	17619	2690	10035
Total, All Households	24275	11725	18165
<hr/>			

These tables show that if the headship rate trends of the 1970's were to continue, we would have a boom in the demographic demand for housing units with over 2.4 million units demanded per year. Individual households would provide nearly two-thirds of the incremental demand for housing. In contrast, if we just stayed at the headship rates of the 1970's, the incremental demand for housing would be only half as large, 1.2 million units per year. In this case primary family households would account for over 80% of the incremental demand for housing. If we take a mid-point case, with headship rates rising at 1/2 of the trend of 1970's, demographic demand for housing will be 1.8 million units per year, with a roughly equally split between primary family and primary individual households.

b. Census Household Projections for the 1980's

This trend extrapolation methodology is also essentially the technique used by the Census Bureau to forecast household formations over the next decade. The census technique merely takes various past trends in headship rates and extrapolates them out for the next decade. The Census provides five forecasts of households. Series B, one of the two basic Census projections, uses the trend in headship rates from 1960 to 1978 to project formation. Series C, the other basic Census series, uses the trend in headship rate from 1966 to 1980. Series A and D projections are weighted averages of the observed headship

TABLE XI: Census Household Projections

	1980	1990	Change 1990-1980
Series A	80135	98950	18815
Series B	79870	96653	16783
Series C	79704	96792	17088
Series D	79349	92394	13045
Series K	79092	90438	11346

Source: U.S. Bureau of the Census, Current Population Reports, P-25 No. 805-
May 1979.

rates in 1978 and the Series B projections. The weights used to obtain the Series D proportions were one-third for Series B and two-thirds for 1978 headship rates. To derive Series A, the weights were $4/3$ for Series B and $1/3$ for 1978 headship rates. The final set of projections, Series K, was based on the assumption that the levels of marital status and headship rates in 1978 would persist through the 1980's.

The Census Bureau's forecasts of household formation from 1980 to 1990 for each of the five series are shown in Table XI. The range of results are quite similiar to our own trend projections. Our high trend projection of household formations appear much higher than the Census projections, as we extrapolate the headship rate trends of the 1970's versus their longer trend calculation. Series A thus shows an increment of 1.9 million households per year. Series B and C appear comparable to our middle projection which uses $1/2$ the trend of the 1970's. They show a growth of about 1.7 million households per year. Series K is comparable to our no-trend scenario, and shows a growth of 1.1 million households per year.

This wide range in projections shows the tenuous nature of housing need projections based on demographic demand. They are critically dependent on the trend projection assumptions that one adopts and so are by no means certain.

c. Econometric Projections of Households for the 1980's

An alternative methodology for forecasting household formation is to utilize an econometric model of household formation behavior. This author, in conjunction with Professor Dwight Jaffee, has developed such an econometric model. As set forth earlier in this chapter, the key variables influencing changes in household headship rates are: changes in real disposable income, changes in the cost of maintaining a separate housing unit (proxied by the rental component of the CPI), and changes in divorce and marriage rates. Separate equations were estimated for each age group and household type. As might be expected, primary individual and young household groups are most sensitive to economic variables. The sociological variables also have a large impact on young households.

In projecting household formations, the econometric technique provides a way of quantifying the impact of economic conditions which might differ in the forecast period from the historical period. In the 1980's we expect income growth to be lower, "real rents" to be higher, and the growth in divorce rates to be lower than in the 1970's. This last factor is especially important as we think that the divorceable pool of households is nearly exhausted. Thus, these changes should reduce household headship rate growth relative to the 1970's

trend. While this is our base economic view, it is also possible that the economy could perform significantly better or worse than we are expecting. Using an econometric model, household formation projections can be made conditional on any set of economic assumptions. Table XII provides alternative household formation forecasts conditioned on these alternative economic scenarios. The econometric forecasts of household formation fall in a narrower range than the Census or our trend forecasts. They also clearly show the sensitivity of household formations to economic conditions. The high and low economic scenarios show a difference of nearly 3.5 million household formations over the decade. Household formations range from 16.2 million in the low growth economic scenario, to 19.1 million in the high growth economic scenario. These numbers are quite similar to the Census A, B, C series and, our 1/2 of the 1970's trend series. This is really not surprising as the econometric technique has trends and cyclical effects built into the regression parameters.

5. Summary of the Demographic Demand for Housing in the 1980's

The demographic demand for housing in the 1980's, especially in the first half of the decade, barring severe economic conditions, should be quite strong.

