

**DEPARTMENT OF HOUSING  
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# Analyzing Trends in The Housing Industry

August 1973



U.S. Department of Housing and Urban Development

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National Housing Policy Review  
Study

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ANALYZING TRENDS IN  
THE HOUSING INDUSTRY

U. S. DEPARTMENT OF  
HOUSING AND URBAN DEVELOPMENT

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# ANALYZING TRENDS IN THE HOUSING INDUSTRY

## U. S. DEPARTMENT OF

## HOUSING AND URBAN DEVELOPMENT

### INTRODUCTION

For the policy maker, the economist, the businessman, the environmentalist, and certainly for the American consumer, questions concerning housing production in the United States are increasingly complex to resolve, and ultimately lead to critical social and economic issues affecting the very fabric of American life.

Rather than attempting to address these questions, this chapter seeks to compile and report the facts, to analyze major trends, and thus, to form a solid basis for future governmental actions. The information presented is extensive, in many cases new, and collected from a wide variety of sources. For housing production in the nation as a whole - as well as for individual regions of the country - the chapter studies both existing patterns and emerging trends, or changes in the patterns.

The following paragraphs summarize briefly the results of these analyses. In addition, although the body of the chapter is primarily intended to be descriptive, we discuss several issues here which may be meaningful to policy makers in shaping the future of housing production.

### SUMMARY OF FINDINGS

Without question, the long-cherished American goal of owning a home in the traditional sense is fast becoming an elusive one. As described in Section 1, "Industry Growth Trends," the standard single-family house has lost substantial market share in the past 5 years to other less costly forms of housing, particularly low-rise multifamily structures and mobile homes - which offer the advantages of lower construction and maintenance costs and, in some cases, otherwise unaffordable amenities.\* In fact, studies show that over 50 percent of the nation's families cannot afford the luxury of single-family homeownership.

\* - A more detailed study of cost trends is presented in a separate chapter, "Analyzing Trends in Housing Construction and Operating Costs."

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On the other side of the picture are the myriad small companies which comprise the vast housing industry. As pointed out in Section 2, "Trends in Corporate Involvement," these companies operate in a highly volatile environment and are extremely sensitive to economic fluctuations and monetary conditions. Only a small fraction of one percent of the nation's 110,000 homebuilding companies can generate annual sales of over \$10 million, although this is slowly changing as the industry becomes increasingly concentrated.

What is the nature of the housing produced by these companies? Section 3, describing product trends in single-family housing, shows that the American consumer today is paying more for less: Purchase prices have risen 29 percent in the past 6 years, while the "value" of homes appears to have declined, particularly in terms of overall size.

In response to increasing cost pressures, the homebuilding industry has begun to take advantage of advances in production technology. However, as Section 4 describes, progress has been slow: stringent building codes and the scarcity of reliable testing techniques have restrained the development of dramatic advances.

#### RELEVANCE FOR POLICY MAKERS

In developing governmental regulations and monitoring fiscal matters, the nation's policy makers clearly have an immediate and lasting impact on the fabric of the country's housing. While the policies developed and the facts behind them are subject to intense debate from many quarters, several general observations appear to be sound:

1. Different financing methods would reduce instability in an industry where production capacity is directly tied to economic conditions.
2. New regulations would significantly foster and improve technological advances.
3. Public and private housing problems require separate approaches and solutions.
4. Fundamental changes in the industry overall may change future government policy.

Each of these viewpoints is discussed in more detail below, although the data that stimulated them are included elsewhere in the body of the chapter.

## New Financing Methods Would Stabilize Production

Few major American industries appear to be so dynamic - or unstable - as the housing industry. Building "booms" are rapidly followed by sharp declines in production and so-called housing shortages can occur within a short span of time. During these periods, observers question the industry's inherent production capacity, while demand goes unsatisfied. And yet, a close analysis of past production and monetary patterns shows that capacity is directly related to the nation's economic conditions and monetary supply - not to fact-based forecasts of supply and demand, or to government plans for future housing needs, or to production limitations inherent in the industry.

For example, between 1969 and 1972, the number of housing units produced increased by 50 percent, rising from about 1.5 million units in 1969 to about 2.4 million in 1972 - a cogent demonstration of the industry's latent capacity. Fundamentally, this capacity exists because the industry is fragmented among thousands of small, flexible, and poorly capitalized companies. When they are able to obtain construction loans and arrange permanent mortgages, they move into the market as builders. However, when funds are unavailable during periods of tight money, they do not have sufficient capital resources to continue to operate.

In fact, the homebuilding industry is so dependent on monetary conditions that, traditionally, it has been used as a powerful lever in managing the nation's economy to stimulate or slow down growth. While the views of policy makers differ on this subject, it appears that such sharp fluctuations in the industry will eventually run contrary to the nation's housing needs over the long term. In short, many observers believe that the industry should be given the same type of monetary considerations afforded to other key American industries.

What is needed, some believe, is to remove the current barriers to the flow of funds and to allow the creation of new financial institutions and lending policies. The recommendations of the Hunt Commission and the President's proposals now before Congress would go a long way toward building a more stable and planned growth in the industry.

## Technological Advances Should Be Encouraged

Aside from financing difficulties, the major problem faced by the industry is one of escalating costs in almost every major area - particularly land, financing, and construction costs, as well as the costs associated

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with stringent building and environmental regulations. To meet this problem, homebuilders and manufacturers have only a few alternatives: achieve more economic land use, implying higher density construction; employ inferior building materials and techniques to produce a smaller or less valuable product; or preferably, achieve economies of scale through more innovative production techniques.

In short, there is a compelling need to encourage technological advances in the areas of prefabrication of components, new materials, and more "industrialized" housing production. Along these lines, government could through regulation seek to:

- ¶ Develop alternative performance building codes on a national basis, perhaps tied to warranties, to allow builders to operate more cost effectively in a variety of markets
- ¶ Encourage the nationwide testing of materials and methods to speed the adoption of improved materials and techniques
- ¶ Provide syndication of results in order to speed their acceptance by publicizing testing results and encouraging the approval of regulatory bodies.

Further, it will be important to assure labor groups that these innovations will allow more stable and profitable conditions under which the industry can grow.

Public and Private  
Housing Problems  
Require Separate Solutions

Many lower and middle income households are now excluded from much of the conventional housing market, and private industry alone most likely will not be able to meet public housing needs in the future. Rather, major changes are needed in the fundamental economics of public housing, and the environment in which it is created.

Of course, the assumption here would be that the provision of housing to low-income people will be a government obligation. Further, the simple construction of housing cannot be expected to solve the key needs of the low-income population for jobs, environmental protection, education, and the like. Social and political changes are also required in order to allow low-income families to become effective consumers of new housing units, changes which only government can undertake.

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If private industry can make a contribution in this area, one major opportunity appears to be mobile homes. For many low-income and retirement families in suburban and rural areas, this alternative has been increasingly popular in recent years. In fact, substantial improvements have occurred in the quality of the homes produced, the attractiveness of the parks, and their links with the infrastructure of the communities around which they are built.

On the other hand, private industry can be expected to meet satisfactorily the housing needs of moderate and upper income households in the future - if care is taken to address the key problems faced by the industry. As the earlier paragraphs discussed, the production capacity is there, and with a stabilized flow of funds, sufficient units can be built.

### Radical Industry Changes Will Affect the Future

The homebuilding industry is experiencing basic changes within a short period of time. In formulating housing policies for the future, government should continue to analyze these changes closely, building a cohesive regulatory approach that ensures the long-term health of the industry.

The changes are both numerous and far-reaching. Public ownership has increased recently due to the expansion of well-capitalized companies through internal growth and acquisition. On the other hand, companies have had relatively limited success in institutionalizing their entrepreneurship. They have been able to increase sales, as has been demonstrated by the very significant track record of the hundred largest companies in the industry. However, in entering new geographic markets, they have been unable to capture any significant economies of scale beyond a relatively modest level so far; a reasonably good regional or large local builder often can build as cheaply, or more so, than one of the national companies. Moreover, and perhaps more important, the very large builders have been generally unable to develop a second generation of professional managers. Management development techniques and approaches are relatively primitive and the industry is plagued with a very high-level turnover among its key middle-level executives.

Further, the type of real estate and housing developments undertaken in the United States over the last 5 years is changing significantly in several ways. For example, density is increasing significantly in order to achieve more economic land use. The suburban frontier is virtually nonexistent in the eastern part of the United States; and the ability to maintain low land costs by simply moving a few miles further out from the city core is no longer possible in many areas.

As the cost of land has forced higher density, there have been significant changes in the type of housing product offered; townhouses, patio homes, and zero lot line applications are taking the place of the traditional single-family home. Another major change has been the emergence of much more targeted developments focusing on attracting subelements within the population, such as singles, young families, and families with mature children. This has meant a change in design of housing, with the units less generally adapted to the needs of a cross section of people, but specifically designed to meet the needs of the target group.

\* \* \*

In sum, this chapter focuses on analyzing the major changes taking place in the housing industry, particularly for the past 5 years. The import of many of these trends is clear, but extensive additional analyses could be carried out. For example, efforts might attempt to correlate product trends with social, economic, and demographic data in order to draw conclusions concerning the impact of housing trends on national living conditions.

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## 1 - INDUSTRY GROWTH TRENDS

Since the end of World War II, the growth of the housing industry has been highly cyclical, with strong shifts in the production of single and multifamily residential housing (including houses, apartments and mobile homes) occurring within very short time frames (Exhibit 1-1). And in the last 5 years, growth has continued to be sporadic: Climbing steadily during 1968 and 1969, total housing production began to level off in 1970 with the general economic downturn. In 1971, however, the industry recovered dramatically, with total housing starts reaching their highest level since 1950.

In 1972, housing starts and mobile home shipments were still growing, but not as rapidly as the preceding year: Total starts increased only 14 percent and mobile home shipments, 16 percent (Exhibit 1-2). Now, after 2 years of strong production rates, the industry's growth appears more restrained. In fact, first-quarter results for 1973 point to a leveling off, or even a decline, in the industry as a whole:

¶ Housing starts, by far the largest category, have declined about 4 percent: The number of units produced are estimated to be 488,200 for the first 3 months of 1973, compared to 510,200 for the same quarter of 1972. Seasonally adjusted annual rates are estimated at 2.259 million, or about 5 percent below 1972 start levels.

¶ Mobile home shipments have increased about 10.2 percent: The number of units shipped are estimated to be 140,650 for the first quarter of 1973, compared to 127,600 for the same quarter of 1972. Seasonally adjusted annual shipments are estimated at 650,000, representing an increase of 13 percent over 1972.

Early production figures for the second quarter of this year (covering April and May 1973) indicate a slight recovery over the first quarter, with single and multifamily housing starts up to 203,500 in April and 235,300 units in May and mobile home shipments at 61,560 units for April (Exhibit 1-3). Despite these most recent results, however, economists are still

projecting that housing production will experience a significant slowdown during the remainder of 1973 and the first half of 1974.

Based on an evaluation of past trends, the current rate of housing production is probably adequate to meet minimum levels of demand for new housing - provided that abandoned or substandard dwellings are not extensively replaced. Conversely, meeting the need to gradually upgrade deteriorated housing stock will probably require a substantial increase in production over the next several years - indicating to some observers that even the current rate of production will be seriously inadequate for future needs.

Thus, before adopting a point of view on production rates, it is important to analyze in more detail the dynamics of housing production - particularly, trends occurring in the major types of housing produced and trends in production for various regions of the country.

### CHANGES IN TYPES OF HOUSING

In the past 5 years alone, important changes in the fabric of the nation's residential housing have occurred. These shifts can be seen in each of the three major types of dwellings produced:

1. Single-family housing - dwellings comprising one to four units, including detached units and townhouses, that are either built or assembled on site and intended for less than two families
2. Multifamily housing - dwellings built on site with five or more units, including low-, medium-, or high-rise structures
3. Mobile homes - transportable structures for one family that exceed either 8 body feet in width or 32 body feet in length, are built on a chassis, and are used as dwellings with or without permanent foundations.\*

Of these three dwelling types, multifamily housing and mobile homes are now the fastest growing categories, increasing at a rate substantially above that of the three categories combined over the past 5 years (Exhibit 1-4). In the same period, single-family housing - traditionally the

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\* - Only a very small number of mobile homes are ever moved after the initial factory-to-site shipment. Mobile homes should be distinguished from motor homes and other recreational vehicles, which are not intended to be permanent residential housing.

dominant form of housing - has accounted for a smaller portion of total production, decreasing from approximately 60 to 45 percent of all production - despite substantial increases in the actual number of single-family starts (Exhibit 1-5). The following paragraphs discuss some of the factors underlying these changes.

#### Relative Decline in Single-Family Housing

While it is difficult to set priorities on the causes of the decline in single-family housing production, several factors are clearly responsible. Overall, the decline reflects economic pressures on two key points in the industry: escalating construction costs for the builder, coupled with increased costs and relatively declining disposable income for the potential buyer. To illustrate: With the median price for new, privately owned, one-family homes at an estimated \$27,000 in 1972, an annual income of about \$11,000 is required to cover ownership costs.\* This average annual income level, we estimate, excludes over 50 percent of all U.S. families from buying a median-priced home (Exhibit 1-6); purchase prices are discussed more fully in the section on product trends.

A major factor in these cost increases is the steadily rising cost of land, which forces builders to find more efficient uses of land, such as multifamily dwellings. Specifically, from 1967 to 1972, land costs have increased about 102 percent and structure costs (labor, bricks and mortar) about 34 percent. For a detailed discussion of cost changes over the last 5 years, see Analyzing Trends in Housing Construction and Operating Costs.\*\*

The trend away from single-family homes has also been stimulated by changes in the nature of the U.S. population. The two age groups that tend to opt for multifamily and mobile homes have grown rapidly in the decade commencing in 1960; in particular, the 20- to 29-age group increased by 41.3 percent and the over 55 group increased 18.5 percent in this period. In the decade between 1970 and 1980, these groups are projected to grow substantially again - i. e., 30.0 percent for the 20-29 group and 15.8 percent for the over 55 group - which will probably support further growth in multifamily housing and mobile homes.

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\* - Qualifying income is calculated using the Federal Housing Administration rule of thumb that 2-1/2 times income should equal the house price.

\*\* - U.S. Department of Housing and Urban Development, August 1973.

Set against this trend, however, there may be a strengthening of the age group that traditionally buys single-family units - the 30-39-age group - which is generally characterized by higher incomes and larger families; this group is expected to increase by 40 percent from 1970 to 1980. It remains to be seen whether this group, now accustomed to other than single-family dwellings but traditionally the predominant purchasers of single-family homes, will opt more for single-family or choose other forms of housing.

### Growing Importance of Multifamily Housing

As a percentage of total housing starts (all types combined), multifamily starts have grown from 25 percent in 1967 to 32 percent in the first quarter of 1973. And within the traditional homebuilding market (single and multifamily combined), the growth of multifamily housing has been even more marked, increasing from 29 percent to over 40 percent over the same period (Exhibit 1-7). Much of this increase can be explained by the lower per-unit cost achieved through economies of scale, with total production and land costs distributed over a larger number of units.

But the cost advantage is not the only explanation behind the growing proportion of multifamily dwellings. Builders have created an important new product in the multifamily market - i. e., low-rise garden apartment complexes. As shown in Exhibits 1-8 to 1-10, 1- to 3-floor apartments are the dominant factor in the market, while the traditional high-rise building constitutes only 1 percent of all multifamily structures built.

Low-rise garden apartments are often well-landscaped subdivisions catering to particular customer groups, such as elderly, young singles, and new families. They have the appeal of lower cost, less maintenance; and, perhaps most important, they can offer otherwise unaffordable amenities such as swimming pools, recreation centers and tennis courts. The benefits of these amenities appear to increasingly outweigh the traditional value of "privacy" provided by detached single-family homes.

Another important factor supporting the trend toward multifamily housing has been the increase in the condominium form of ownership, which permits a customer to purchase an apartment unit under much the same terms as a single-family home. Most simply, condominiums permit the multifamily apartment resident to enjoy the services of multifamily living and the tax advantages of homeownership.

## Increasing Popularity Of Mobile Homes

As discussed earlier, mobile homes are now an important type of housing. By far the least expensive form of shelter to purchase, the cost of a mobile home averages \$6,500 for a fully furnished unit, compared to over \$27,000 for an unfurnished one-family site-built unit. In addition to the advantage of dramatically lower prices, mobile homes are being designed to more closely resemble conventional housing. Thus, instead of sparsely furnished, polished aluminum tubular "trailers," the mobile homes of today have a rectangular shape (often with a peaked roof), are sheathed in siding resembling wood and are sold with furniture available in a variety of styles.

In conjunction with the trend toward more "homelike" mobile homes, their size has been steadily increasing over the years. In the 1930s and 1940s, mobile homes were typically 8 feet by 30 feet. The 1950s saw the advent of the 10 x 50 foot model, which was the predominant size until the introduction of the 12 x 60 foot model in the 1960s. The newly developed 14 x 70 foot model and "double-wides" (usually two 12 x 60s joined on site) are already increasing in sales and are expected to be the most popular model in the 1970s. The total square footage of a double-wide is about 1,400 square feet, approximately equal to the median square footage for all new privately owned one-family homes in 1971.\*

For these reasons, mobile homes have made a considerable dent in the single-family market (comprising both single-family homes and mobile homes). Over the past 5 years (1967-1972), the mobile home share of this market grew to 28.9 percent (an 8.4 percent increase), and by the first quarter of 1973, the mobile home share jumped to 32.8 percent (Exhibit 1-11). When viewed over a 10-year period, and taking the total housing market (including multifamily units), the growth in mobile homes is even more dramatic. In 1962, mobile homes accounted for only 7 percent of the total housing market; by 1967, the mobile home figure had increased to 15 percent, and by the first quarter of 1973, it was fully 22 percent of the market.

Taking the lower priced segments of single-family housing as a further measure, the impact of mobile homes has been even more extreme. In the under \$15,000 market, mobile homes are dominant, having grown from

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\* - See U.S. Department of Housing and Urban Development, Analyzing Trends in Housing Construction and Operating Costs, August 1973.

82 percent of all homes sold at or below this price in 1967 to over 97 percent in 1972. And in the under \$20,000 market, as Exhibit 1-12 shows, mobile homes now comprise 81.5 percent of the market. Further, this growth has occurred despite a sharp decline in the number of lower priced one-family units produced during this period. Specifically, the traditional single-family house selling for less than \$20,000 constituted nearly 40 percent of total one-family sales in 1967 (houses and mobile homes combined), but their share had dropped dramatically to 20 percent by 1972 (Exhibit 1-13).

### Growth in Townhouses

The increasing dominance of mobile homes in the lower priced, detached single-family housing market may be similar to another major trend occurring in the industry - that is, a dramatic increase in the volume of townhouses and four-plexes. As mobile homes have been squeezing out on-site construction of the lowest priced detached units, the moderate-priced single-family market appears to have turned toward comparatively low-cost townhouses in order to remain price competitive to some degree. The reasons for this growth appear straightforward: Townhouses permit builders to achieve many of the same economies of scale afforded by multi-family construction and maintenance, while still providing similar financial and psychological benefits provided by single-family housing.

Production data for the top 500 homebuilders, who make up over 30 percent of the industry's sales, show that the output of townhouses and four-plexes has increased dramatically since 1968. While townhouses only accounted for 3.0 percent of total starts made by these homebuilders in 1968, they constituted 27.0 percent in 1972 - a growth of market share of 24.0 percent in 4 years (Exhibit 1-14).

### TRENDS IN REGIONAL CONCENTRATION

In general, the growth of housing production within each of the nation's four major regions defined by the Bureau of the Census (i. e., West, South, Northeast, and North Central) has followed the same type of cyclical pattern as the industry overall. From region to region, however, growth trends vary widely, in large part caused by great differences in population growth and the density of existing housing stock. As Exhibit 1-15 illustrates, trends in growth and share-of-market for each region during a 5-year period (1967-1972) are as follows.

1. West. Volume in the West increased at a 19.8 percent compound annual rate, growing from 263,000 units to 647,000 units. Compared to the other three regions and the industry overall, the West has experienced the most rapid rate of growth and is now the second largest housing producing region in the country.
2. South. The growth of housing production in the South has also been strong - nearly 17 percent compounded annually - growing from 640,000 units to 1,368,000 units, or 46 percent of total national output. Thus, while growing at a slower rate than the West, this region has remained the largest producer of new residential housing over the last 5 years.
3. Northeast. Growing at an approximate 8 percent annual compound rate, the Northeast region increased its volume from 250,000 to 377,000 units. Overall, this region has experienced the lowest volume of new housing in the past 5 years.
4. North Central. Annual growth in the North Central region was only 6.5 percent, a rate less than half as rapid as the total industry. Volume for 1972 reached 562,000, putting the North Central next to last in terms of annual output. Although the North Central region was second only to the South in unit volume in 1967, it has seen markedly weak growth in the past 5 years.

Unlike volume trends, the types of dwellings actually produced have tended to follow the same patterns within each region that were apparent on a nationwide basis. Thus, in all regions, single-family housing continues to constitute the largest share of the housing market. Similarly, this segment is consistently losing ground to the more rapidly growing multifamily and mobile home markets. However, there is one noteworthy exception to this general pattern. Despite the fact that mobile homes have been growing at a faster rate in the aggregate, multifamily production has increased more rapidly than mobile home shipments in all regions except one: Only in the North Central region have mobile home shipments grown more rapidly than multifamily housing. (Exhibits 1-16 to 1-21 display production data by region and product type for the 1967-1972 period.)