Econometric projections and reasonable trend extrapolations show household growth, which can be translated directly into the

TABLE XII: Econometric Projections of Household Formations Conditional on Economic Conditions

	1980	1990	Change 1980-1990
High Economic Growth			
Real Disposable Income	-	-	3% Per Year
Rental Component CPI - Overall CPI	-	-	1% Per Year
Households	79752	98802	19050
Base Economic Growth			
Real Disposable Income	-	-	1% Per Year
Rental Component CPI - Overall CPI	-	-	0 Per Year
Households	79401	96854	17453
Low Economic Growth			
Real Disposable Income	-	-	-.25% Per Year
Rental Component CPI - Overall CPI	-	-	-.9% Per Year
Households	79261	95479	16218

demand for housing units, to be in the 1.6-1.9 million range in the 1980's. The growth in population and the changing age distribution of the population account for 1.2 million of the household growth. This portion of housing demand is fairly certain. The remaining .4 to .8 million annual growth in households is a result of household headship rate increases. These are in turn a function of economic conditions and sociological trends. In any case the demographic demand for housing in the 1980's even in the pessimistic case does look strong.

B. Replacement Demand for Housing

In addition to the demand for housing units resulting from household growth a substantial portion of housing demand results from the removal of housing units from the existing stock. The removal component of housing demand is far more difficult to measure than demographic demand. The major problem arises from the inability to obtain adequate data on changes in the quality and quantity of the housing stock. The major source of replacement demand arises from removals from the stock as a result of demolitions, fires, floods, and wind storms. In addition, conversion of residential units to non-residential units and the merging of residential units can also increase the net loss of housing stock. On the other hand, the conversion of non-residential units to residential units, the subdividing of existing

residential units, and the rehabilitation of condemned units, can decrease the replacement demand for housing by increasing and preserving the housing stock. While these types of conversion and alteration activity have been a major source of housing supply during certain periods of our history, (e.g. the great depression period in the 1930's and possibly at present) they are extremely difficult to document. The best source of housing stock data, the Annual Housing Survey (AHS), does make an attempt to separate permanent and retrievable losses to the housing stock. Permanent losses are units which can never return to the housing inventory as result of demolition or natural disaster. Retrievable losses, on the other hand, move in and out of the stock as a result of conversions, subdivisions, and rehabilitations. Utilizing the AHS we can at least make some rough estimates of replacement demand for housing in the 1970's.

At this writing the most recent AHS report available is for 1977. These data illustrated Table XIII shows that gross removals between 1970 and 1977 were 5.676 million units, while gross additions due to conversions, alternations, and rehabilitations were 2.140 million units. The net loss to the stock was 3.536 million units or .471 million units per year. Thus, the average net loss per year was .62% of the housing stock.

Using the full set of Annual Housing Survey Reports for 1970 to 1977 an implicit net removal rate can be calculated

Table XIII

Source of the Housing Inventory

1970 - 1977

All housing units, October 1977	82420
All housing units, April 1970	<u>70184</u>
Increase	12236
Units added by new construction	15772
Units lost (demolition, disaster and other means)	- 5676
Units gained (other means)	+ 2140

Source: Annual Housing Survey, Table B, page XV.

for each year since 1973. This data presented in Table XIV, appear to show that there has been a declining trend in net removal rates since the early seventies. They also show a great deal of volatility, moving from .96% per year all the way to a net appreciation rate of .27% per year. This volatility clearly reflects economic and housing market conditions which crucially influence the year to year replacement rate.

While the data and the theory about changes in the existing stock are not well developed, some generalizations can be made. Units lost to the stock because of demolition are related to three basic factors: government removal policies, the quality and age of the stock, and the level of new housing production. Government programs such as urban renewal, slum clearance, and urban highway programs all would raise the gross removal rate. On the other hand, urban homesteading and stock conservation programs would tend to reduce the removal rate. In the 1950's and 1960's the Federal and State governments were involved in a number of removal type programs and so we experienced a fairly high removal rate. By the mid-1970's a number of these programs were being geared down and a number of stock conservation programs were being instituted. This fall in the gross removal rate appears to be reflected in our statistics in Table XIV.

Table XIV

Changes in Housing Stock

1970 - 1977

	1970*	1973	1974	1975	1976	1977
All Housing Units	70184	75969	77601	79087	80881	82420
Change in Stock	-	5785	1632	1486	1794	1539
Units Completed**	-	8249	2227	1653	1584	1858
Implicit Net Removals	-	2464	595	195	(210)***	319
Implicit Removal Rate	-	.96	.78	.25	(.27)	.39

Source: Annual Housing Survey

*Adjusted for 1970 Census Undercount

**Includes mobile homes and public housing.

*** () Implies net addition to the stock.

The second source of gross removals relates to the quality and age of the existing stock. The greater the portion of low quality old housing stock, the higher the removal rate. One of the dramatic developments of the two decades is that a combination of government programs and private market actions have greatly improved the physical quality of the housing stock. Table XV shows that by our estimates there has been a drop of over 35% in the number of physically inadequate or overcrowded housing units. While the measures we have used do not take into account neighborhood conditions or physical defects, other than inadequate plumbing, they indicate that the housing quality problem has been reduced. This is due, in part, to the elimination of nearly two million units built prior to 1960 and the addition of nearly 15 million new units. Table XV also shows the age distribution of the housing stock in 1970 and 1977. As a result, of the prior decades policies and activities we have nearly exhausted our pool of low quality housing stock -- with about 2.4 million units being classified as physically inadequate in 1979 versus nearly 5 million in 1970.

A final source of demolitions involves the the removal of units in order to allow the construction of new housing. During periods when there are high levels of new construction (especially multifamily construction) a higher number of older units are

Table XV

Quality of the Housing Stock

Lacking All Plumbing Facilities			
	1970	1977	1979 ^{e*}
Number of Units (000)	4398	2542	2072

More Than 1.51 Persons Per Room in Units with All Plumbing Facilities (Renter)			
	1970	1977	1979 ^e
Number of Households (000)	556	343	280

Year Structure Built		
	1977	1970
April, 1970 or later	14559	-
1965 - 1970	9344	8874
1960 - 1964	8108	8082
1950 - 1959	13767	14499
1940 - 1949	7993	8786
1939 or Earlier	26945	27458

Source: Annual Housing Survey.

* Estimates derived by extrapolating the trend from 1970-1977.

demolished to make room for this activity. In contrast, during periods of low levels of new construction this source of removals declines substantially. This pro-cyclical movement in the net removal rate is clearly reflected in the data in Table XV.

The second major element in the replacement demand for housing is of course conversions and alterations of the existing stock. This source of replacement demand involves the two way movement of units between residential and non-residential uses, and the two way movement between that portion of the stock temporarily not inhabitable due to condemnation, vandalism, or disaster. The net addition or loss to the housing stock from conversions and alterations is a function of public policy variables and overall market conditions. Presently public policy in a number of metropolitan areas has encouraged the conversion of non-residential structures to residential uses. Similarly, market response to high levels of aggregate demand and the high price of suburban housing relative to older central city housing have also made conversion and extensive rehabilitation more desirable. The combined effect of this conversion response is that by the late 1970's there were actually net additions to the housing stock from these sources. This contrasts to the early 1970's when conversion response led to net removals from the stock.

Taking into account all the factors discussed previously it appears that the replacement demand for housing (in terms of net removal rate) will be lower in the 1980's than during the past three decades. The very low net replacement rates of the late 1970's will become the normal rate in the 1980's. As we stated earlier public policy and market response has moved sharply in the direction of conservation and rehabilitation of the existing stock. In addition, by 1980 the number of occupied physically inadequate units had declined to slightly over 2 million units -- thus depleting the supply of removable stock. The only factors offsetting this downward pressure of net removal rates is the expected high levels of new production in 1980's, which would encourage site assembly removals. Our best estimate is the 1980's will see an average net removal rate of .4%, which translates into about 350,000 units per year. This contrasts with traditional estimates of the net removal rate which range from .7 to .9% per year, translating into 600-800,000 units per year. These differences are extremely large and again add to the uncertainty of housing demand in the 1980's.

C. Vacancy and Second Home Demand in the 1980's

1. Vacant Unit Demand

In a market supplied housing inventory there will always be a desirable level of vacant housing units. Vacancies are

desirable from the point of view of consumers who normally wish to move within and between metropolitan areas. They are also desirable from the view of sellers and landlords in that their housing units face a market price distribution rather than a single market price. Thus, there is an "optimal vacancy rate", while the sellers (and buyers) sample the market in the search process. Seeking better prices (for sellers or landlords) or lower costs (for buyers or tenants).