\* \* \*

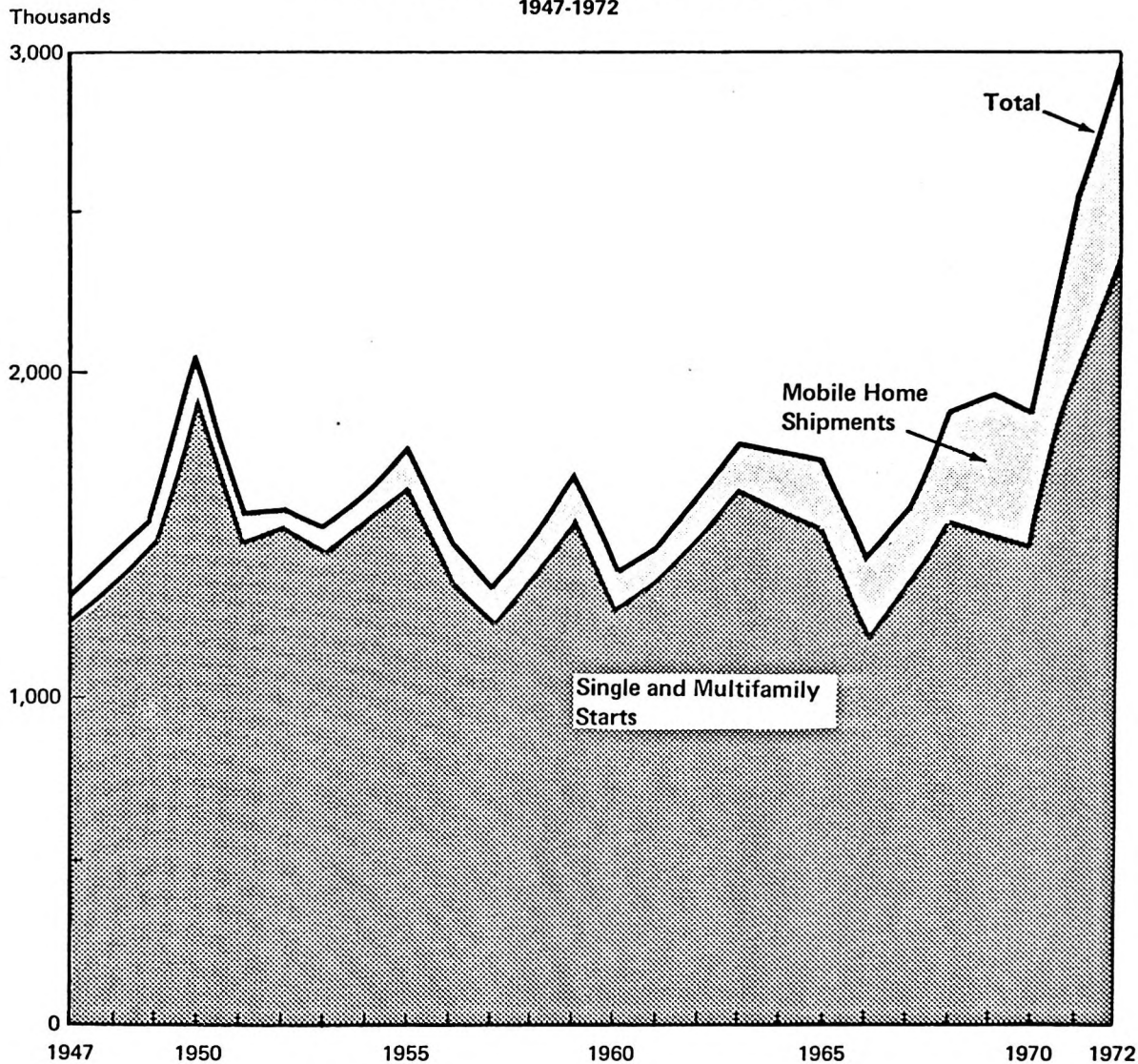
In summary, an analysis of U.S. housing production patterns highlights the growing importance of multifamily housing and mobile homes - trends that demonstrate a significant shift in consumer demand and industry

production. Although single-family housing still has the largest market share in all regional markets, the shift to multifamily housing and mobile homes is greatest in the South and West, the two fastest growing markets.



FOR OVER TWO DECADES, HOUSING PRODUCTION HAS BEEN HIGHLY CYCLICAL . . . .

TOTAL HOUSING UNITS STARTED AND SHIPPED  
1947-1972

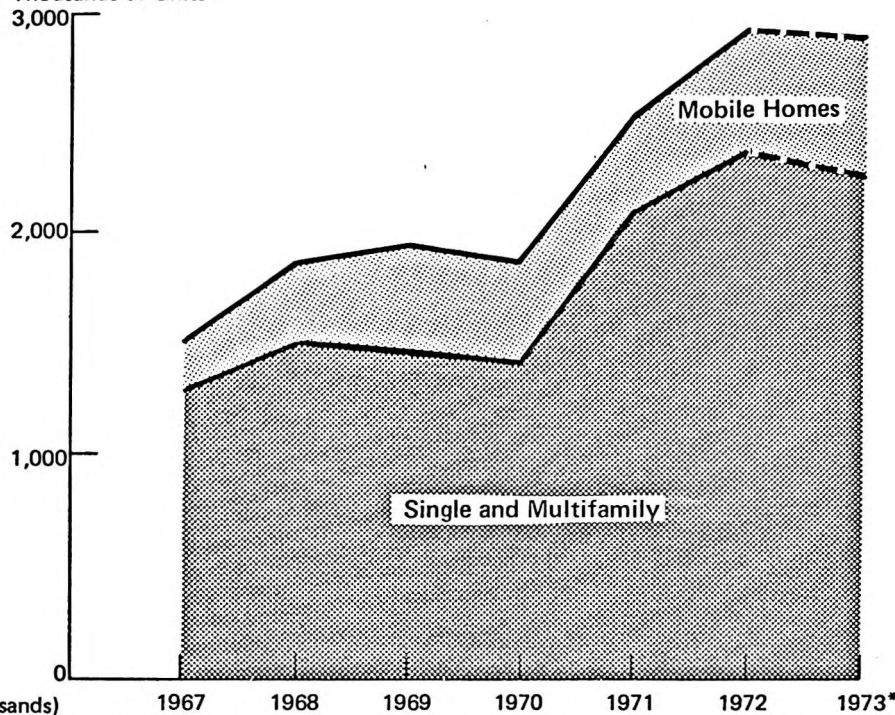


COMPOUND ANNUAL GROWTH RATES		
YEARS	MOBILE HOMES	SINGLE AND MULTIFAMILY
1947-1972	7.8%	2.6%
1961-1972	18.3%	5.2%
1967-1972	19.1%	12.4%

Sources: U.S. Department of Commerce, Bureau of the Census, *Housing Starts, C20-73-3*; Mobile Homes Manufacturers Association.

**AFTER TWO STRONG YEARS OF GROWTH, HOUSING PRODUCTION MAY BE LEVELING OFF . . . .**

Total Housing Starts  
(or Shipments) in  
Thousands of Units

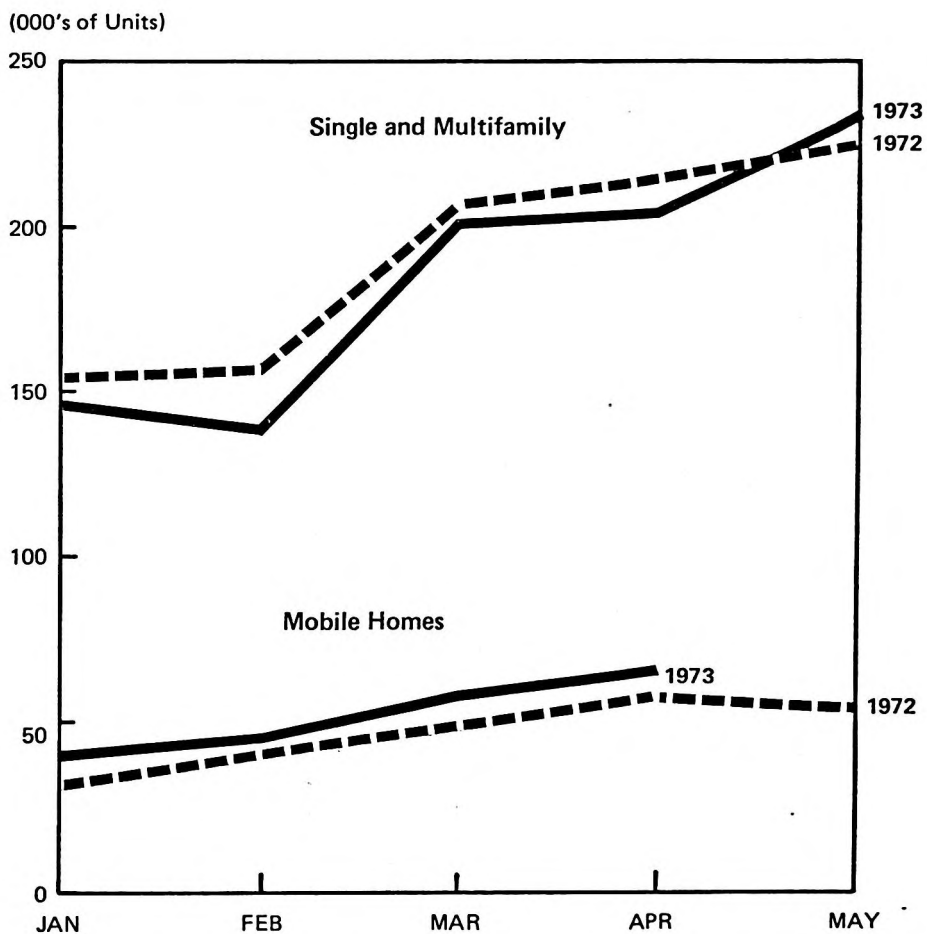


	1967	1968	1969	1970	1971	1972	1973*
Single Family	929.7	995.6	909.4	910.9	1,286.1	1,461.4	1,360.0
Multifamily	392.2	549.7	590.1	558.0	798.5	917.0	899.0
Total Conventional Housing	1,321.9	1,545.3	1,499.5	1,468.9	2,084.6	2,378.4	2,259.0
Mobile Homes	240.4	318.0	412.7	401.2	496.6	575.9	650.0
Total all Units	1,562.3	1,863.4	1,912.2	1,870.2	2,581.1	2,954.3	2,909.0

\*Preliminary estimate.

Source: U.S. Department of Commerce, Bureau of the Census, Housing Starts, C20-73-3.

## EARLY 1973 PRODUCTION LEVELS CLOSELY PARALLEL 1972 . . . .



## SINGLE AND MULTIFAMILY STARTS - FIRST 5 MONTHS

1972	150,900	153,600	205,800	213,200	227,900
1973	147,300	139,500	201,200	203,500	235,300

## MOBILE HOME SHIPMENTS

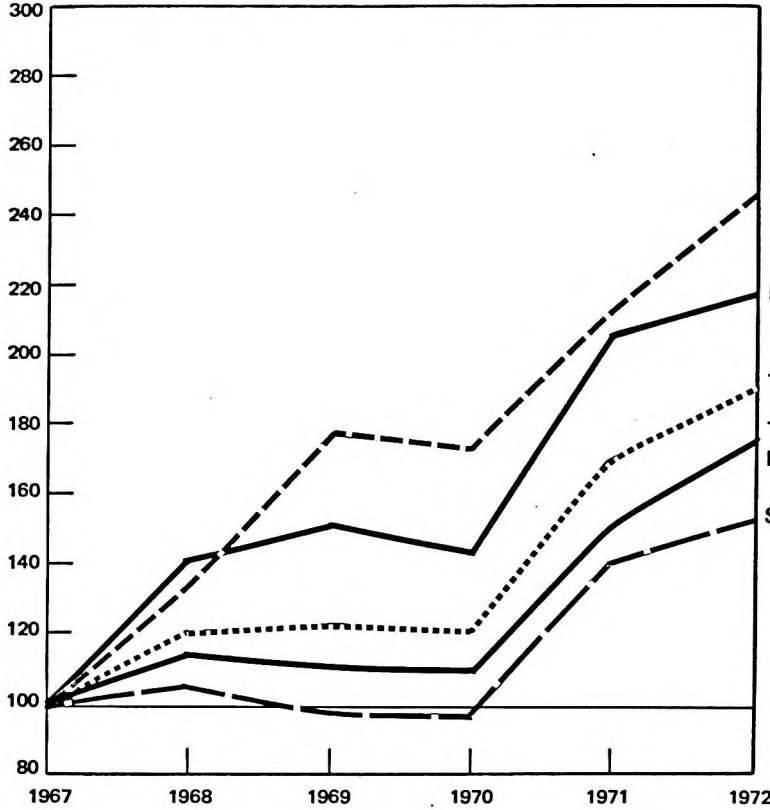
1972	33,500	40,000	49,100	53,700	51,800
1973	40,700	42,910	57,040	61,560	NA

Sources: U.S. Department of Commerce, Construction Reports, C20-73-3; U.S. Department of Housing and Urban Development.

MULTIFAMILY AND MOBILE HOMES HAVE INCREASED AT A RATE SUBSTANTIALLY ABOVE THAT OF THE INDUSTRY OVERALL . . . .

INDEX OF HOUSING STARTS  
BY TYPE OF DWELLING

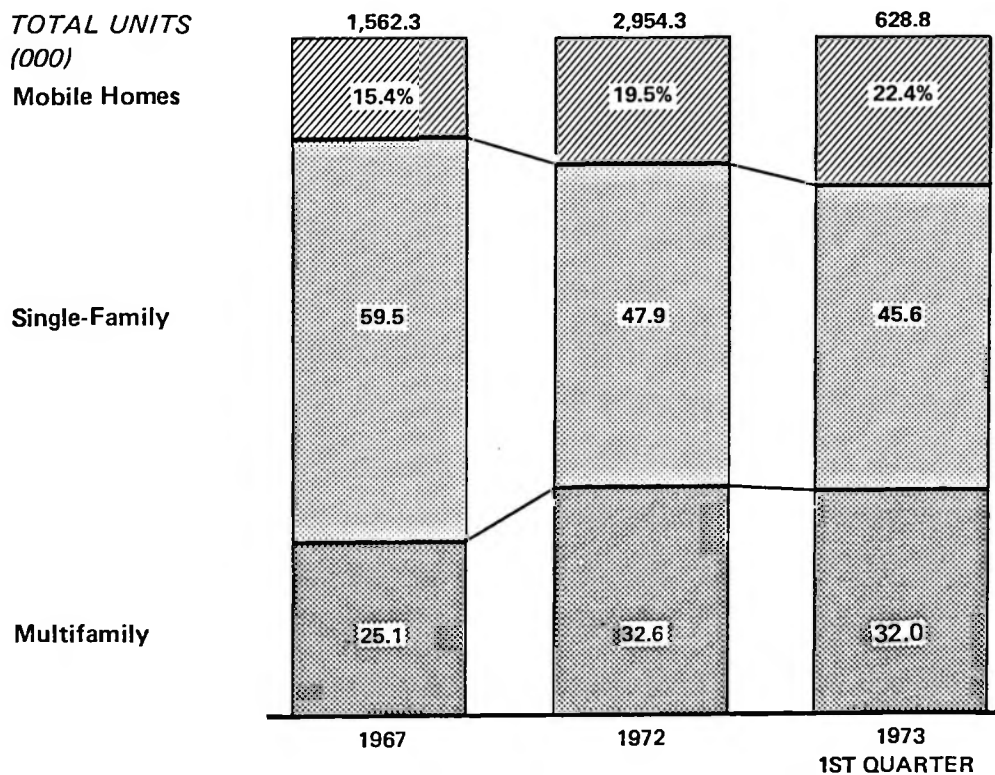
Index  
1967 = 100



5-YEAR  
ANNUAL  
COMPOUND  
GROWTH RATE  
1967-1972

Mobile Homes	19.1%
Multifamily	18.9
Total (all types)	13.6
Total conventional housing	12.4
Single-Family	8.8

**BOTH MOBILE HOMES AND MULTIFAMILY HOUSING HAVE TAKEN MARKET SHARE FROM SINGLE-FAMILY HOUSING . . . .**



Source: U.S. Department of Commerce, Bureau of the Census, Housing Starts, C-20-73-3.

THE ESCALATING COST OF HOUSING IS ESTIMATED TO HAVE EFFECTIVELY PRICED OUT OVER 50 PERCENT OF ALL FAMILIES . . . .

YEAR	MEDIAN NEW ONE-FAMILY SALES PRICE <sup>1</sup>	SIZE OF AVERAGE HOME SOLD (SQ. FT.) <sup>2</sup>	MEDIAN U.S. FAMILY INCOME <sup>3</sup>	QUALIFYING INCOME <sup>4</sup>	PERCENT FAMILIES NOT ELIGIBLE
1963	\$18,000	-	\$5,490	\$ 7,200	56.7%
1964	18,900	-	5,696	7,560	66.0
1965	20,000	-	6,032	8,000	66.8
1966	21,400	1,525	6,507	8,560	65.1
1967	22,700	1,570	6,889	9,080	65.7
1968	24,700	1,605	7,434	9,880	66.4
1969	25,600	1,585	8,017	10,240	63.4
1970	23,400	1,400	8,335	9,360	56.1
1971	25,200	1,415	8,583	10,080	57.8
1972	27,600	NA	NA	11,000	NA

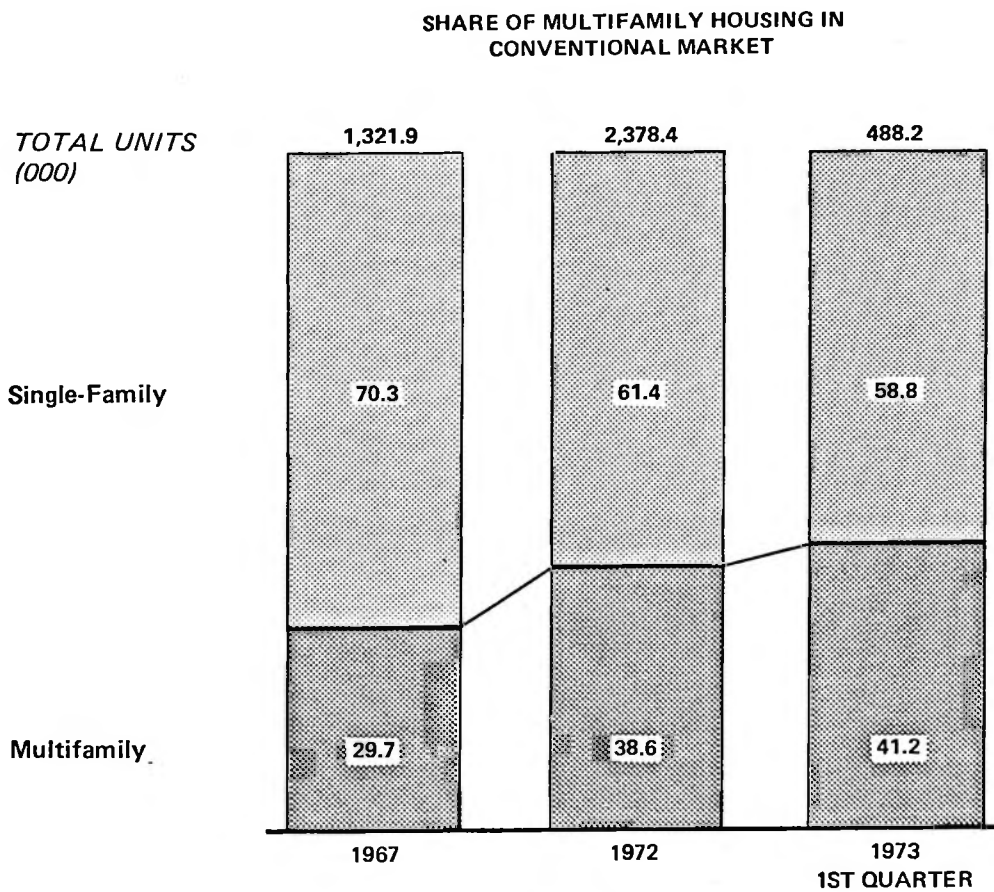
1 - U.S. Department of Commerce, Bureau of the Census, Construction Reports: New One-Family Homes Sold and For Sale, C25-73-3.

2 - U.S. Department of Commerce, Bureau of the Census, Construction Reports: Characteristics of New One-Family Homes: 1971, C25-71-13.

3 - U.S. Department of Commerce, Bureau of the Census, Current Population Reports: Consumer Income, P60, No. 85, December 1972.

4 - Qualifying income calculated using the 2½ times rule employed by FHA.

IN TERMS OF THE CONVENTIONAL HOUSING MARKET, THE GROWTH OF MULTIFAMILY HOUSING HAS BEEN SIGNIFICANT . . . .



Source: U.S. Department of Commerce, Bureau of the Census, Housing Starts, C20-73-3.

LOW-RISE APARTMENT BUILDINGS CONTINUE TO DOMINATE PRIVATE  
MULTIFAMILY CONSTRUCTION . . . .

NUMBER OF FLOORS  
PRIVATELY OWNED APARTMENT BUILDINGS STARTED

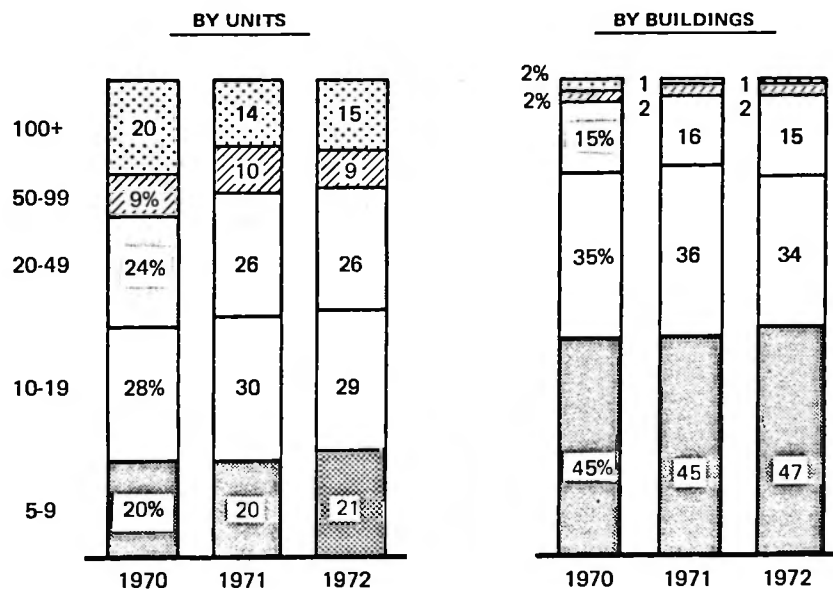
<u>BUILDINGS</u>			<u>UNITS</u>	
4 or more floors	1 - 3 floors		1 - 3 floors	4 or more floors
4	96%	1970	81%	19
3	97	1971	83	17
4	96	1972	80	20

Source: U.S. Bureau of the Census, *Construction Reports, Housing Starts, April 1973.*



**SMALL- AND MEDIUM-SIZED APARTMENT BUILDINGS CONTINUE TO ACCOUNT FOR THE MAJORITY OF UNITS AND BUILDINGS . . . .**

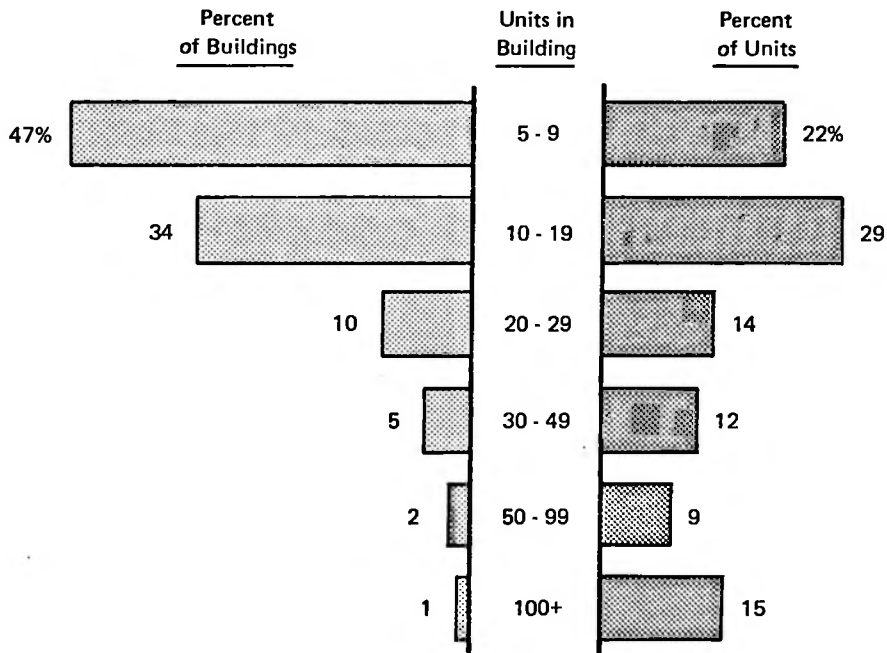
**PRIVATELY OWNED APARTMENT BUILDINGS STARTED  
PERCENT DISTRIBUTION**



Source: U.S. Bureau of the Census, Construction Reports, *Housing Starts*, April 1973.