These supply and demand forces lead to three factors which influence the optimal level of vacant units: the mobility rate of the population, the expected variance of the price distribution, and the holding cost of vacant units. As the first two factors increase, optimal vacancy rate increases. As holding costs (interest, insurance, taxes) increase optimal vacancies would decrease.

In the past two decades there has been a general trend towards decreasing vacancy rates in the rental sector. The one exception was the rise in vacancy rates in the early 1970's coincident with the tremendous boom in apartment construction. During this period, mobility rates have been fairly constant, interest rates have risen dramatically, and in the late 1970's the expected

gain from holding vacant units has declined because of the spread of rent control. The net effect is that the optimal vacancy rate has probably declined substantially in the rental sector. This in part explains the decline in rental vacancy rates shown in Table XVI.

In the 1980's we would expect similar forces to be at work. Interest rates should remain high, rent control is likely to spread, and in contrast to the 1970's the mobility rate is likely to decline because of an aging population. As a result, the optimal rental vacancy rate will decline somewhat further in the 1980's. If the rental vacancy rate were to decline from 5% in 1980 to 4.5% in 1990, as we expect, it would mean that there would be no incremental demand for vacant rental units over the decade.

In the owner-occupied market the optimal vacancy rate is a function of similar factors. Since it is more costly for the typical household to hold an empty house than it is for a landlord to hold one empty apartment out of 25 units, the vacancy rent in owner-occupied housing is about 1/4 that of the rental sector (see Table XVI). In addition to being lower than the rental vacancy rate the owner occupied vacancy rate is also less volatile. Table XVI shows the movement in this series for the past two decades. In the 1980's we expect some continued decline in owner-occupied vacancy rates, which will on balance lead to little change in the demand for vacant units from this source.

Table XVI

Vacancy Rates

	Rental Vacancy Rate	Owner Vacancy Rate
1960	8.175	1.275
1961	8.700	1.400
1962	8.175	1.400
1963	8.200	1.550
1964	8.225	1.475
1965	8.250	1.575
1966	7.700	1.425
1967	6.850	1.350
1968	5.900	1.150
1969	5.475	1.025
1970	5.325	1.050
1971	5.450	0.975
1972	5.550	0.975
1973	5.775	1.050
1974	6.175	1.200
1975	6.000	1.250
1976	5.575	1.225
1977	5.225	1.175
1978	5.025	1.000
1979	5.000	1.075

2. Second Home Demand

The final element in housing demand, is the demand for second homes, primarily vacation units. Despite the high expectations for this sector of the market, because of increased leisure time and incomes, there is little evidence from the available data that this market is booming. The Annual Housing Survey indicates that between 1970 and 1977 there were 190,000 seasonal units built, slightly more than 25,000 per year. During the same period a similar number of seasonal units were removed from the stock.

For the 1980's it is possible that construction of vacation units will increase. However, their impact of incremental demand will be small relative to demographic and replacement demand.

D. Summary--Demand Forecasts for the 1980's

It is quite clear from our analysis that "effective housing demand" will be strong in the 1980's though the range of demand estimates is quite high. The changing age distribution and the overall growth of the population will assuming constant headship rates produce a demand for 12 million housing units. Depending on economic conditions, increases in household headship rates can be expected to produce an additional demand for 4 to 7 million housing units. In terms of "replacement demand" the

possible estimates also show a wide range. A low estimate of replacement demand (.2% per year) indicates 1.8 million units over the decade. A most likely estimate (.40%) indicates 3.6 million units over the decade. While a high estimate (.9%) would show a demand for 8.0 million housing units in the 1980's. The other components of demand will contribute at most 350-400,000 units over the decade.

Thus, as Table XVII shows the demand for housing units in the 1980's will range from nearly 14 million to over 27 million units. The most likely estimates based on our forecasts of economic conditions show an effective demand for 21 million units. This is somewhat lower than "conventional wisdom" estimates but still represents an enormous demand for shelter in the 1980's.

Table XVII

Summary of Housing Demand by Component in the 1980's

Demand Component	Economic Scenarios		
	Pessimistic	Base	Optimistic
Population Growth and Age Distribution Changes	12 million	12 million	12 million
Household Headship Rate Changes	-	5.5 million	7 million
Replacement Demand	1.8 million	3.6 million	8.0 million
Total Demand	13.8 million	21.1 million	27 million

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