ALTHOUGH LARGE APARTMENT BUILDINGS ACCOUNT FOR A SIGNIFICANT NUMBER OF UNITS, THEY MAKE UP A SMALL PORTION OF TOTAL BUILDINGS . . .

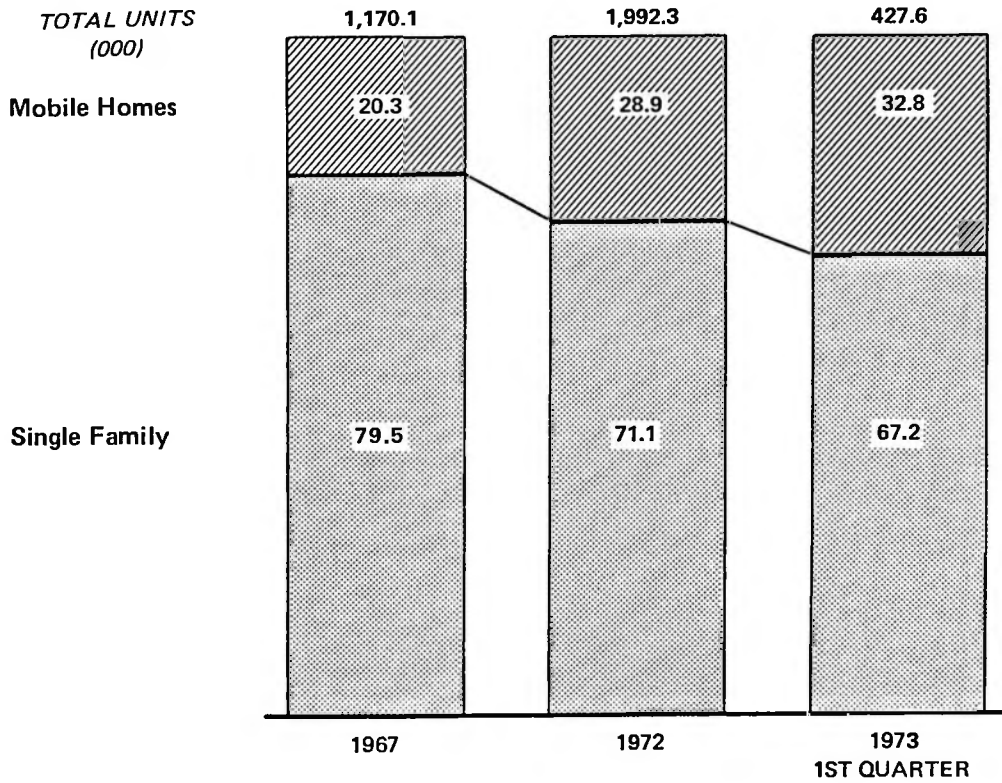
PERCENT DISTRIBUTION  
NUMBER OF UNITS  
PRIVATELY OWNED APARTMENT BUILDINGS STARTED  
(1972)



Source: U.S. Bureau of the Census, *Construction Reports, Housing Starts*, April 1973.

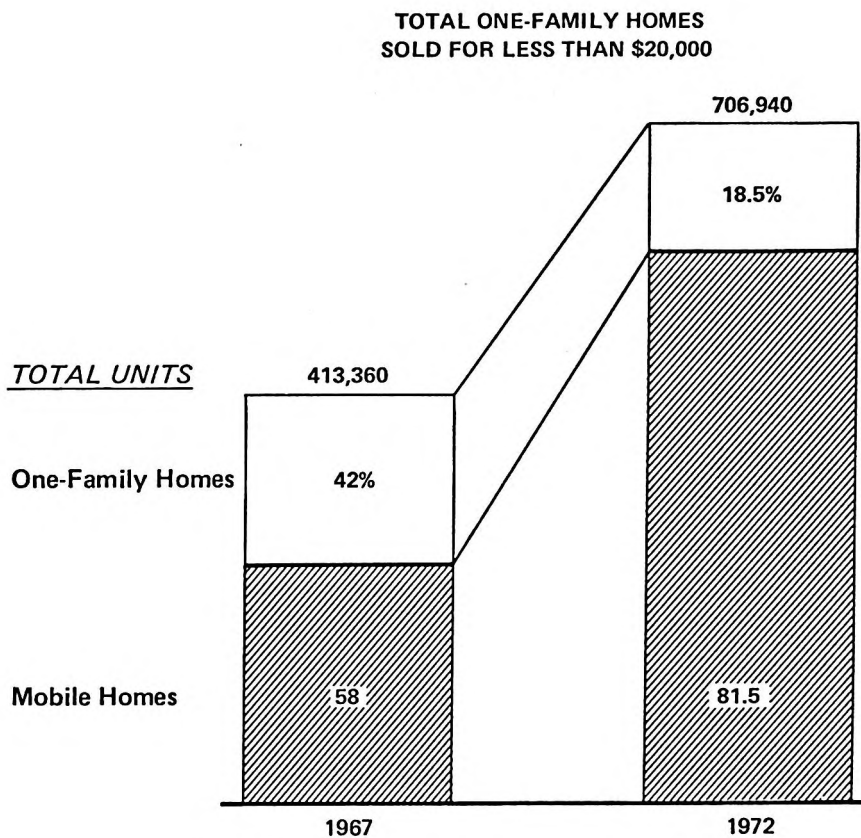
MOBILE HOMES HAVE MADE A CONSIDERABLE DENT IN THE COMBINED SINGLE-FAMILY/MOBILE HOMES MARKET . . . .

RELATIVE SHARES OF COMBINED  
MOBILE HOMES/SINGLE FAMILY MARKET



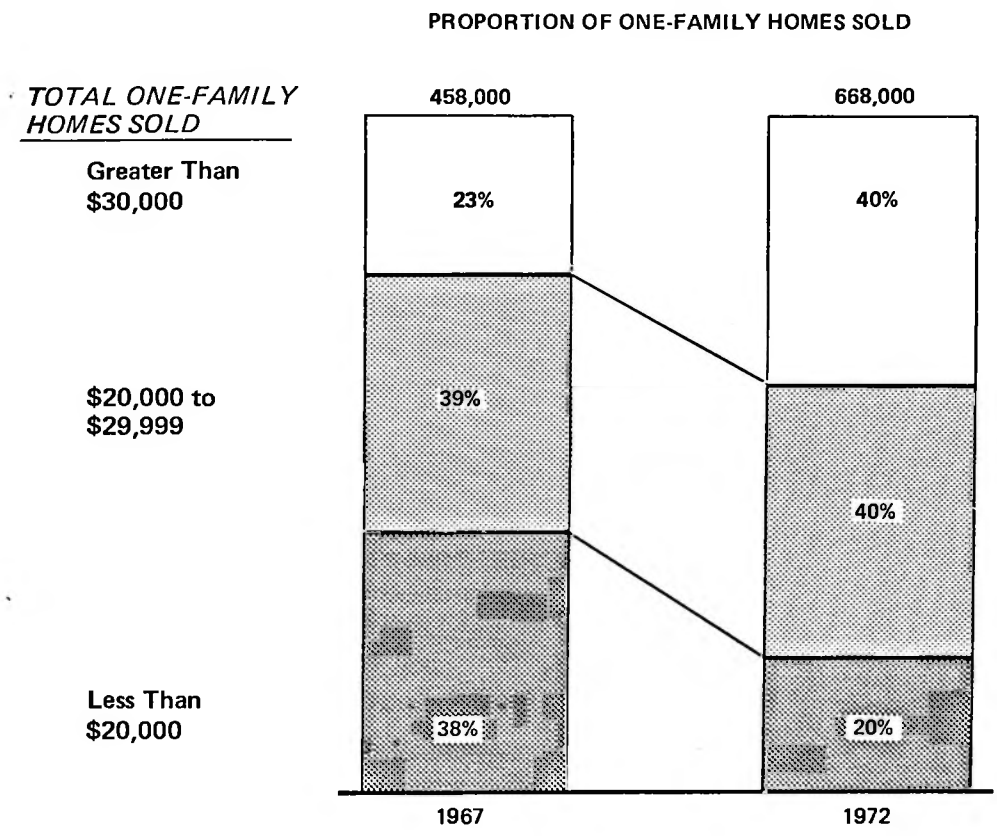
Source: U.S. Department of Commerce Bureau of the Census, *Housing Starts, C20-73-3*; Mobile Homes Manufacturers Association.

MOBILE HOMES NOW DOMINATE THE UNDER \$20,000 HOME MARKET . . . .



Sources: U.S. Department of Commerce, Bureau of the Census, *Construction Reports*, C25-72-12, May 1973; Mobile Homes Manufacturers Association.

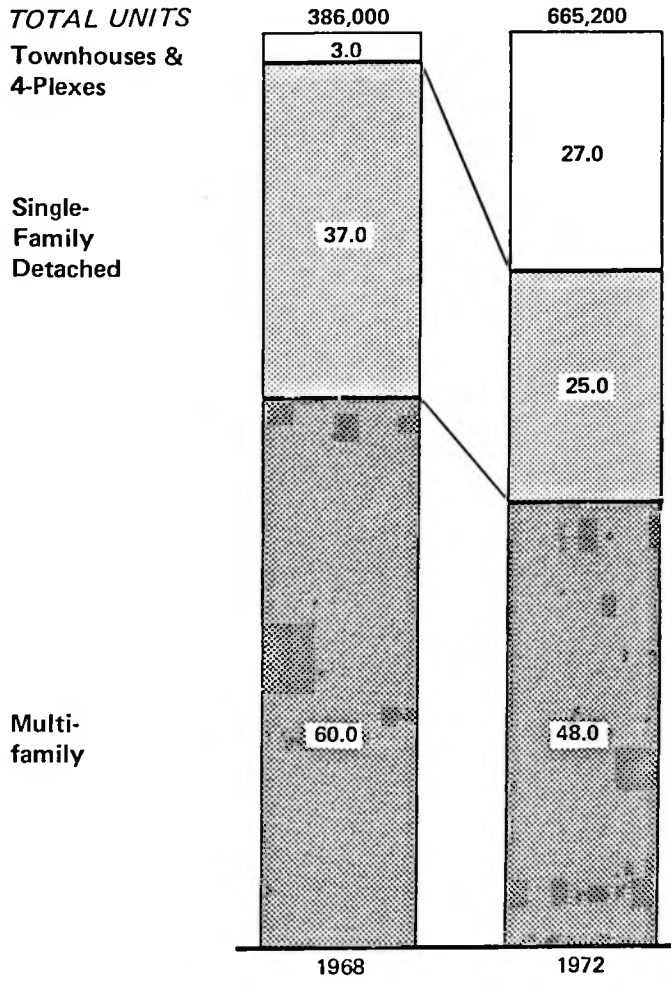
THE PROPORTION OF LOWER PRICED ONE-FAMILY HOMES HAS DECLINED . . . .



Source: U.S. Department of Commerce, Bureau of the Census, *Construction Reports*, C25-72-12, May 1973.

TOWNHOUSE PRODUCTION HAS GROWN RAPIDLY IN RECENT YEARS . . . .

MAJOR HOMEBUILDER PRODUCTION  
BY TYPE OF HOUSING UNIT\*  
1968-1972

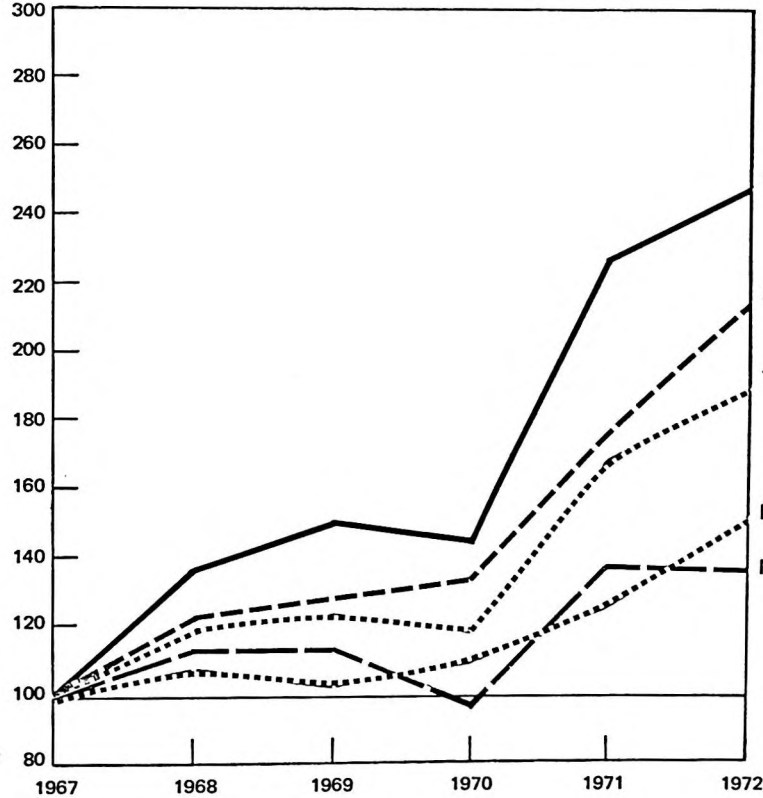


\*Homebuilders that produce over 200 units per year.  
Source: 1973 Blue Book of Major Builders.

THE WEST AND THE SOUTH ARE THE FASTEST GROWING REGIONS IN HOUSING STARTS AND SHIPMENTS . . . .

GROWTH IN TOTAL HOUSING PRODUCTION BY REGION  
1967-1972

Index  
1967 = 100  
300

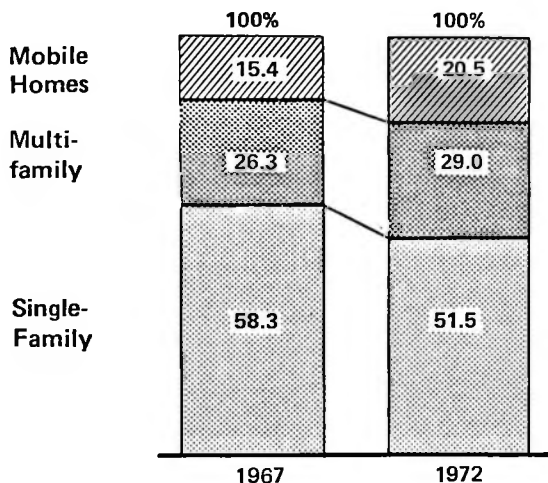


	SHARE OF MARKET		5-YEAR COM-POUND ANNUAL GROWTH RATES
	1967	1972	
West	16.8%	21.9%	19.8%
South	41.0	46.3	16.4
Total U.S.	-	-	13.6
Northeast	16.0	12.8	8.6
North Central	26.2	19.0	6.5

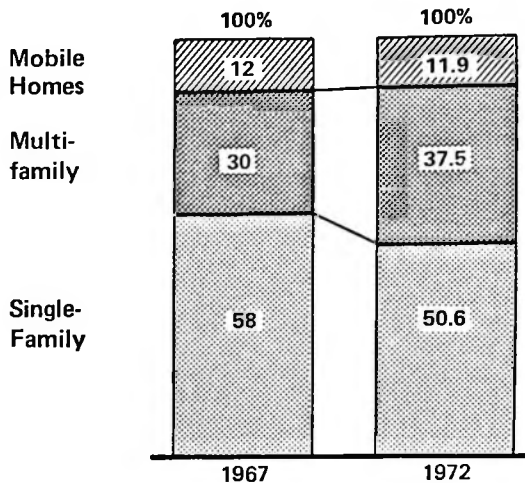
Sources: Department of Housing and Urban Development and Mobile Homes Manufacturers Association.

**SINGLE-FAMILY HOUSING AS A SHARE OF TOTAL PRODUCTION HAS DECLINED MOST SIGNIFICANTLY IN THE SOUTH . . .**

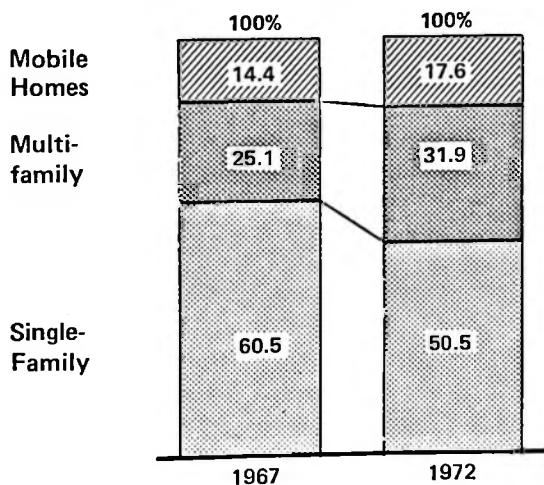
**NORTH CENTRAL**



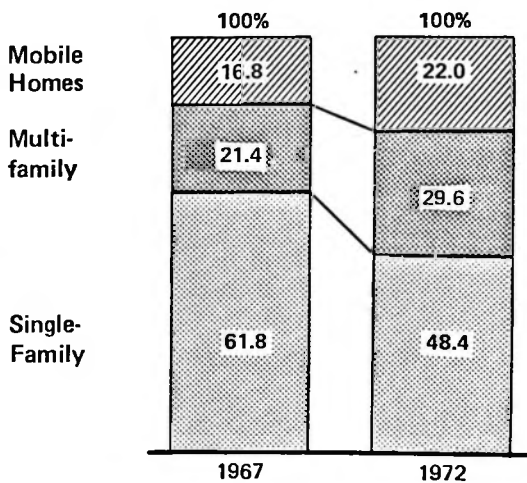
**NORTHEAST**



**WEST**



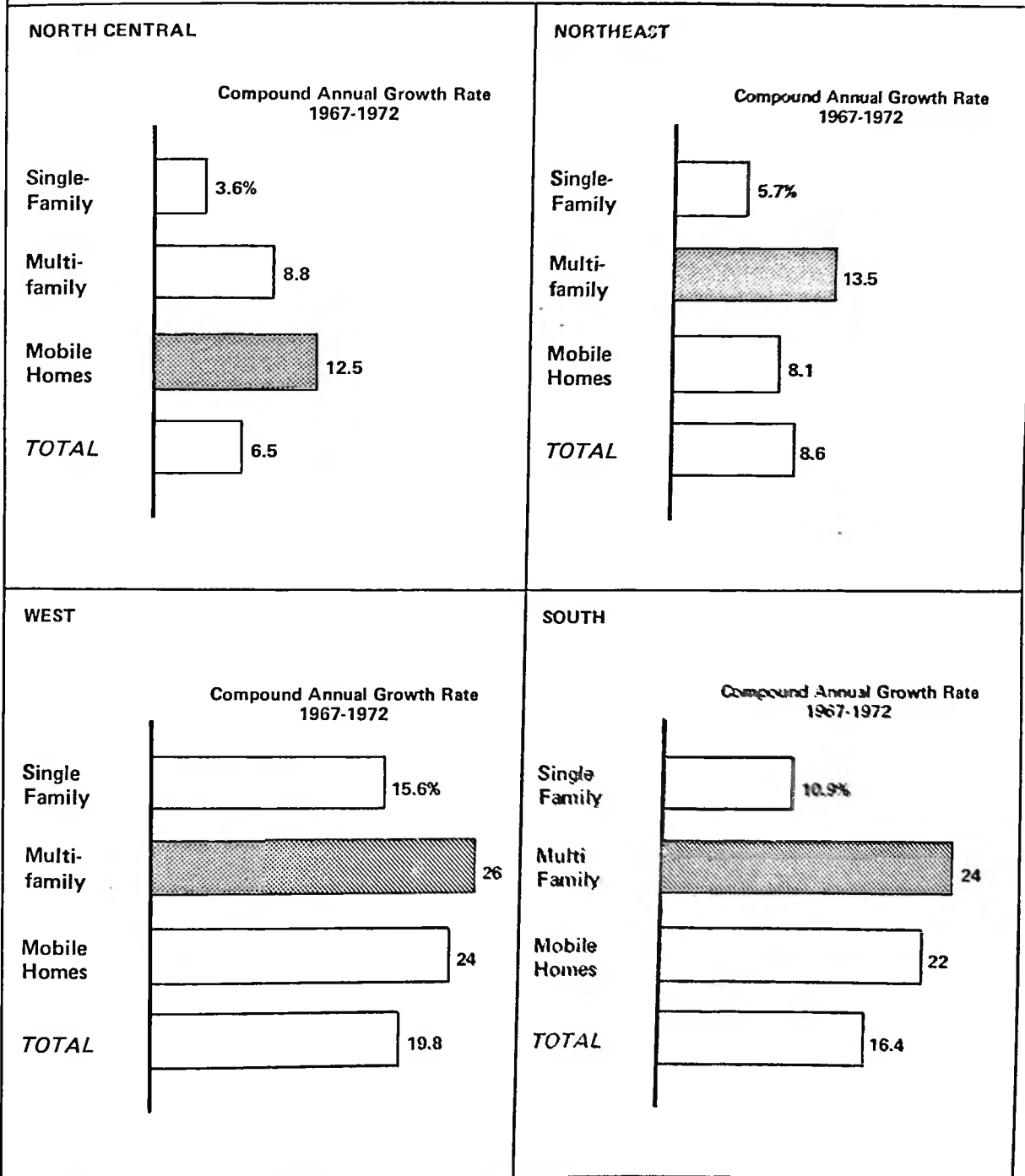
**SOUTH**



Sources: U.S. Department of Housing and Urban Development; Mobile Homes Manufacturers Association.

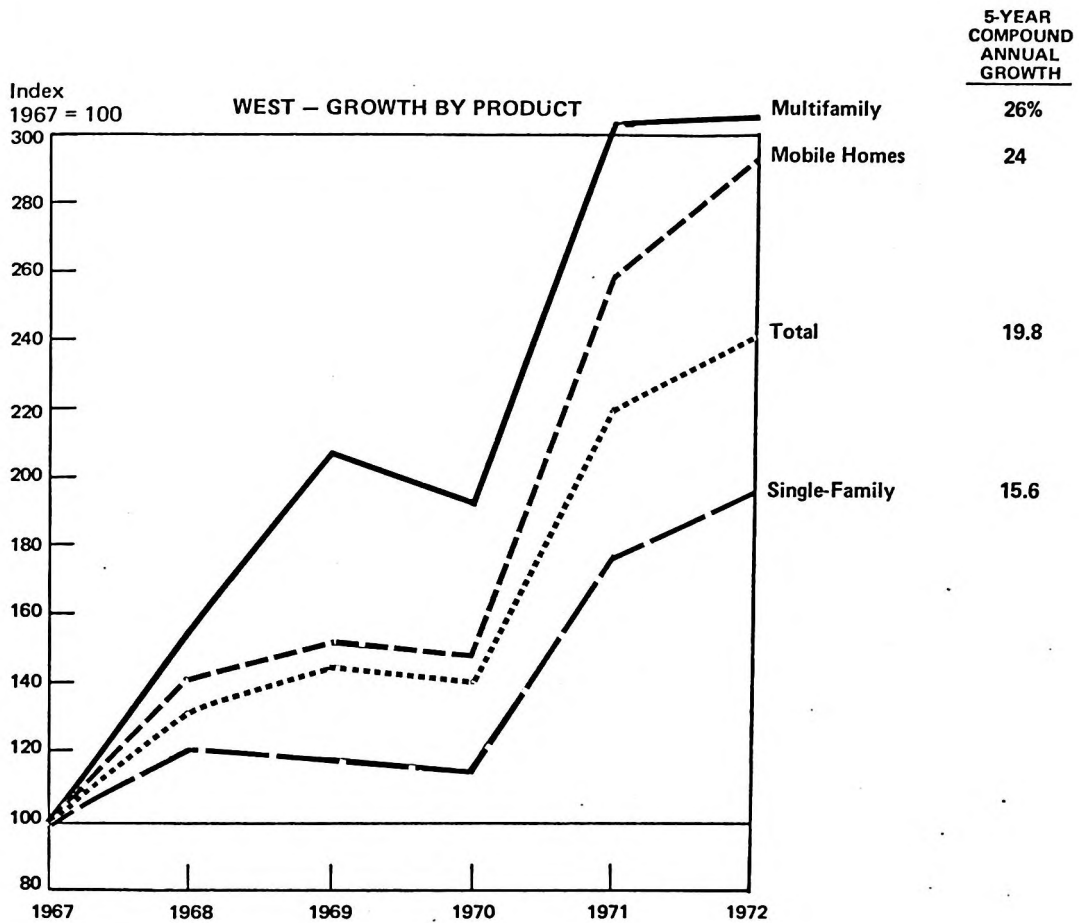


MULTIFAMILY HOUSING HAS GROWN THE MOST RAPIDLY IN ALL REGIONS EXCEPT NORTH CENTRAL . . . .



Source: McKinsey & Co., Inc., calculations.

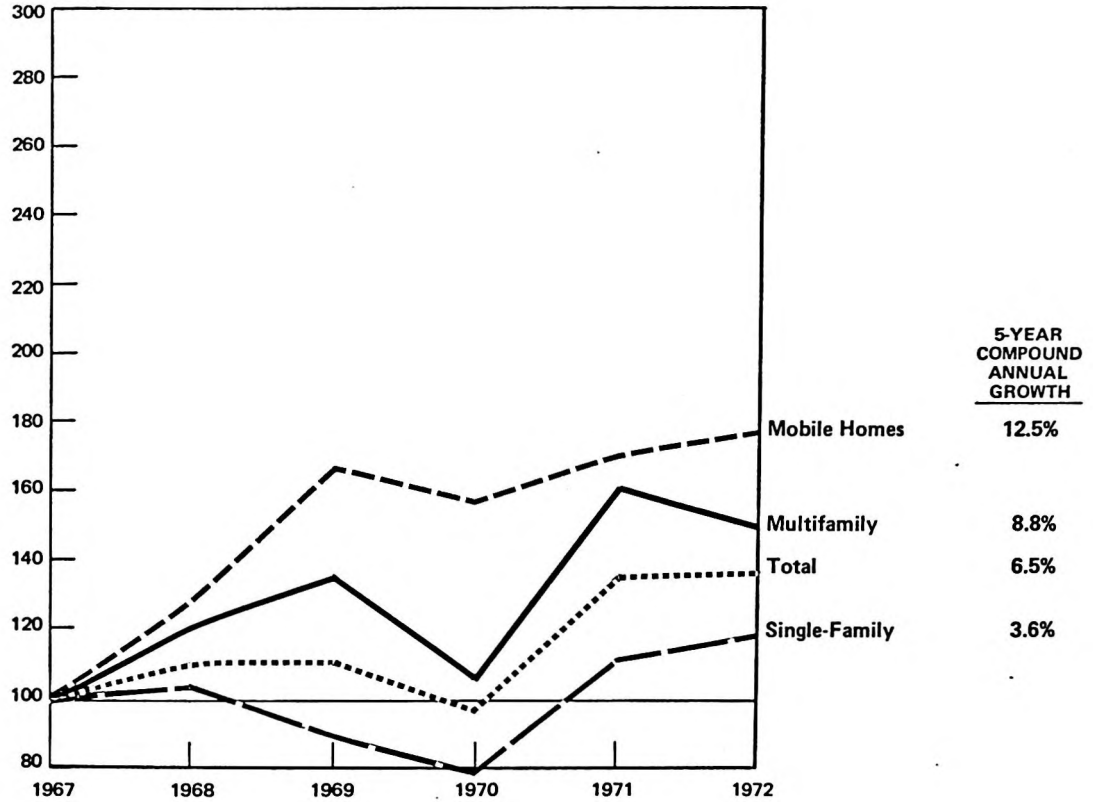
IN THE WEST, BOTH MULTIFAMILY HOUSING AND MOBILE HOMES HAVE GROWN RAPIDLY . . . .



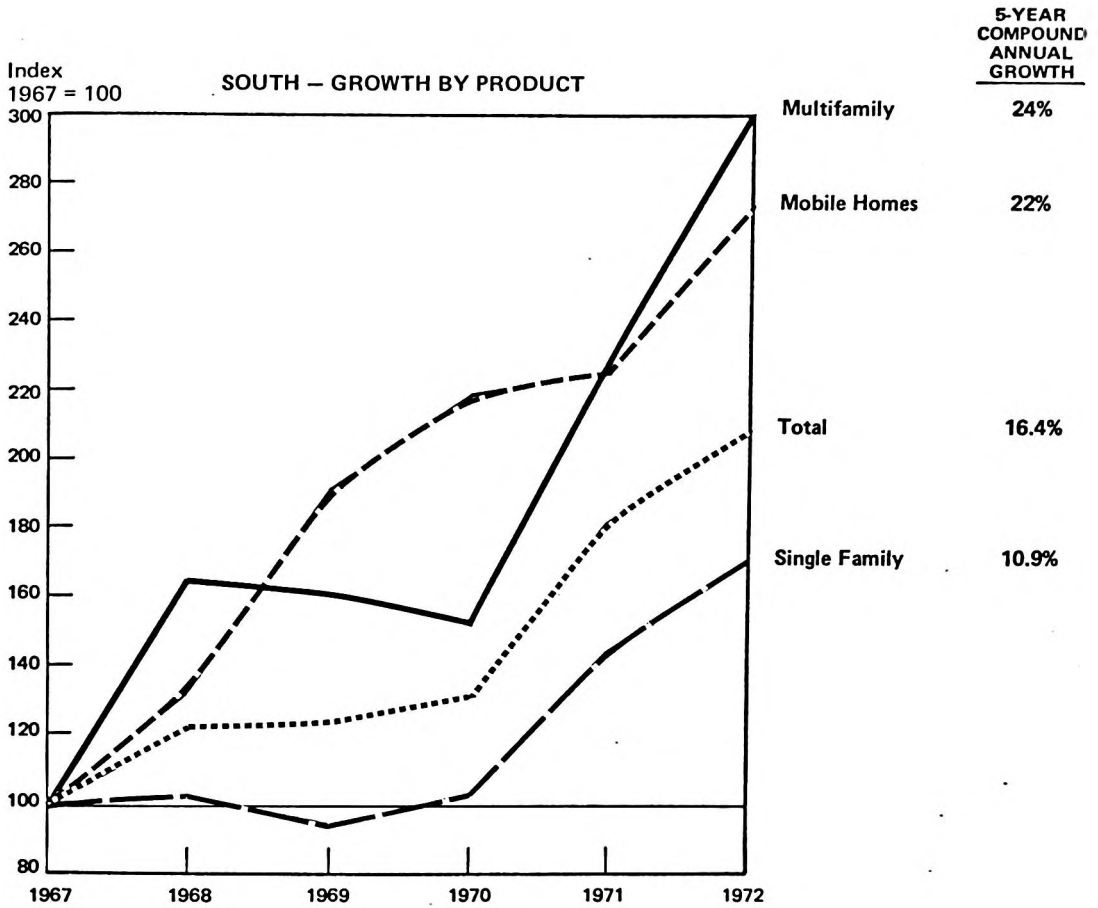
**MOBILE HOMES HAVE BEEN THE PACESETTER IN THE NORTH CENTRAL REGION . . . .**

Index  
1967 = 100

**NORTH CENTRAL — GROWTH BY PRODUCT**



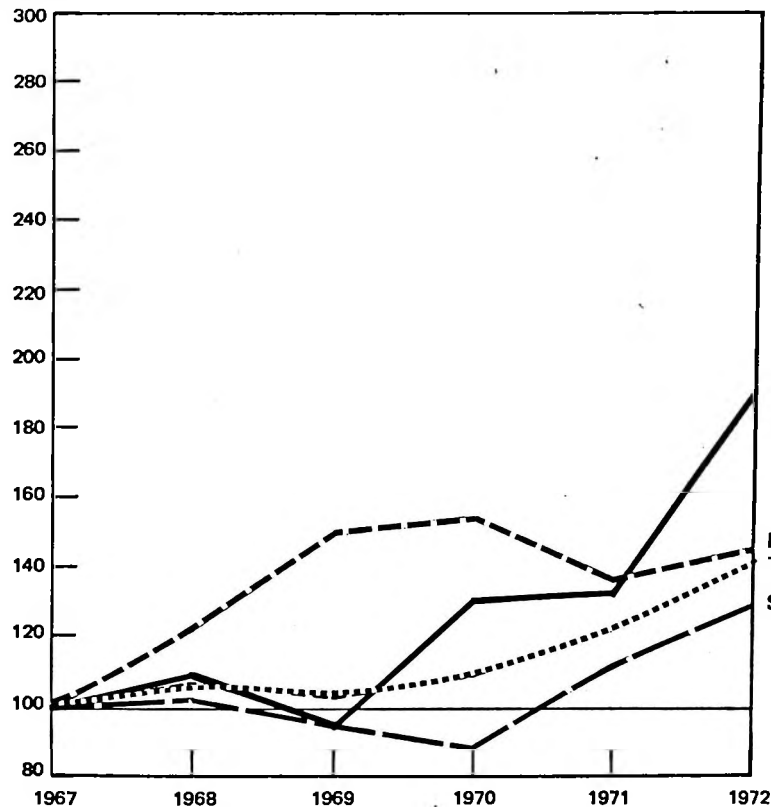
ALTHOUGH MULTIFAMILY HOUSING HAS GROWN MORE RAPIDLY IN THE SOUTH, MOBILE HOMES HAVE GROWN MORE STEADILY . . . .



SINCE 1969, MULTIFAMILY HOUSING HAS GROWN QUITE RAPIDLY IN THE NORTHEAST . . . .

Index  
1967 = 100

NORTHEAST - GROWTH BY PRODUCT



5-YEAR  
COMPOUND  
ANNUAL  
GROWTH

Multifamily	13.5%
Mobile Homes Total	8.1
Single-Family	8.6
	5.7

## 2 - TRENDS IN CORPORATE INVOLVEMENT

All of the country's residential housing is produced by companies in two business areas: homebuilders, who build on-site single and multi-family homes; and mobile home manufacturers, who account for the remainder of housing units. To generalize about the companies operating in these two sectors is difficult, since they have little in common except a need to safeguard earnings growth and protect themselves from cyclical profit squeezes, mainly by forming larger companies and seeking economies of scale through more sophisticated fabrication techniques.

As the following paragraphs show, the differences between the two groups are far more obvious. For example, the traditional homebuilding industry is extremely fragmented, comprised of over 110,000 companies - the vast majority of which produce less than 25 units annually. In fact, only a very small fraction of these companies generate annual sales of over \$10 million, making them marginal enterprises compared to the nation's typical industrial, retailing, or service companies. By contrast, the relatively young mobile home industry is made up of less than 400 companies, and is fairly well concentrated within a small number of firms at the top of the industry, a few of which are among the country's more substantial corporations.

Also, unlike the assembly line manufacture of mobile homes, conventional homebuilding generally continues to be a series of "terminal" projects - that is, only when the last houses of one project are built and sold is a new project began. As a consequence, the barriers to entering the homebuilding field are very low - considerably less formidable than in mobile home manufacturing, which requires the investment of long-term capital. This relative ease of entry may, in part, explain why the country has come to depend so heavily on a multitude of small-scale and often short-lived homebuilding firms to help meet the demand for new housing.

Deciding whether or not this situation is desirable for one of the nation's more critical industries ultimately involves a subjective point of view regarding industry growth. However, one point is difficult to dispute: the fortunes of homebuilders (and even mobile home manufacturers) now

are dependent not so much on traditional economic laws of supply and demand, but rather on fluctuations in the nation's economy and the supply of money. In a country whose population is increasing steadily, it can be assumed that demand will increase accordingly. And yet, environmental conditions in the homebuilding industry do not encourage the stability of the companies involved in the industry, or of the supply of the nation's housing from year to year.

## THE HOMEBUILDING SECTOR

Much has been said and written about almost every aspect of homebuilding; conventional wisdom and popular myths surround the monolithic entity known as the homebuilding "industry" - which produced over \$45 billion worth of new residential construction in 1972 alone. But remarkably little is really known about most of the companies operating in one of the largest sectors of the nation's economy. Nevertheless, important facts are becoming clear.

Perhaps the most unique characteristic is the fragmented and mercurial nature of the industry which, unlike most other major American industries, is composed of thousands of small firms that are usually short lived. Specifically, although figures vary, it is estimated that roughly 110,000 homebuilding firms were in operation in 1967, including approximately 87,000 general building contractors and 23,000 operative builders.\* Of these firms, the vast majority are small: Only a fraction of 1 percent today produce over 1,000 units annually,\*\* and only about 400 of the total had annual sales of over \$10 million in 1972.\*\*\* Quite the contrary, about 99 percent of all homebuilders produce less than 100 units a year.

And yet, these are the homebuilders - the 99 percent - about which data are often unreliable or unavailable. Thus, the discussion included in the remainder of this section is divided by size of homebuilder, first describing the operating characteristics of the vast majority of homebuilders (the small

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\* - General contractors construct single and multifamily housing for sale to others, while operative builders construct housing for their own accounts.

\*\* - Bluebook of Major Homebuilders.

\*\*\* - Professional Builder.

companies), and then describing the minority of larger firms for which more complete data are available - including their operating characteristics, market share, and financial performance.

### Operating Characteristics Of Small Homebuilders

As mentioned earlier, the dominant force in the market is the homebuilder producing less than 100 units, and more likely, less than 25 units a year. This type of firm is entrepreneurial and flexible in nature, tends to concentrate on single rather than multifamily housing, subcontracts much of its work, and typically does business as a sole proprietorship.

¶ Entrepreneurial and flexible business. The backbone of the homebuilding industry is the individual craftsmen, real estate operators and other small entrepreneurs, many of which may enter the homebuilding business during periods of plentiful money and, in turn, lie dormant during periods of tight money. In 1967 over one-half of these small firms did not have a payroll. Further, many companies tend to "switch businesses" according to perceived market demands and/or the supply of money. They will also often engage simultaneously in the related businesses of merchant building, custom building, rehabilitation and remodeling, land development, and commercial and industrial construction. This flexibility has enabled many to survive financially when the residential housing market declines, thereby giving them the resilience to reenter the market when conditions improve.

¶ Emphasis on single-family dwellings.\* Homebuilders with unit production of less than 100 units - i. e., the majority of homebuilders - are more likely to build single-family custom homes or engage in merchant building of single-family homes, than to build multifamily homes, as the following table illustrates.

---

\* - Trends in the single-family housing market are discussed later in more detail in the third major section of this chapter.



Primary Product Operation	Total 1969 Survey	Builders Surveyed*		
		Small (1-25 Units)	Medium (26-100 Units)	Large (101+ Units)
Merchant single-family	20.4%	19.8%	33.0%	34.7%
Custom single-family	19.0	28.8	13.8	4.2
Multifamily	9.3	4.8	13.5	31.7

\* - Source: 1969 Survey, National Association of Homebuilders (NAHB).

- ¶ High incidence of subcontracting. Because of the cyclical and seasonal nature of the homebuilding industry, subcontracting is a common occurrence. According to the 1969 NAHB survey, nearly 90 percent of the homebuilders surveyed subcontract at least 25 percent of their construction costs (Exhibit 2-1).
- ¶ Large number of sole proprietorships. According to the same 1969 NAHB survey, about 45 percent of all homebuilders are organized as corporations, 37 percent as sole proprietorships, with the remainder being partnerships or a combination of other forms. Compared to 5 years earlier, sole proprietorships have been on the increase, largely at the expense of the corporate form of organization (Exhibit 2-2). Sole proprietorships are particularly prevalent among single-family builders and producers of 1 to 25 units - builders who are most likely to remain a short time in the industry and, therefore, most likely to opt for a simple and inexpensive mode of entry. Conversely, among the larger firms (producing 101 or more units annually), the corporate form of organization is most common, reflecting the need for greater financial resources and limited liability (Exhibit 2-3).

In sum, most of the nation's homebuilders evidence every characteristic of an industry that is highly cyclical, greatly dependent on national monetary conditions and interest rates, and thus subject to extremely unpredictable market supply and demand factors.

## Operating Characteristics Of Larger Homebuilders

Compared to the small firms, major homebuilders - quite clearly the exception rather than the rule among homebuilding companies - appear to be stable, well capitalized organizations. Nevertheless, even among the 500 firms that produced more than 200 units in 1972, the operating characteristics of these homebuilders are typical of the nation's more volatile industries: Most of these firms tend to be local in nature, are managed almost exclusively by one or two chief executives, opt for the multifamily end of the business, and are frequently privately held corporations. Only among the very largest of these few major homebuilders do the companies operate in a wide geographic area, use a more typical "corporate" management structure, and adopt a public form of ownership.

To identify these characteristics, a recent study conducted for the Department of Housing and Urban Development examined the 511 large homebuilders identified by the Bluebook of Major Homebuilders in three groups: (1) the top 25 homebuilders in unit volume - Group I; (2) a sample of homebuilders falling between 26 and 200 on the Bluebook's list - Group II\*; and (3) a sample of homebuilders whose volume places them between 200 and 500 on the list - Group III.\*

1. Geographic span of operations. The majority of major builders (i. e., the smaller companies in Group III) operate in one state only, while Group II firms typically operate in one to three states, and Group I firms in an average of about nine states (Exhibit 2 - 4). Further, in terms of regions of the country, only the nation's largest 25 homebuilding companies are multiregional. While six of these builders are known to operate on a nationwide basis, the average number of regions served is between two and three. However, it should be noted that all regions of the country have experienced growth in the number of major homebuilders located in these markets (Exhibit 2-5). Although operating data are not available on the smallest builders discussed earlier (i. e., those with annual volume of less than 200 units), one could conclude that the vast majority only operate in one city or county. Thus, given that the smallest homebuilders represent more than 99 percent of all industry participants, the homebuilding industry appears to be primarily a "local" business.

2. Ownership. For the greatest number of major builders (Group III), only 20 percent are publicly held. In Group II, 24 percent are public, and

---

\* - Sample of 25 homebuilders.

56 percent of the nation's largest homebuilders are public (Exhibit 2-6). Clearly, the larger a homebuilding company grows, the more likely it is to move to a public form of ownership.

3. Management and organization. Among the 500 major homebuilders, four distinct types of internal organizations are typically employed:

- ¶ "One-man" management. Most of the smaller homebuilders (and thus most homebuilders), such as the Group III and smaller entities, employ a highly centralized form of management in which their chief executives (and close associates or members of their families) make all the operating decisions. In such cases, the small central staff spends much of its time at the site of a project and part-time specialists are employed on a project basis for accounting, financial management, design and engineering, and legal matters.
- ¶ Centralized management. Typical of the moderate-sized homebuilders (the small Group II and larger Group III firms) is a highly centralized structure which has a few "management processes" more typical of a corporation to support the organization's key decision maker - usually the founding entrepreneur. This form of management places a very lean project management team of executives in the field at each project and centralizes all staff work at headquarters, so that top management can easily review major operating decisions.
- ¶ Coalition. Some large homebuilders (some Group I and many of the larger Group II enterprises) employ a "coalition" type form of organizational structure. This semicentralized form of organization essentially is similar to a grouping of small- to medium-sized regional companies, each with a small central staff devoted primarily to financial management.
- ¶ Decentralized management. Typically, the large homebuilders (Group I firms and some Group II firms) adopt a regionalized organizational structure and delegate a large share of responsibility to the field. The field organization is supported with an operating staff at the regional level for finance, marketing, engineering, and construction. Headquarters executives review major decisions in terms of performance against plan, and are supported by a specialized budgeting and planning staff.

Overall, the bulk of homebuilding enterprises begin as one-man entrepreneurial operations and often remain the same as they grow. Even the

largest operations are today heavily dependent upon the personal style and leadership of one man or are a confederation of one-man entities. However, when a chief executive becomes responsible to public shareholders, the situation changes considerably and management problems often arise. For one, the financial rewards formerly available as the result of profitable "deals" in the smaller companies are frequently replaced by more standard salary, bonus, and fringe benefit packages in the public companies. A further complication occurs when public nonhomebuilding organizations acquire a homebuilder. In such cases, the freewheeling chief executive is compelled to adopt corporate procedures that may not be appropriate to housing production. As a result, executive turnover among publicly held companies has been high. For example, of 14 recently acquired homebuilders, only four of the acquired chief executives are still with their companies.\*

4. Nature of homes built, including the type of product and the method of construction. In terms of product lines, there appear to be no dramatic differences among the three groups of homebuilders. Unlike the majority of small builders discussed earlier, the major builders (Groups I, II and III) produce more multifamily units than single-family, with the major share of their volume being derived from low-rise apartments (Exhibit 2-7). While the product mix of Group II builders has not changed significantly from 1969 to 1972, the largest 25 builders (Group I firms) have been moving out of single-family production into townhouses and high rises. Similarly, the Group III firms have been diversifying into townhouses.

In terms of method of construction, the larger the homebuilding firm, the more likely it is to use prefabricated parts in the construction process (Exhibit 2-8). Of the top 25 builders, 52 percent of their units and 60 percent of the firms report using fabricated parts and components. In many cases, these parts and components are manufactured in the company's own factories and then assembled on site. Many executives of Group I firms anticipate a growing reliance on such methods of operation.

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\* - A survey of the nation's largest homebuilders that was recently conducted by the management consulting firm, McKinsey & Company, Inc., reported that the upper third of those homebuilders experiencing turnover realized an average annual loss of 35 percent of their middle managers. Another recent McKinsey study of the activities of insurance companies in real estate development reports that 80 percent of those with major real estate development operations experienced "high turnover" among top, middle, and project managers.

In sum, of the 500 largest homebuilders in the country (producing more than 200 units), most of these firms still evidence characteristics of smaller, more unstable organizations.

5. Share of market. Observing large homebuilding firms from another point of view, the 1973 Bluebook of Major Homebuilders reports that the 511 builders with annual volume of more than 200 units have captured an increasing share of the market over the last few years.

And as Exhibit 2-9 shows, the unit volume of these large builders represented 17.2 percent of total housing production in 1969, and by the end of 1972, this share had increased to 28 percent. Moreover, about three-quarters of this 1972 share is attributable to 225 firms, which generated a volume of more than 1,000 units annually. Similarly, Professional Builder reports, in terms of dollar volume, the value of housing constructed or manufactured by the largest homebuilders ("housing giants") has increased steadily as shown below.

Dollar Volume of "Housing Giants"\*  
(Housing Revenues)

<u>Year</u>	<u>Volume</u> (Millions of Dollars)
1968	\$ 2,670
1969	5,356
1970	6,833
1971	9,132
1972	10,711

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\* - Source: Professional Builder magazine, which defines "giants" as those homebuilders with sales greater than \$10 million annually.

Here, an unusual market phenomenon should be pointed out. Although major homebuilders continue to capture a growing share of the total units produced, their share of the industry's total dollar volume has not demonstrated a steady increase (Exhibit 2-10). Rather, in times of total industry decline, the major homebuilders maintain or increase their dollar volume, and in periods of increased housing production, major homebuilders are unable to increase their share of industry revenues accordingly.

In part, this phenomenon can be explained by the fact that the major homebuilders, as a result of their forecasts of market demand, tend to build less expensive housing (which accounts for the lower dollar volume) than smaller builders. Thus, in periods of economic prosperity when many small builders rapidly enter the market, the dollar volume generated by these smaller builders is relatively high. Conversely, in less favorable periods, some of these small builders produce nothing at all, while the better capitalized firms can continue production at a reasonable, though perhaps curtailed, rate.

6. Concentration and merger activity. Beyond increases in production, the growth in large homebuilding firms is also attributable to an extraordinarily high level of merger and acquisition activity, at least on the part of the publicly held homebuilders whose activities are recorded. Further, industry observers believe that this trend is also occurring among most of the largest homebuilders, whether or not they are publicly held.

Between 1969 and 1972, 31 publicly held homebuilders with annual revenues exceeding \$25 million engaged in a total of 84 mergers or acquisitions. This level of merger activity is extremely high compared to other industries. Among the top 200 manufacturing and mining firms, for example, the average number of mergers/acquisitions per company was 0.17 per year during the same period. By contrast, the average for the 31 publicly held homebuilders was 0.68 per year - about four times as many. Although this comparison must not be stretched due to the obvious differences between construction and manufacturing, it does provide some insight into the current activity in the industry.

Major homebuilders have been merging with and acquiring other firms for essentially three purposes: obtaining new product lines, the most common reason; expansion of existing product lines into new geographic markets; and forward or backward expansion into related business areas. The first of these, diversifying product lines, accounted for 43 percent of the mergers or acquisitions made by the publicly held homebuilders. In response to the high cost of single-family housing, for example, a homebuilder in this market might acquire firms with the capability to construct garden apartments, mobile homes, or townhouses. This motivation is particularly strong among publicly held firms that must satisfy stockholder needs for steady income streams, profits and growth.

Geographic expansion is another important reason for merger and acquisition activity, representing about 32 percent of the mergers or acquisitions identified. Geographic expansion provides the benefit of shielding the builder

from the possibility of serious market fluctuations in a single area. In seeking this expansion, a homebuilder merges with an existing operation, rather than starting a new business in a new locale, in order to avoid the painstaking orientation to new building codes, to rapidly build a solid reputation and a good relationship with local governments, or to better understand local market preferences, suppliers, sources of labor, and subcontractor capabilities.

Backward and/or forward integration has accounted for 25 percent of the mergers and acquisitions identified. Such integration generally has taken the form of combinations with building supply organizations, housing fabricators, land development enterprises, and financial institutions.

Despite this high level of merger/acquisition activity, economic concentration of homebuilding is still relatively low, with the largest homebuilding firm accounting for less than 0.6 percent of the nation's housing production. As a consequence, mergers and acquisitions have generally not been discouraged by the Department of Justice or the Federal courts.

#### Financial Performance Of Major Builders

Assessing the financial performance of the traditional homebuilding industry is extremely difficult, and any generalizations made about this area must be particularly guarded. Because of the fragmented nature of the industry, and the fact that so many firms are not public, no meaningful statistics have been collected for the bulk of U.S. homebuilders, which are mainly proprietorships, partnerships, and closely-held private corporations.

Moreover, even among publicly held corporations and subsidiaries that must provide public financial statements, nonhomebuilding activities undertaken by these corporations are combined with the financial results for homebuilding activities. Unfortunately, these nonhomebuilding activities, such as hotel operations, land development, multifamily management operations, and recreational developments often constitute a significant portion of the corporations' revenues. As a further complicating factor, the accounting profession is currently redefining some important principles that apply to homebuilders. As a result, year-to-year comparisons may be somewhat misleading.

Despite these constraints, however, an analysis of the financial performance of 11 large, publicly held homebuilders with relatively unencumbered income statements provides some useful insights into the profit economics of at least the largest participants in the industry. Historical financial data for these companies from 1969 through 1972 are presented in

Exhibits 2-11 and 2-12. As the exhibits show, the financial results have been somewhat uneven in terms of three generally recognized indicators of profitability for homebuilders - financial leverage, profit margins, and the velocity of asset utilization:

- ¶ Financial leverage. Financial leverage is defined as the firm's ability to augment its own equity with the financial resources of others - e. g. , through issuing long-term debt and drawing on lines of credit. As shown on these exhibits, the smaller the equity is as a percentage of assets - i. e. , the higher its leverage - the higher the return on equity, or profit. Hence, 1970 showed the most profitable aggregate return on equity (33.8 percent) and the lowest equity-to-assets ratios (31.8). Conversely, 1969 showed the least attractive return on equity average (17.5) and, as would be expected, a high equity-to-assets ratio (35.7).
- ¶ Profit margins. The second major factor affecting profitability is profit margins, or return on sales. Although individual companies have experienced fluctuations in profit margins, return on sales has not varied markedly in aggregate over the past 4 years - i. e. , from 4.8 percent in 1969 to 5.6 percent in 1972.
- ¶ Velocity of asset utilization. The third major component of the homebuilders' profit mechanism is the velocity of asset utilization, or the dollar volume of sales as a multiple of assets employed. The basic rule applied is that the more assets that are utilized (or turned over) to make a profit, the lighter the burden of their fixed costs - i. e. , interest and dividends. Over the last 4 years, asset velocity has declined, most likely as a result of the larger volumes and higher costs generated by the publicly held builders.

Of course, if any one of the key factors - leverage, profit margins, or asset velocity - is extraordinarily poor, return on equity will suffer.

#### THE MOBILE HOME MANUFACTURING SECTOR

Mobile home manufacturing, a fast-growing segment of the housing industry, is quite unlike the homebuilding sector in several respects. First, it is a highly concentrated segment represented by fewer than 400 firms, most of which are now publicly held. Mobile home manufacturers are generally well-capitalized organizations that undertake classic production line



fabrication and distribution through dealerships. On the other hand, mobile home manufacturing has several characteristics in common with homebuilding. Typically a regional business, it is becoming more concentrated, in part due to heavy acquisition activity. In addition, financial performance has been somewhat uneven.

Industry  
Concentration

The Mobile Homes Manufacturers Association estimates that about 335 mobile home manufacturers are operating in the United States, a number less than one-half of one percent of those firms engaged in traditional, on-site homebuilding. Among this relatively small number of companies, industry activity has become increasingly concentrated among the largest firms. Specifically, the market share of the top 25 producers in terms of unit volume has grown from 53 to 63 percent during the 4-year period between 1968 and 1972 (Exhibit 2-13).

The reasons behind this concentration can be traced to the nature of the industry. Unlike the craft-type operation of on-site homebuilders, the operations of mobile home manufacturers lend themselves to economies of scale and other operating benefits achieved through increases in size. In an industry where the cost of purchased materials typically accounts for over 50 percent of the total cost per unit, purchasing control and quantity price agreements are particularly significant. In fact, one of the top mobile home manufacturers believes that purchasing power and skill have been the key factors in maintaining high profitability in the face of escalating materials costs.

Although it cannot be determined whether concentration will continue, most of the largest mobile home manufacturers have built extensive new facilities over the last few years and have ambitious plans for the future. In 1972, for example, one of the top five producers added 10 new plants and anticipates adding another 10 each year for the next 4 years. Similarly, 7 of the 32 companies with sales in excess of \$25 million added an average of 2 and 3 plants last year. While it is difficult to identify the type and amount of expansion that is occurring within the smaller, privately held companies, one can speculate that their rate of expansion is not as high due to comparatively limited capital resources.

The benefits of economies of scale, purchasing power and broad geographic penetration have been instrumental in spurring the high level of merger and acquisition activity that has occurred in this industry segment,

particularly during the late 1960s and to a lesser extent thus far in the 1970s (Exhibit 2-14). From 1969 to 1971, merger and acquisition activity in the mobile home manufacturing sector exceeded levels in the overall manufacturing and mining industries - i. e., 0.466 mergers/acquisitions per company\* compared to 0.17 for the 200 largest manufacturing and mining concerns. This level of activity is less than that in the traditional home-building industry, primarily because the industry is smaller and much more concentrated, thereby limiting the number of possible mobile home manufacturers that are candidates for merger and acquisition.

An analysis of mergers and acquisitions recorded by Standard and Poor's during the 1962 to 1972 decade shows that nearly 120 such actions involved mobile home concerns (Exhibit 2-15). Of these, the largest number - over 40 percent - were combinations of mobile home manufacturers that provided production or purchasing economies of scale and perhaps, most importantly, geographic penetration. In order for a mobile home manufacturer to penetrate a new market, it must either build or acquire a plant in that locale itself. This is because the high cost of transporting mobile homes essentially limits the profitable distribution of mobile homes to within 300 to 500 miles of the manufacturing facility.\*\*

While the great bulk of mergers and acquisitions over the last decade have been within the industry itself, 23 percent of the actions identified have been recent acquisitions by large diversified corporations seeking a share of the industry's growth in sales and earnings. In such cases, large publicly held corporations have acquired some of the highest volume producers in the industry. Specifically, 3 of the top 10 mobile home manufacturers, which together accounted for more than \$300 million in sales in 1972, have become subsidiaries of large, diversified corporations in the last few years.

#### Operating Characteristics

While the production of mobile homes is highly concentrated, the typical distribution and retailing systems are not. Most mobile home manufacturers distribute their homes through an estimated 10,500 nonexclusive mobile home dealers, although some manufacturers have diversified into

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\* - For 35 of the largest publicly held mobile home establishments for which public information is available.

\*\* - The transportation costs of mobile homes range from 60 cents to 90 cents per mile excluding tolls.

SINGLE-FAMILY HOUSING TECHNOLOGY

retailing themselves. The independent retail outlets are often small, generating annual sales of less than \$500,000, and they almost always carry the lines of competing manufacturers.

Like homebuilders, mobile home manufacturers typically are local operations. Because the high cost of transporting mobile homes limits markets geographically, state and regionally based businesses are the norm in the industry. As a result, many small manufacturers have been able to survive in their locales despite the presence of large manufacturers in the industry. Only the top five producers, for example, operate on a nationwide basis, having from 24 to 56 plants each. The remaining top 25 manufacturers tend to distribute in one or two regions, operating from four to nine plants.

The geographic limitations on production and distribution have also led to concentration of producers in those areas where consumer demand is highest. As Exhibit 2-16 shows, mobile home plant output has continued to be even more concentrated in the South, where the retirement and non-urban, blue-collar markets are particularly strong. In turn, production in the North Central states, the other traditional market area, has declined somewhat.

As with homebuilders and in conjunction with merger and acquisition activity on the part of larger firms, the degree of public ownership has increased substantially over the past several years. Of large mobile home manufacturers, \* over 90 percent are publicly held (or subsidiaries of publicly held enterprises), compared to 64.5 percent in 1969 (Exhibit 2-17).

### Financial Performance

Although financial data are only available for the large, publicly held organizations, performance trends can be discerned. An analysis of 10 of the largest firms whose principal business is mobile home manufacturing shows an uneven pattern of performance over the past 4 years. This uneven performance is a result of fluctuations in profit margins, leverage, and asset velocity (Exhibits 2-18 and 2-19).

Profit margins, an important variable in this classic production line industry, have varied from 3.95 percent in 1969 to a low of 3.3 percent in

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\* - The 32 mobile home manufacturers with 1972 sales exceeding \$20 million, of which at least 50 percent were derived from the manufacture of mobile homes.

SINGLE-FAMILY HOUSING TECHNOLOGY

1972, with intervening fluctuations in 1971 and in 1970. In general, return on equity (profitability) has been highest in those years with the highest profit margins (or return on sales). For example, in 1969 and 1971 when profit margins were highest (i. e. , 3.95 percent and 3.8 percent), returns on equity were most attractive (i. e. , 33.9 percent and 35.8 percent). Conversely, 1972, the year of poorest aggregate performance (20.3 percent return on equity), also was a year of low profit margins (3.3 percent). In this high-volume industry, it should be noted that profit margins are not nearly so high as for some of the largest traditional homebuilding companies, where return on sales typically runs 5 to 6 percent.

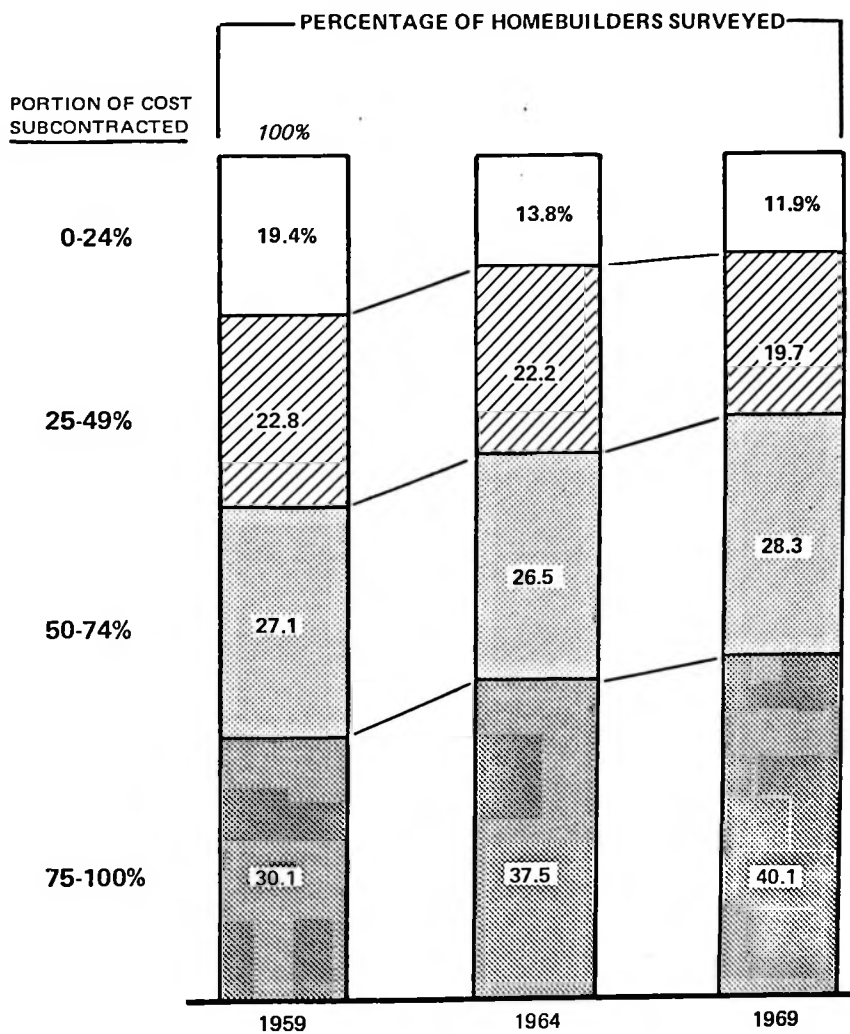
Financial leverage has also shown an uneven pattern in the aggregate. Equity as a percentage of assets has been at about 54 percent for 1969 and 1972, but significantly higher for 1970 and 1971. Mobile home manufacturers have a higher degree of equity financing than major homebuilders, whose equity, as a percentage of assets, averages from 30 to 47 percent.

One distinct trend among large, publicly held mobile home manufacturers has been a decreasing level of asset velocity. Aggregate sales to asset ratios have decreased from 4.612 in 1969 to 2.779 in 1972. Although asset turnover is decreasing dramatically (probably as a result of increased size), it is important to note that it still exceeds traditional homebuilder velocity by a factor of two.

\* \* \*

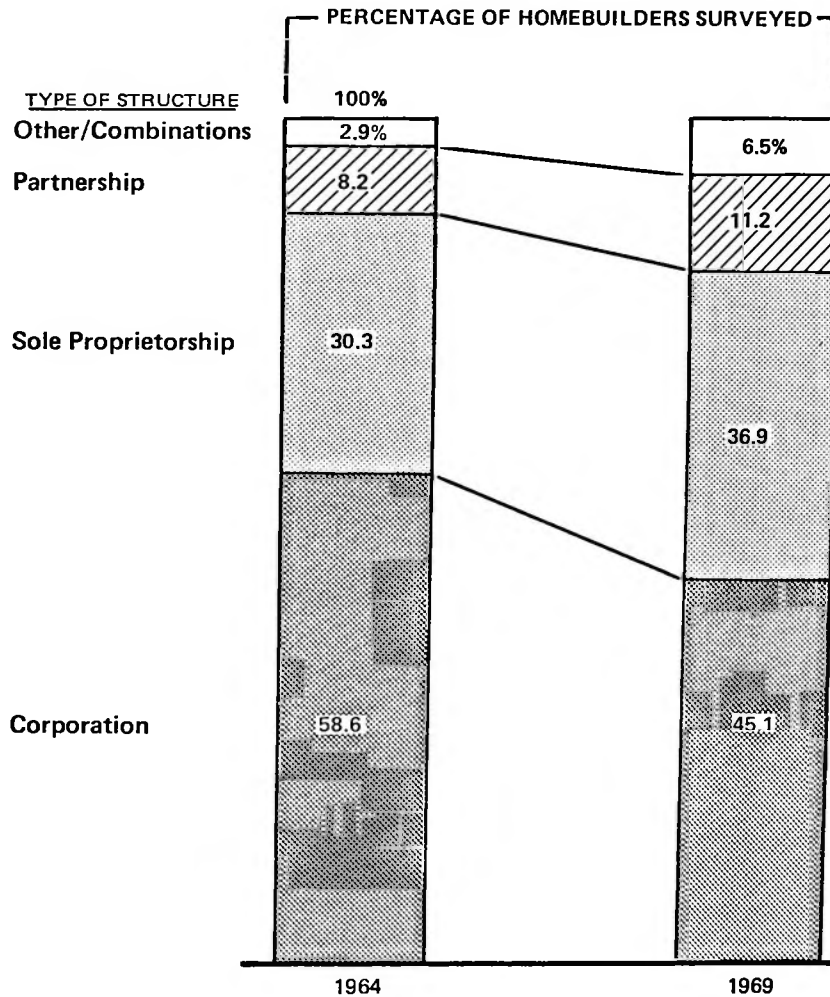
In sum, traditional homebuilding and mobile home manufacturing are sharply distinct sectors of the housing industry. The homebuilding sector is extremely fragmented, deriving its production primarily from thousands of small custom and merchant builders, many of which enter and leave the industry as market conditions dictate. In contrast, the mobile home sector is essentially a manufacturing, assembly line business dominated by a handful of large corporations. However, the lines drawn between these two sectors are beginning to blur to some extent. As will be described in the section on technological advances, some of this convergence can be traced to the increased industrialization of the industry and advances in technology that have enabled homebuilders to realize the economies of factory-produced housing.

**THE AMOUNT OF SUBCONTRACTING BY HOMEBUILDERS IS LARGE AND HAS INCREASED SUBSTANTIALLY . . .**



Source: *Surveys of National Association of Homebuilders.*

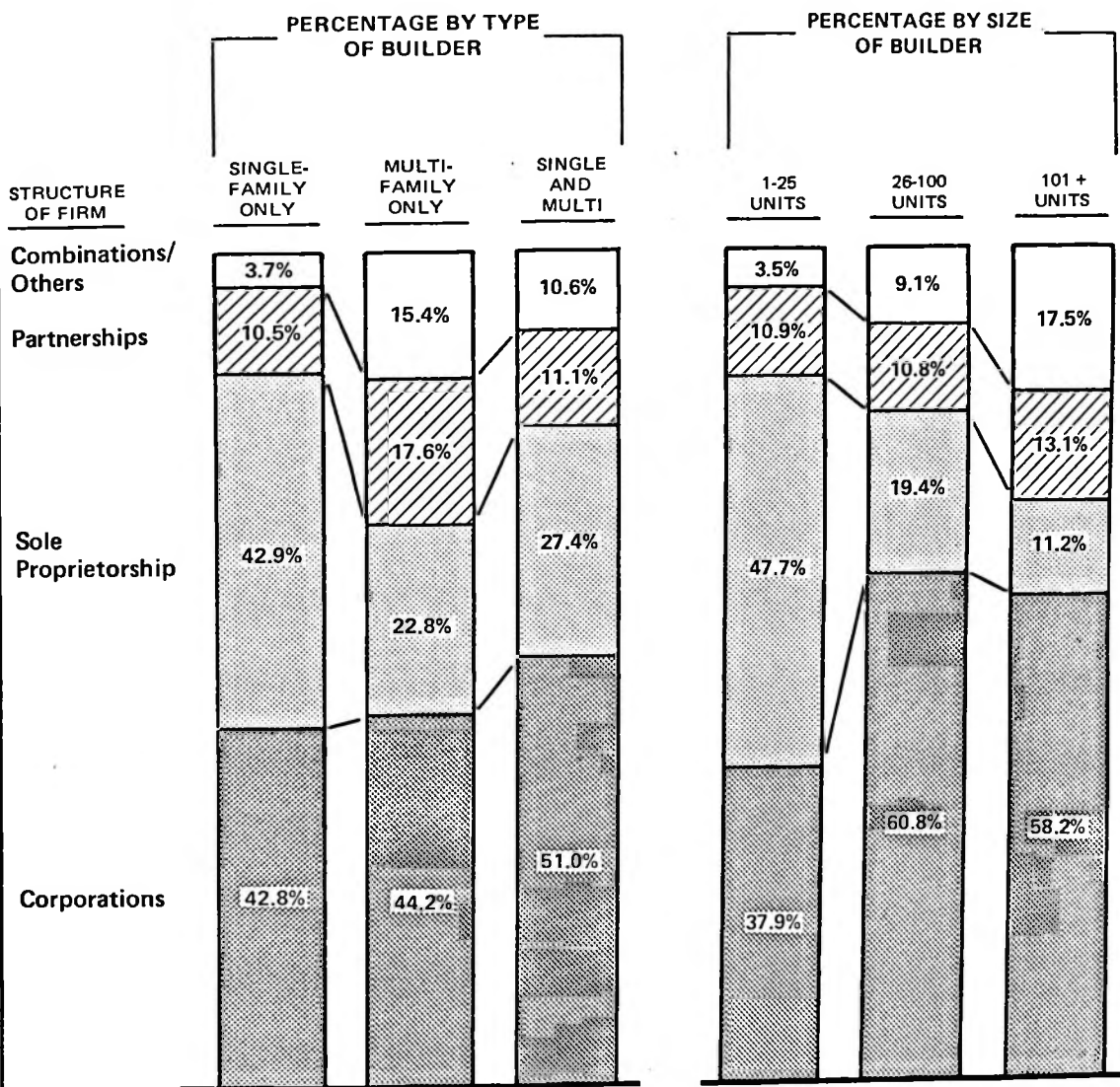
THE PROPORTION OF SOLE PROPRIETORSHIPS HAS INCREASED, WHILE THE CORPORATE FIRM OF ORGANIZATION HAS DECLINED . . .



Source: Surveys of National Association of Homebuilders.

SINGLE-FAMILY HOUSING

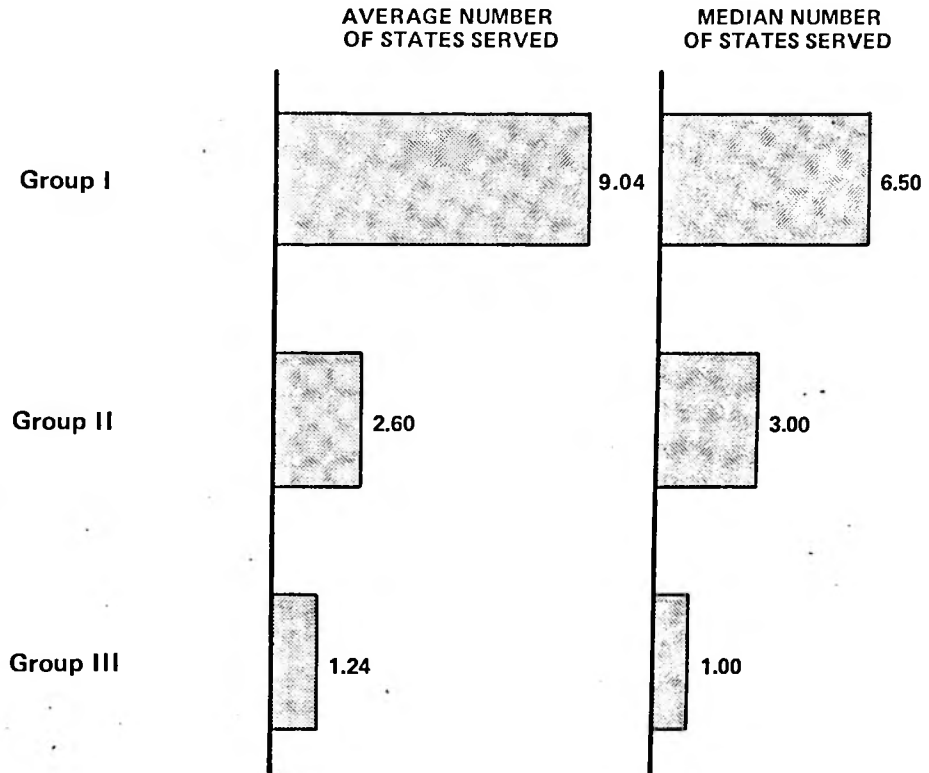
SOLE PROPRIETORSHIPS ARE MORE COMMON WITH THE SMALLER BUILDERS . . .



Source: 1969 survey by National Association of Homebuilders.

SINGLE-FAMILY HOUSING

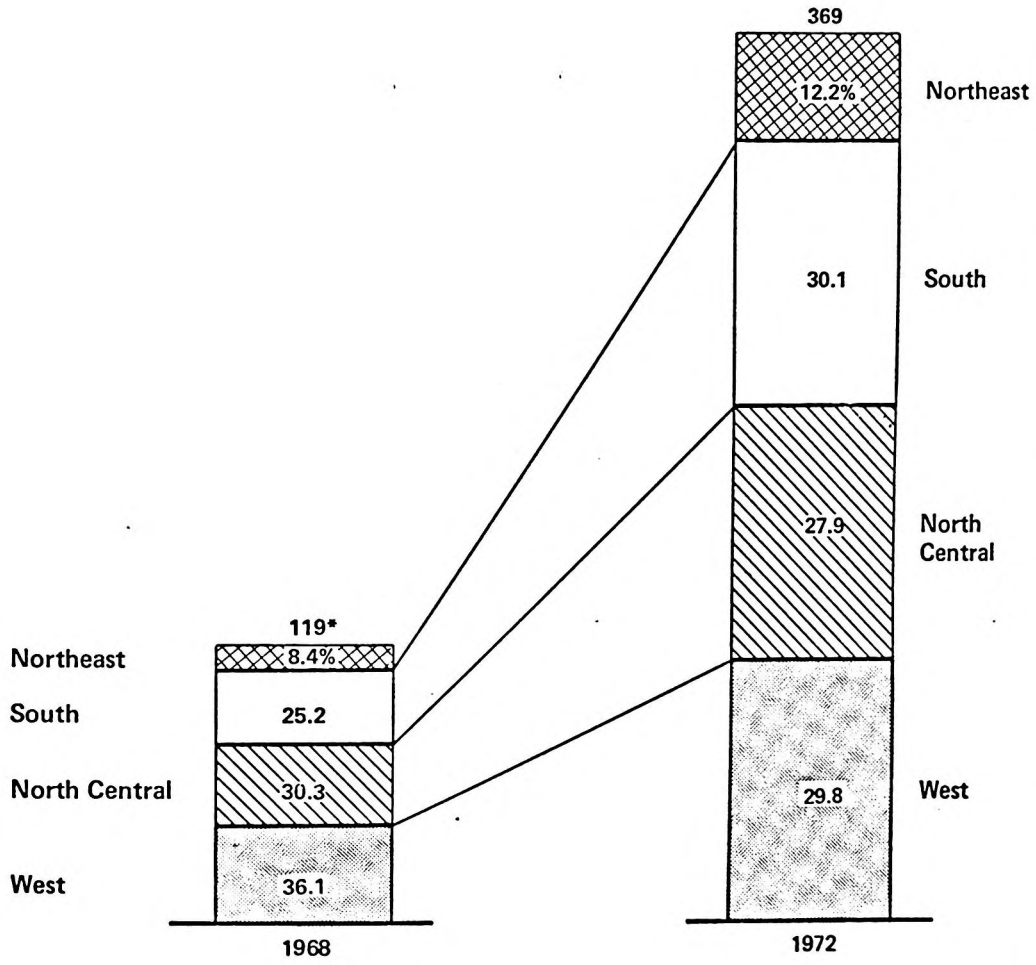
THERE IS A DIRECT RELATIONSHIP BETWEEN THE SIZE OF THE HOMEBUILDER AND THE NUMBER OF STATES SERVED . . . .



Source: Bluebook of Major Homebuilders.



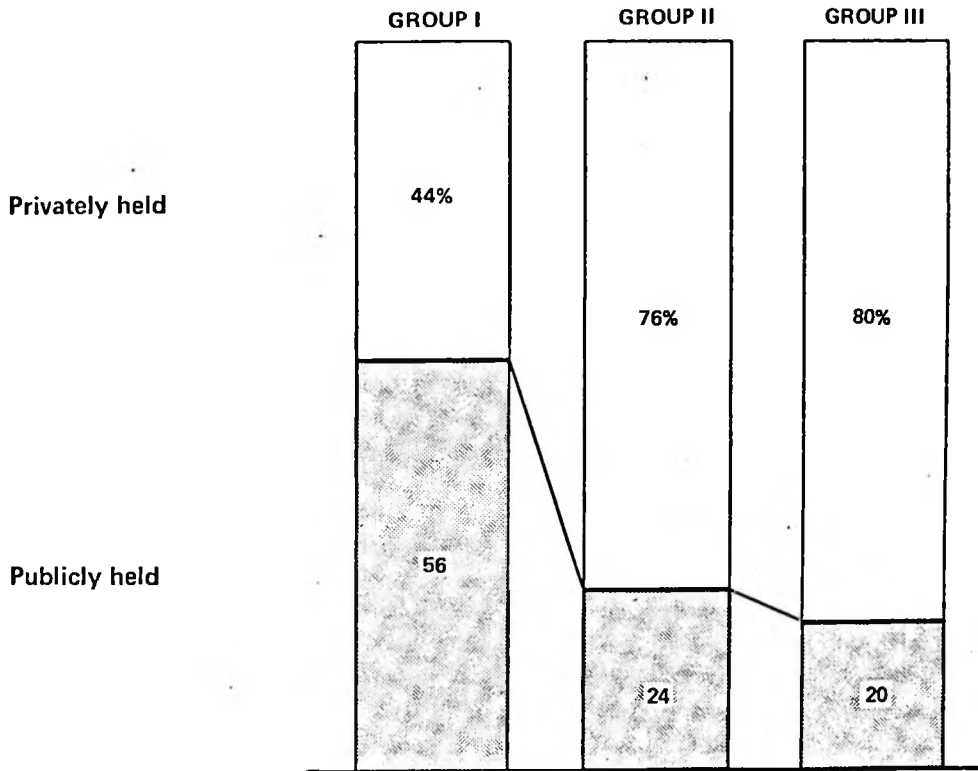
REGIONAL CONCENTRATION OF MAJOR HOMEBUILDERS HAS EVENED OUT SOMEWHAT SINCE 1968 . . . .



\* Number of headquarters.  
 Source: *Professional Builder* magazine.

SINGLE-FAMILY HOUSING

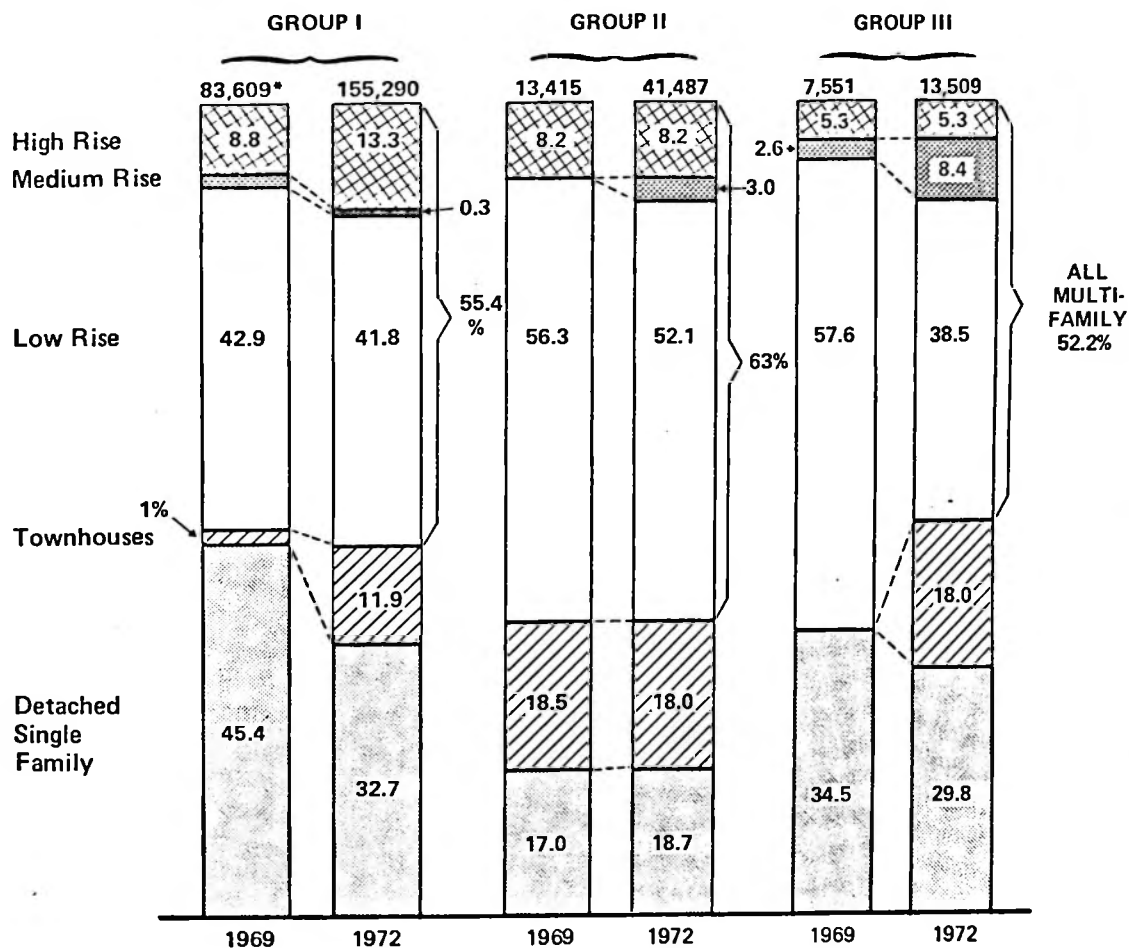
INCIDENCE OF PUBLIC OWNERSHIP INCREASES WITH THE SIZE OF BUILDER . . . .



Sources: *Bluebook of Major Homebuilders*; *Standard and Poor's*.

SINGLE-FAMILY HOUSING

**MOST LARGE HOMEBUILDERS CONCENTRATE MORE ON MULTIFAMILY HOMES AND LESS ON SINGLE-FAMILY HOUSES . . .**

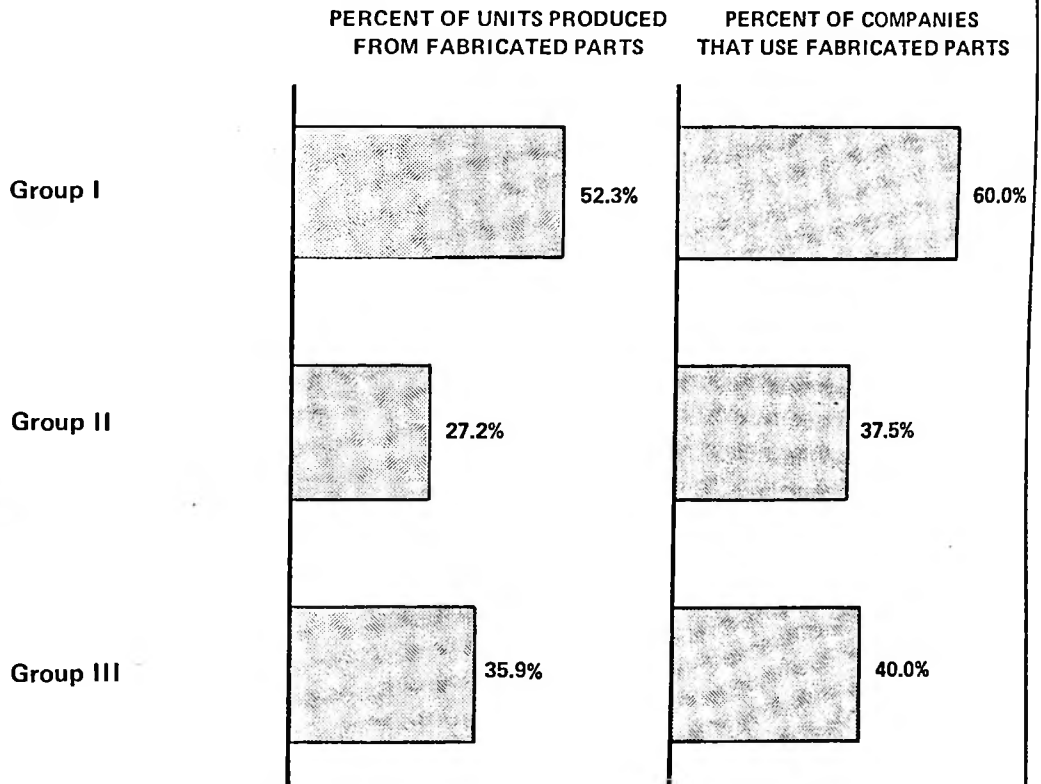


\*Volume in units.

Source: Bluebook of Major Homebuilders.

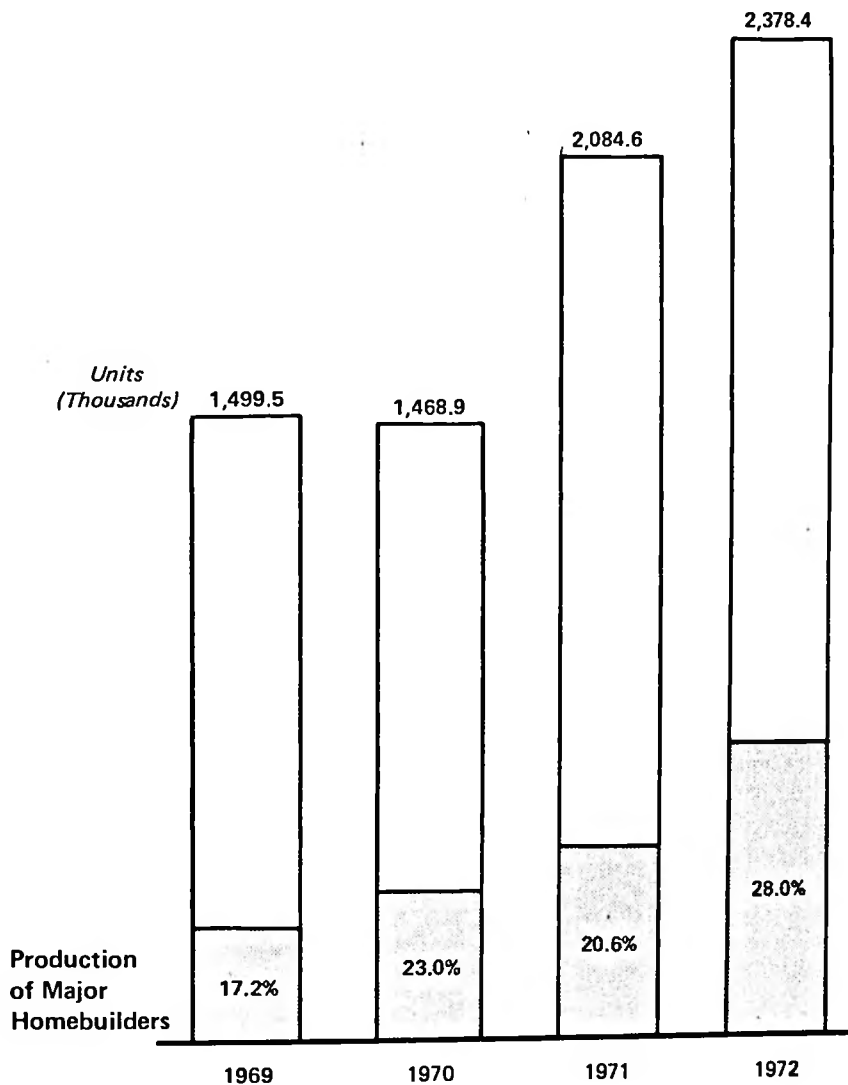
SINGLE-FAMILY HOUSING

THE LARGER HOMEBUILDERS USE FABRICATED PARTS/COMPONENTS MORE EXTENSIVELY THAN THE SMALLER HOMEBUILDERS . . .



Source: 1973 Bluebook of Major Homebuilders.

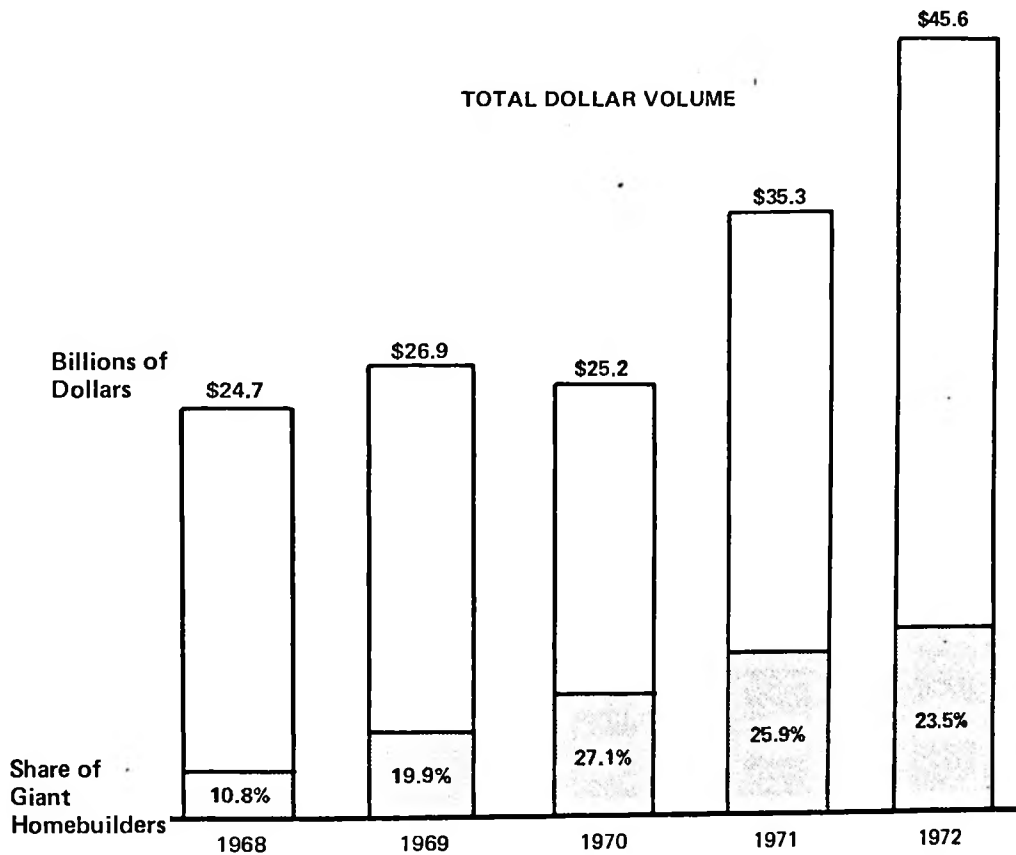
IN THE PAST 4 YEARS, EXCEPT FOR 1971, MARKET SHARE OF MAJOR HOMEBUILDERS HAS GROWN CONSISTENTLY . . . .



Sources: *Bluebook of Major Homebuilders*; U.S. Department of Commerce, C20-73-3.

SINGLE FAMILY HOUSING

ALTHOUGH THE NUMBER OF UNITS PRODUCED BY THE LARGER HOMEBUILDERS HAS INCREASED STEADILY, THEIR SHARE OF TOTAL DOLLAR VOLUME HAS NOT . . .



Sources: *Professional Builder* magazine; Department of Commerce.

SINGLE-FAMILY HOUSING

## FINANCIAL PERFORMANCE OF MAJOR HOMEBUILDERS

COMPANY	RETURN ON EQUITY	RETURN ON ASSETS	GROSS MARGIN	RETURN ON SALES	EQUITY AS A % OF ASSETS	SALES/ ASSETS
<u>1969</u>						
Hallcraft Homes	NA	NA	NA	NA	NA	NA
McKeon Construction	6.3%	1.3%	18.4%	4.1%	NA	330
Alodex Corp.	NA	NA	NA	NA	26.7%	NA
Centex Corp.	NA	NA	NA	NA	17.9	NA
Devel. Cp. Amer.	21.2	5.6	19.1	5.0	26.5	1.137
Hoffman-Rosner Corp.	25.6	10.4	20.5	5.6	48.8	1.840
Kaufman & Broad	12.4	4.5	21.4	4.6	36.4	.982
Lennar Corp.	NA	NA	NA	NA	12.6	NA
Ryan Homes	21.9	14.1	15.8	4.5	64.4	3.162
Shapell Ind.	NA	NA	NA	NA	59.7	NA
U.S. Home	NA	NA	NA	NA	28.3	NA
Average	17.5%	7.2%	19.0%	4.8%	35.7%	1.490
<u>1970</u>						
Hallcraft Homes	38.7%	5.1%	14.0%	2.75%	25.0%	1.256
McKeon Construction	43.8	9.3	28.9	7.34	18.9	.787
Alodex Corp.	0.6	0.1	10.3	0.10	15.7	.981
Centex Corp.	63.4	6.5	9.0	5.10	11.4	.872
Devel. Cp. Amer.	NA	NA	19.7	NA	28.8	1.219
Hoffman-Rosner Corp.	3.3	1.4	20.2	1.39	43.9	.863
Kaufman & Broad	17.6	6.4	21.2	4.31	27.7	.970
Lennar Corp.	97.1	12.1	22.3	8.57	16.2	.932
Ryan Homes	23.7	15.3	16.9	4.63	61.9	2.378
Shapell Ind.	12.5	7.4	25.8	13.43	61.0	.503
U.S. Home	37.5	7.4	24.1	5.04	39.3	.924
Average	33.8%	7.1%	19.3%	5.3%	31.8%	1.057

Source: *Professional Builder* magazine.

NA = Not available.

SINGLE-FAMILY HOUSING

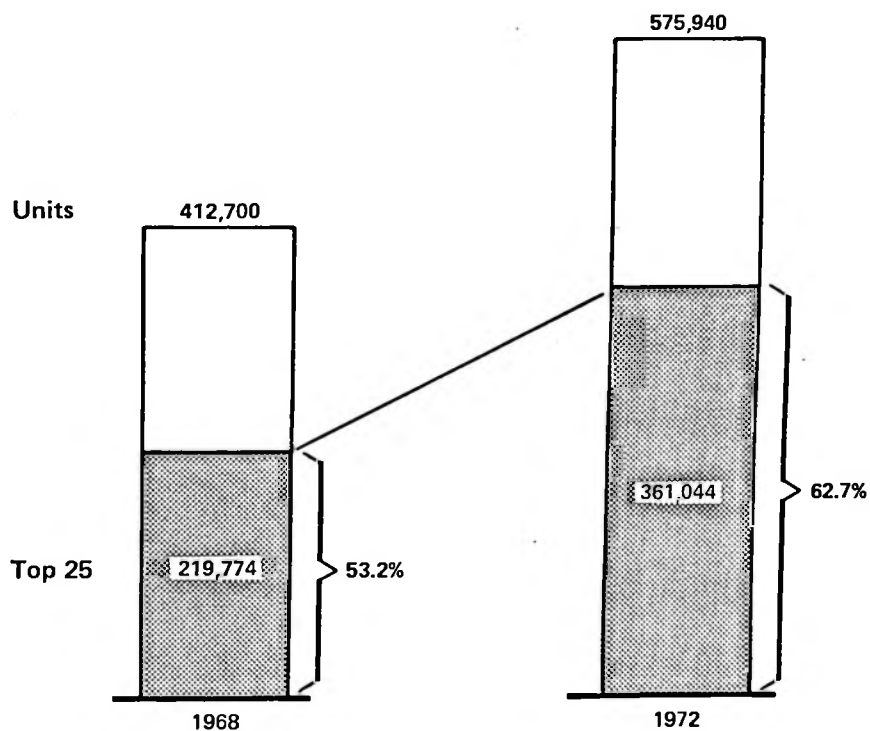
## FINANCIAL PERFORMANCE OF MAJOR HOMEBUILDERS

COMPANY	RETURN ON EQUITY	RETURN ON ASSETS	GROSS MARGIN	RETURN ON SALES	EQUITY AS A % OF ASSETS	SALES/ ASSETS
<b>1971</b>						
Hallcraft Homes	38.7%	5.1%	14.0%	2.75%	25.0%	1.256
McKeon Construction	31.7	7.6	NA	6.28	21.9	.731
Alodex Corp.	1.0	0.2	19.1	0.25	44.8	.527
Centex Corp.	NA	NA	NA	4.66	NA	NA
Devel. Cp. Amer.	NA	NA	NA	NA	NA	NA
Hoffman-Rosner Corp.	NA	NA	NA	NA	NA	NA
Kaufman & Broad	22.8	6.3	19.3	4.37	40.4	.933
Lennar Corp.	151.0	24.5	26.6	12.50	35.3	1.165
Ryan Home	25.9	16.1	17.9	5.44	48.0	2.216
Shapell Ind.	13.9	8.5	21.2	9.40	53.7	.699
U.S. Homes	29.5	11.6	NA	5.49	30.8	1.048
<b>Average</b>	<b>31.8%</b>	<b>10.0%</b>	<b>19.7%</b>	<b>5.7%</b>	<b>37.5%</b>	<b>1.072</b>
<b>1972</b>						
Hallcraft Homes	18.7%	4.7%	13.0%	2.3%	19.3%	1.257
McKeon Construction	10.2	2.2	NA	3.7	NA	NA
Alodex Corp.	1.9	0.8	20.9	1.3	24.7	.463
Centex Corp.	19.8	5.9	NA	4.9	NA	NA
Devel. Cp. Amer.	42.6	12.8	27.6	9.3	31.9	.865
Hoffman-Rosner Corp.	9.6	2.7	NA	1.9	NA	NA
Kaufman & Broad	25.8	3.9	18.8	6.9	52.9	1.003
Lennar Corp.	59.5	21.0	23.6	12.1	64.0	1.144
Ryan Home	31.7	15.2	17.5	5.4	47.3	2.182
Shapell Ind.	15.3	8.2	20.9	8.7	48.9	.747
U.S. Homes	26.3	8.1	NA	5.3	NA	NA
<b>Average</b>	<b>23.8%</b>	<b>7.8%</b>	<b>20.3%</b>	<b>5.6%</b>	<b>41.3%</b>	<b>1.094</b>

Source: *Professional Builder* magazine.  
NA = Not available.



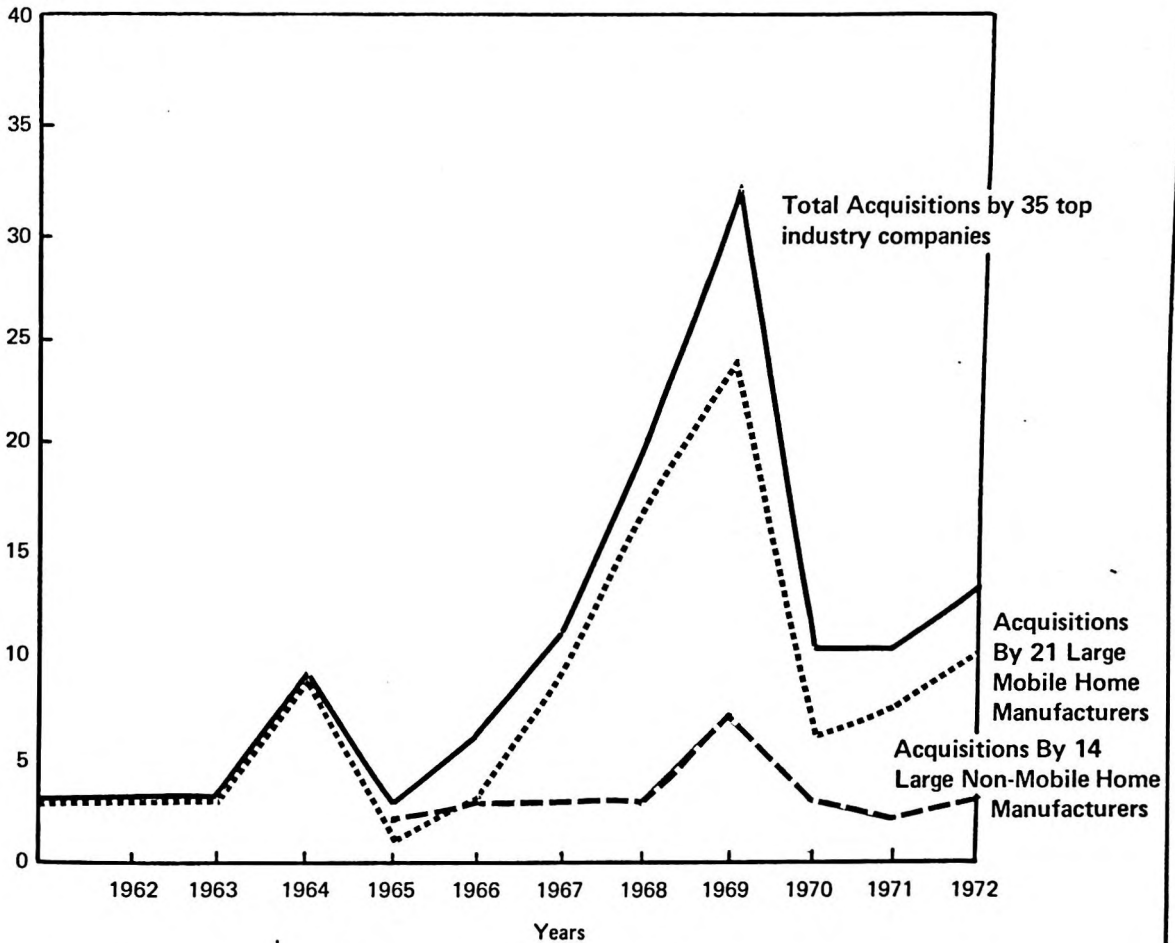
THE TOP 25 MOBILE HOME MANUFACTURERS IN TERMS OF UNIT VOLUME  
HAVE INCREASED THEIR MARKET SHARE MEASURABLY . . .



Source: Automation and Housing magazine.

ACQUISITION ACTIVITY IN THE MOBILE HOME INDUSTRY WAS PARTICULARLY HEAVY IN THE LATE SIXTIES, BUT APPEARS TO BE LEVELING OF SOMEWHAT . . .

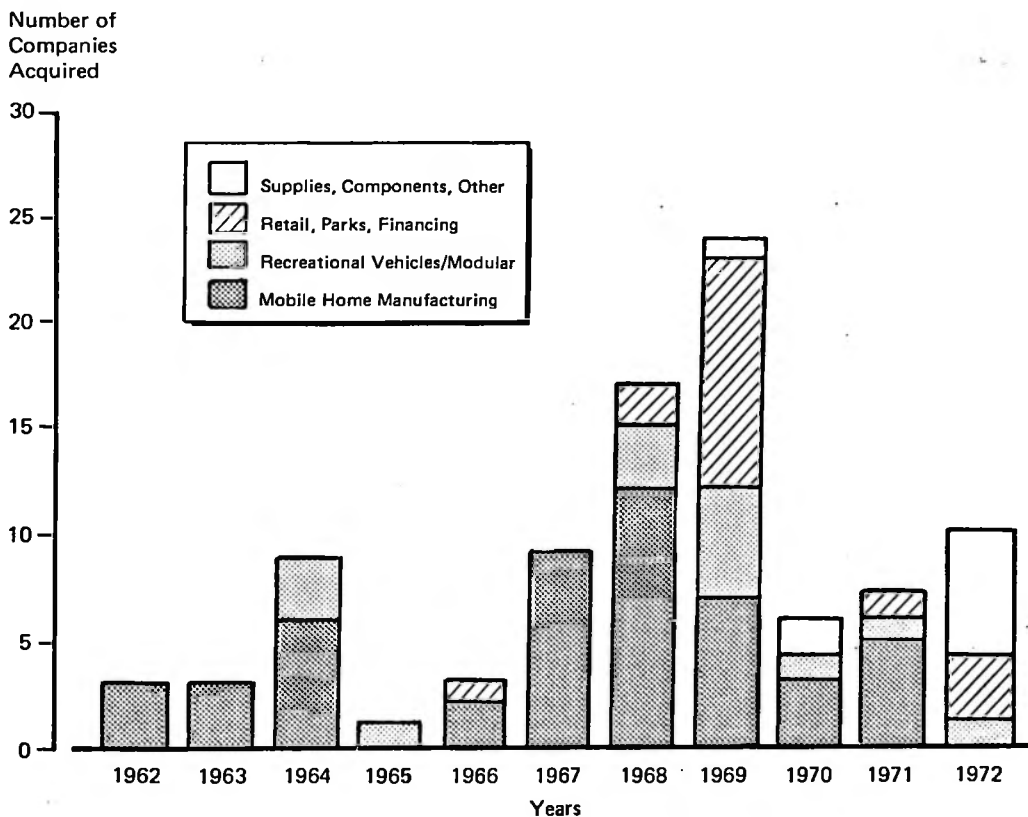
Number of Companies Acquired



Source: Standard and Poor's - 21 selected mobile home manufacturers.

9 - PRODUCT SERVICES IN SINGLE-FAMILY HOUSING TECHNOLOGY

ACQUISITIONS BY MOBILE HOME MANUFACTURERS HAVE BEEN PRIMARILY OTHER MOBILE HOME MANUFACTURERS, BUT RECENTLY GREATER DIVERSIFICATION HAS BEEN OCCURRING . . . .

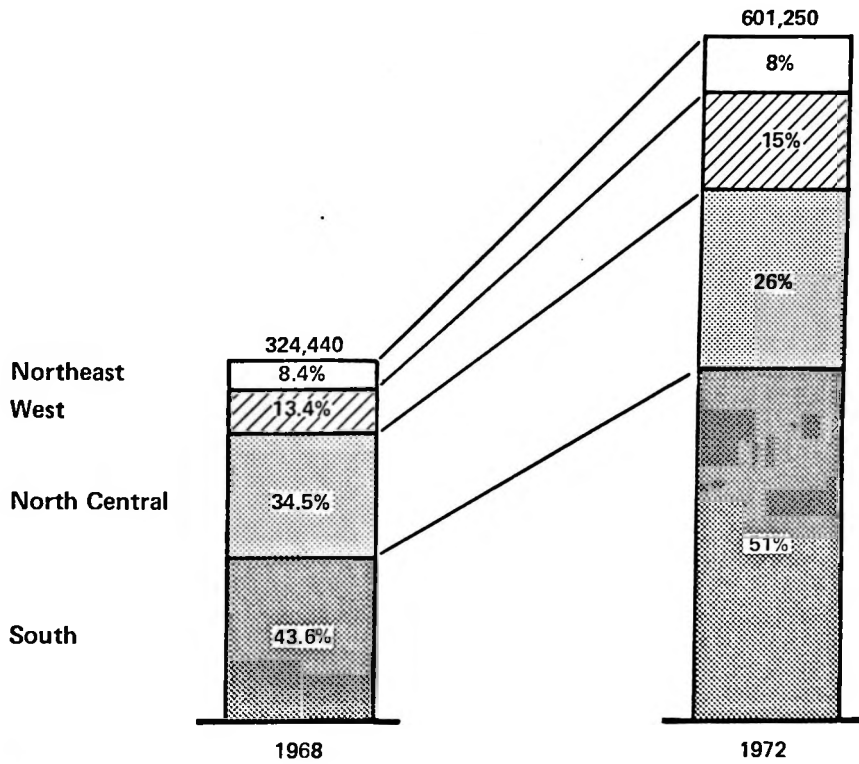


Source: Standard and Poor's - 21 selected mobile home manufacturers.

SINGLE-FAMILY HOUSING

EXHIBIT 2-15

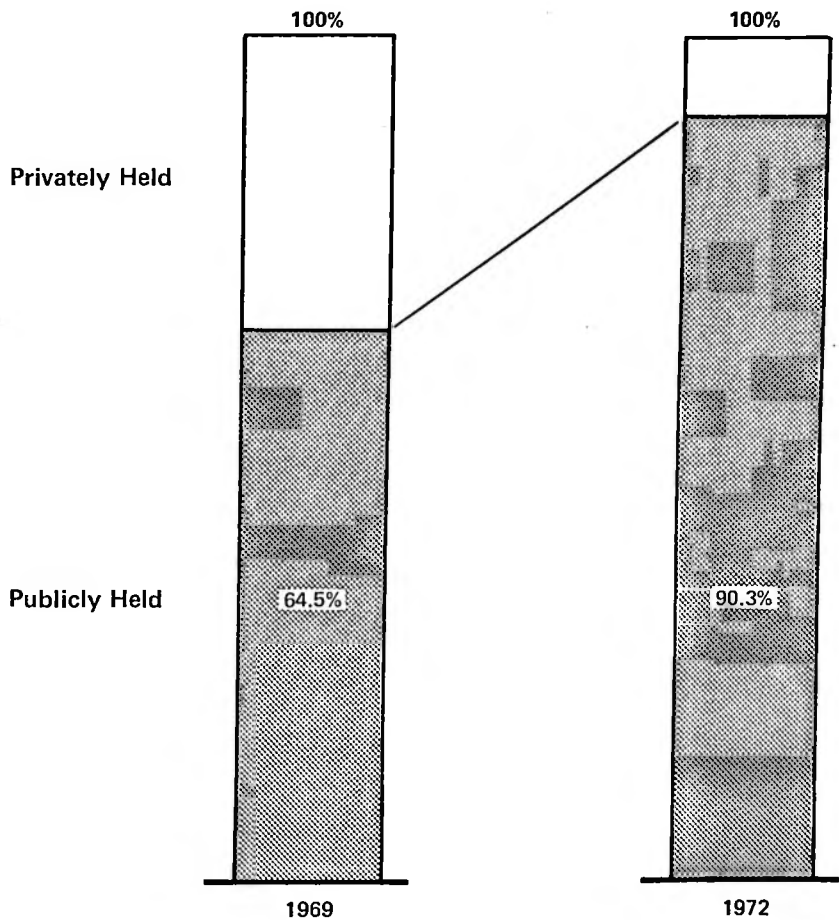
REGIONAL CONCENTRATION OF MOBILE HOME PLANT OUTPUT HAS BECOME EVEN GREATER IN THE SOUTH THAN BEFORE . . . .



Source: Mobile Homes Manufacturers Association.

3 - PRODUCT TRENDS IN SINGLE-FAMILY HOUSING  
LEARNING I

**PUBLIC OWNERSHIP OF MOBILE HOME MANUFACTURERS HAS INCREASED RAPIDLY SINCE 1969 . . . .**



*Source: 32 largest publicly held mobile home manufacturers (with 1972 sales exceeding \$20 million, at least 50 percent of which derived from the manufacture of mobile homes).*

S - PRODUCT TRENDS IN SINGLE-FAMILY HOUSING TECHNOLOGY

## FINANCIAL PERFORMANCE OF MAJOR MOBILE HOME MANUFACTURERS

COMPANY	RETURN ON EQUITY	RETURN ON ASSETS	GROSS MARGIN	RETURN ON SALES	EQUITY AS A % OF ASSETS	SALES/ ASSETS
<u>1969</u>						
Skyline Corp.	50.9%	28.9%	NA	4.77%	55.9%	6.05
Fleetwood Enterprises	47.9	24.0	NA	4.23	50.0	5.68
Zimmer Homes	19.7	14.0	NA	3.65	77.4	3.83
Commodore Corp.	27.1	9.8	NA	2.95	46.6	3.32
Kit Manufacturing	33.9	14.2	NA	3.53	49.4	4.05
De Rose Industries	32.1	18.9	NA	3.92	70.0	4.79
Liberty Homes	NA	NA	NA	6.42	NA	NA
Monarch Industries	26.4	6.1	NA	1.17	19.8	5.20
Golden West Mobile Homes	33.3	19.4	NA	4.88	64.4	3.98
Nobility Homes	NA	NA	NA	NA	NA	NA
Average	33.9%	16.9%	NA	3.95%	54.2%	4.61
<u>1970</u>						
Skyline Corp.	52.6%	29.4%	17.2%	5.27%	69.4%	4.851
Fleetwood Enterprises	36.9	22.5	NA	4.53	NA	NA
Zimmer Homes	1.4	1.1	10.4	0.50	80.4	2.320
Commodore Corp.	NA	NA	13.1	NA	29.1	1.966
Kit Manufacturing	13.2	6.5	NA	1.95	48.5	2.904
De Rose Industries	26.4	18.6	16.3	4.26	76.2	3.738
Liberty Homes	55.2	34.2	22.9	7.61	70.4	3.297
Monarch Industries	6.7	1.3	10.8	0.37	26.9	3.799
Golden West Mobile Homes	18.7	12.2	NA	4.15	76.0	2.884
Nobility Homes	NA	NA	NA	NA	NA	NA
Average	26.4%	15.7%	15.1%	3.58%	59.6%	3.220

Source: *Professional Builder* magazine.

NA = Not available.

## FINANCIAL PERFORMANCE OF MAJOR MOBILE HOME MANUFACTURERS

COMPANY	RETURN ON EQUITY	RETURN ON ASSETS	GROSS MARGIN	RETURN ON SALES	EQUITY AS A % OF ASSETS	SALES/ ASSETS
<b>1971</b>						
Skyline Corp.	47.7%	33.1%	17.2%	5.7%	70.6%	4.191
Fleetwood Enterprises	45.0	28.3	NA	4.5	NA	NA
Zimmer Homes	4.7	3.8	11.3	1.4	75.5	2.428
Commodore Corp.	NA	NA	NA	NA	23.9	2.120
Kit Manufacturing	17.0	8.3	14.2	2.2	47.0	3.073
De Rose Industries	16.6	12.7	15.3	3.4	77.6	3.264
Liberty Homes	41.6	29.3	21.2	7.0	78.7	3.285
Monarch Industries	NA	NA	11.1	0.8	27.0	3.432
Golden West Mobile Homes	19.9	15.0	16.7	3.2	58.8	3.054
Nobility Homes	94.0	41.6	NA	5.7	55.8	2.876
<b>Average</b>	<b>35.8%</b>	<b>21.5%</b>	<b>15.2%</b>	<b>3.8%</b>	<b>57.2%</b>	<b>3.080</b>
<b>1972</b>						
Skyline Corp.	46.5%	32.8%	16.8%	6.0%	72.7%	3.955
Fleetwood Enterprises	32.2	19.4	NA	4.3	NA	NA
Zimmer Homes	3.6	2.7	10.3	1.0	60.6	2.087
Commodore Corp.	9.4	2.1	12.4	7.4	23.0	2.661
Kit Manufacturing	16.8	7.9	14.0	2.0	39.4	2.761
De Rose Industries	3.7	2.9	11.0	0.8	70.9	3.099
Liberty Homes	16.1	12.7	17.4	3.7	73.5	2.774
Monarch Industries	9.5	2.6	12.5	0.7	31.3	3.847
Golden West Mobile Homes	18.7	10.6	14.4	2.2	63.5	4.456
Nobility Homes	46.8	26.1	14.9	5.1	55.0	3.374
<b>Average</b>	<b>20.3%</b>	<b>12.0%</b>	<b>13.7%</b>	<b>3.3%</b>	<b>54.4%</b>	<b>2.779</b>

Source: *Professional Builder* magazine.  
NA = Not available.

### 3 - PRODUCT TRENDS IN SINGLE-FAMILY HOUSING

Single-family housing - still the dominant form of housing in the United States - has experienced several marked changes in recent years. For one, the median sales price for all homes increased 29 percent\* in a 6-year period - almost as high as the rise in median family income. This price increase has occurred during a period when other costs have also risen rapidly (e. g., consumer price index up 28.9 percent, the FHA mortgage interest rates up 20.2 percent). Thus, private homes are even more difficult for the average American to afford.

In addition, the "value" of an American home is declining. While prices have increased steadily, the size of single-family homes (total square footage) has actually decreased during the same period; most simply, the nation's families are paying higher prices for less living space. And although exterior construction materials have not changed significantly, about 39 percent of all homes are now built with the least expensive type of foundation - slab concrete.

Aside from changes in single-family housing, recent data point up distinct regional patterns in housing construction, which vary noticeably across the country. For example, purchase prices in the West rose more slowly than in any other region during the 6-year period. As a further example, urban and suburban homes are larger than rural homes, despite the scarcity of land and higher costs in urban areas. The remainder of this section discusses trends and regional patterns for single-family housing in the areas of purchase prices, overall home size, structure characteristics, and amenities.\*\*

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\* - The increase in median sales price was 31 percent according to the Bureau of Labor Statistics' price index, which is based on FHA 203 programs.

\*\* - Unless otherwise noted, all data in this section apply to new, privately owned, detached, single-family homes.



## CHANGES IN PURCHASE PRICE

Although average family incomes have kept pace, the purchase price for single-family homes has mounted rapidly - both in terms of the median price of a new home, and in terms of the price per square foot. Overall, in the 6-year period from 1966 through 1972, the median sales price of a new home rose from \$21,400 to \$27,600 - accounting for a 29 percent increase (Exhibit 3-1). As the exhibit shows, the purchase price increased steadily from 1966 to 1969, dropped off sharply in 1969-1970, and then continued to rise.\* During this period, the median U. S. family income increased about 30 percent (Exhibit 1-6), indicating that about as many families are still "priced out" of single-family homes as in 1966.

### Price Change by Area

These price increases are reflected throughout various areas of the country - although the rates in each area differ from the national average. This holds true for urban and rural areas (as measured by the Bureau of the Census' Standard Metropolitan Statistical Areas), as well as for different geographic regions of the country (following the Bureau's regional categories).

As Exhibit 3-2 shows, while prices have increased throughout the country, important regional differences occurred during the 6-year period from 1966 to 1972:

‡ Northeast. New single-family homes in the Northeast registered the second highest percentage increase - 33.6 percent for the period, or 5.6 percent annually. However, it experienced the greatest absolute dollar increase - i. e., \$7,900 - from \$23,500 in 1966 to \$31,400 in 1972.

‡ South. The median sales price of new homes in the South had the highest percentage increase in the country, a rise of 41.8 percent for the period, or 7.0 percent annually. In dollars, prices rose from \$18,200 to \$25,800 for a \$7,600 increase.

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\* - According to the Bureau of Labor Statistics' price index, the price of existing single-family homes has increased by 39 percent during the past 5 years. And according to the Annual Reports of the National Association of Real Estate Boards, the median sales price for existing single-family homes rose from \$19,350 in 1967 to \$26,860 in 1972 - a level only marginally less than new single-family homes.

- ¶ North Central. In the North Central region, the median sales price rose 26.3 percent (4.4 percent annually) from \$23,200 to \$29,300 for a \$6,100 increase during the period.
- ¶ West. The West showed the smallest percentage increase in median sales price, 18.5 percent for the period or an annual increase of 3.1 percent. In addition, the region experienced the smallest absolute increase - \$4,300 (\$23,200 to \$27,500).

Overall, these increases were ultimately caused by inflationary trends in construction costs during the period. (See the chapter, "Analyzing Trends in Housing Construction and Operating Costs," for a more complete discussion. \*) Variations between regions can be attributed to differences in the availability and cost of land, materials, financing, and labor - as well as to environmental constraints and consumer buying patterns.

#### Price Change Per Square Foot

The growing disparity between housing prices and housing value is a problem felt equally across the nation. In point of fact, during the period when purchase prices were increasing, the size of new homes in terms of total square footage has been decreasing (details of this decline are discussed later). Thus, along with increases in purchase prices, there has been a rise in the price of a home per square foot; stated another way, Americans across the country have seen a decline in the value of the new homes they have purchased.

Specifically, in 1972, homebuyers had to pay \$1.90 or 14.1 percent more per square foot for a single-family home than they did 3 years earlier, in 1969 (Exhibit 3-3). In various regions of the country, the percent increase varied. For example, the Northeast and the South experienced the sharpest increases in median purchase price per square foot - 22.8 percent and 16.9 percent respectively during the same period.

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\* - Analyzing Trends in Housing Construction and Operating Costs, U.S. Department of Housing and Urban Development, August 1973.

## CHANGES IN SIZE OF HOMES

In addition to purchasing price, the size of the nation's homes is a critically important measure of homebuilding trends. Overall, as the following paragraphs discuss, in the period between 1969 and 1971, there was a noticeable decline in the overall size of U.S. single-family homes by almost any measure - e. g., total median square footage, square footage in various mortgage financing categories, in various regions of the country, and in the number of "large" homes. Further, although total floor space has grown smaller, the number of bedrooms and bathrooms has not changed significantly, indicating that Americans are living in smaller - but not fewer - rooms.

### Total Available Floorspace

Because it was so sharp and pervasive, the decline in home size - which was the severest in 1969 - can without question be attributed to a general inflationary trend, combined to a limited extent with the production of Section 235 Program (low-income) housing in certain areas of the country. In terms of square feet of floorspace, the size of new homes from 1966 to 1969 increased 70 square feet (from a median of 1,460 square feet in 1966 to 1,530 square feet in 1969). However, in a single year (1969-1970), there was a dramatic reversal of this trend, with median size dropping 145 square in 1 year (to 1,385 square feet), and then increasing slightly in the next 2 years (Exhibit 3-4).

Looking at size changes for the two largest categories of mortgage financing - FHA-insured and conventional mortgages - houses in these categories experienced a slightly smaller decrease than the national average. From 1969 to 1971, the median size of FHA-insured homes decreased 100 square feet (from 1,290 to 1,190 square feet); similarly, the median size of conventionally financed homes decreased about the same amount - 90 square feet during the same period (from 1,710 to 1,620 square feet).\*

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\* - Only VA-guaranteed homes, a small proportion of new housing stock, showed a small increase in size - 30 square feet - from 1,395 to 1,425 square feet between 1969 and 1971.

Each major region of the country also experienced decreases in the size of single-family homes during this period. The trend toward smaller homes was felt most acutely in the Northeast and West, where traditionally homes have been the largest (Exhibit 3-4). In the Northeast, the drop between 1969 and 1971 was the sharpest - down 220 square feet. In the West, 1968 rather than 1969 was the peak year in terms of size, and this region experienced a decrease of 160 square feet by 1971. From 1969 to 1971 the third and fourth largest decreases occurred in the South and North Central states, where homes are traditionally smaller: In these two regions the decreases were 135 and 70 square feet respectively. (It should be remembered that, during this period, these four areas were also experiencing increases in the median sales price per square foot; as mentioned previously, for example, the Northeast experienced both the largest price increase and the largest size decrease.)

Analyses also focused on identifying patterns for small-, moderate-, and large-sized homes. Taking the period between 1969 and 1971, smaller homes were an increasingly larger percentage of total homes, as Exhibit 3-5 shows (specifically, more homes under 1,119 square feet were being built during this period). At the same time, there was a distinct decrease in larger homes (those over 1,600 square feet), and only a slight increase in the proportion of moderate-sized homes (those in the category 1,200 to 1,599 square feet).

Finally, in urban and suburban areas, homes are larger than in the nation as a whole - and similarly - fewer small homes are built in urban areas than in the nation as a whole. Specifically, as Exhibit 3-6 shows, 14 percent of all new single-family homes in urban areas were 2,400 square feet or more, compared to 10 percent for the national average. Similarly, 32 percent of new homes in urban areas were in the next to the largest size category (1,600-2,399 square feet), compared with 27 percent for the nation as a whole.

### Number of Rooms

In the "typical" single-family home, the type of room that is most likely to vary in number is the bedroom and the bathroom, since families often attempt to economize by sharing fewer rooms. Interestingly, studies here show that although single-family homes have grown smaller, the number of bedrooms has remained the same, and the number of bathrooms has declined only slightly. Clearly, room sizes rather than the number of rooms have been cut back to achieve the smaller floorspace in homes.

Specifically, throughout the past 6 years, most homes have had three bedrooms, about a quarter have four or more bedrooms, and 13 percent, two or fewer bedrooms. Further, comparing urban and rural patterns, single-family homes in urban areas have more bedrooms than homes in rural areas. In fact, twice as many new homes in urban areas have four or more bedrooms than in rural areas (Exhibit 3-7).

While the number of bedrooms has remained constant in recent years, patterns in the number of bathrooms in new homes have changed slightly (Exhibit 3-8). As the exhibit shows, the number of homes with 2-1/2 or more bathrooms has decreased and, conversely, the number with two or fewer bathrooms increased. Overall, in isolating a national trend, it would be fair to say that fewer homes have numerous bathrooms.

In line with other construction characteristics, urban and rural analyses show different patterns, with homes in rural areas tending to have fewer bathrooms than urban homes. For example, in 1971, 42 percent of homes in rural areas had only one bathroom, compared to 20 percent in urban areas. On the other end of the spectrum, 21 percent of urban homes have 2-1/2 or more bathrooms, while only 8 percent of rural homes have as many bathrooms.

## CHANGES IN STRUCTURE CHARACTERISTICS

To identify trends in the actual structure of a typical single-family home, analyses focused on the number of stories in a home, the type of exterior construction material used, and the kind of foundation used. Aside from the recent increase in townhouse production noted in the first section, in the past 5 years, there has been little change in the type of structure produced: single-family homes are still the most common type of residential construction produced.

### Number of Stories

In terms of the number of stories, between 1966 and 1971 single-family homes maintained a stable distribution; approximately 70 percent have one story, 20 percent have two or more stories, and 10 percent are split-level types (Exhibit 3-9).

Again, areas of the country show sharp variances from the national average. For example, in 1971, approximately 84 percent of all new

single-family homes had only one story in rural areas, compared to about 65 percent in urban areas - probably reflecting the difference in land costs for these areas. Stated another way, homes with two or more stories tend to be built in urban areas. Taking regions of the country, the South and West have more single-story homes - 83 and 75 percent of all new privately owned homes.

### Exterior Materials

The type of exterior material used in the construction of single-family homes has also shown little change in the years 1969 through 1971 (Exhibit 3-10). For example, in 1971, brick was the principal exterior material used in 37 percent of the new single-family homes. In the same year, wood accounted for 29 percent; stucco 12 percent; aluminum 8 percent; and asbestos, cinderblock, cement, and stone 14 percent. In rural areas, a larger proportion of new homes are brick and wood structures.

Dramatic regional differences in exterior materials are observed. In the South, brick is used for 63 percent of homes and only 6 percent in the West. The Northeast and North Central regions show marked preferences for wood (55 percent and 42 percent respectively) and aluminum (15 percent and 23 percent respectively). Stucco, a traditional building material in the West, was the primary exterior material in 49 percent of new homes in that region.

### Foundations

Because of rising construction costs, slab foundations - the least expensive type - have become the most popular, and the more serviceable types (basements and crawl spaces) are used less frequently (Exhibit 3-11). In 1966, for example, only 28 percent of all new homes had slab foundations; but by 1971, the figure had grown to 39 percent. Full and partial basement construction suffered the greatest decline during the same period, dropping from 44 percent in 1966 to 36 percent in 1971. Crawl space foundations also declined, from 28 to 25 percent.

In rural areas, crawl spaces are the most common type, accounting for 41 percent of all new single-family homes. However, in urban areas, full and partial basements and slab foundations are the typical types, accounting for 38 percent and 46 percent of all new homes respectively. Wide variations occur in different regions of the country. In the Northeast and North Central regions, full and partial basements overwhelmingly

predominate in 82 percent and 74 percent of all new single-family homes. In the South, crawl spaces are the most typical, and in the West, slab foundations predominate.

### CHANGES IN AMENITIES

For the nation as a whole, it is hard to say whether amenities in single-family homes have increased or decreased overall, since the patterns vary. Among the amenities studied, for example, garages and fireplaces are harder to find in new homes, while central heating and air conditioning are more common than before.

#### Garages

In particular, although many homes still are built with garages for two or more cars, the percentage of single-family homes with this garage space has decreased quite sharply from 1968 to 1971, and the percentage of homes with carports or no built-in parking facilities has increased (Exhibit 3-12). As the exhibit shows, in 1968, 48 percent of new single-family homes had garages for two or more cars, but by 1971, that proportion had dropped to 41 percent. The incidence of 1-car garages remained fairly constant during this period, while homes with no built-in parking facilities increased from 19 to 23 percent, and those with carports 15 to 17 percent.

In urban areas, most new homes (67 percent) had garages for one or more cars in 1971, compared to only 44 percent in rural areas. Wide regional variances in type of parking facility can also be seen. In 1971, about 70 percent of homes in the West, Northeast, and North Central regions had garages, while only 46 percent did in the South. In addition, carports were built in 25 percent of homes in the South, 22 percent in the West, and 3 percent of North Central homes; but only in 1 percent of Northeastern homes - probably reflecting differences in climate. Of new homes with no built-in facility, the West had the lowest percentage (7 percent) and the Northeast the highest (32 percent) - a difference which does not appear to be explained by climate differences.

#### Heating and Cooling Systems

Of the various heating systems used in new single-family homes, central air heating is by far the most common, accounting for nearly

three-quarters of the production in recent years (Exhibit 3-13). Central water, electric and other heating systems have maintained fairly stable proportions of 6 percent, 12 percent, and 8 percent respectively from 1969 to 1971. In urban areas, central air heating is even more popular than in the nation as a whole; 81 percent of all homes in 1971 were constructed with such systems. In rural areas, electric and other built-in heating systems show market shares of 18 percent and 17 percent respectively. Disparate heating system preferences are also apparent among regions. For example, most new homes in the North Central and West regions had central air heating systems (i. e., 85 percent and 84 percent).

Central air conditioning has been an amenity included in more and more new homes, growing from 25 percent in 1966 to 38 percent in 1971 (Exhibit 3-14). Not surprisingly, central air conditioning was included in 42 percent of new homes in urban areas, compared to 24 percent in rural areas. Further, geographic patterns reflect climate conditions: In 1971, 52 percent of new homes in the South had central air conditioning, compared to 11 percent in the Northeast.

### Fireplaces

The construction of fireplaces, often considered a luxury, has declined somewhat during the past 3 years (Exhibit 3-15). In 1969, 39 percent of new single-family homes had one fireplace and 6 percent had two or more fireplaces. By the next year, these proportions had declined to 31 percent and 4 percent respectively. Regional differences do not seem to reflect climate conditions: Fireplaces are more common in urban than rural areas, and are most popular in the Northeast and West, with the North Central region ranking only third.

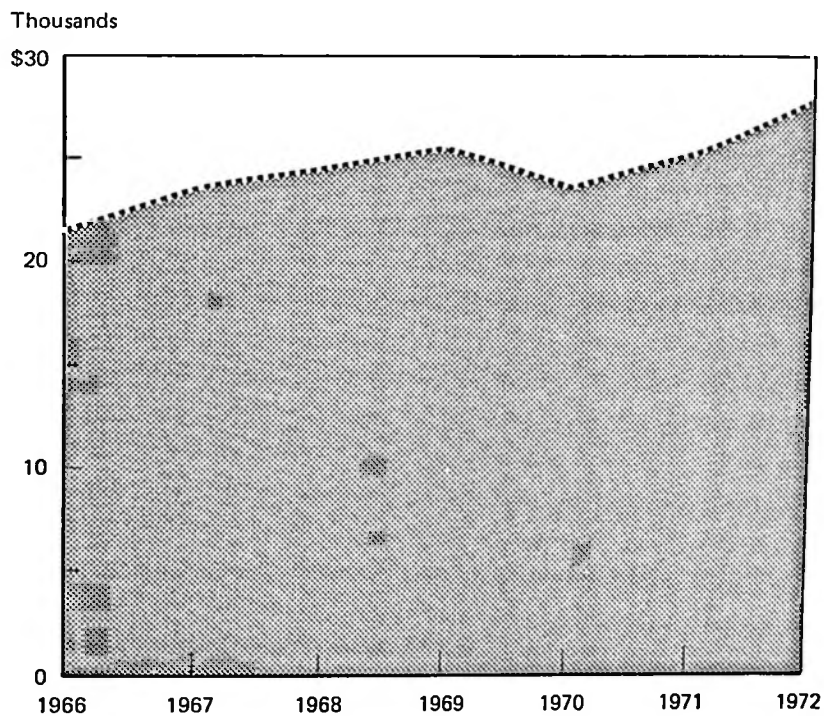
\* \* \*

In summary, recent years have seen substantial increases in the prices of new and existing homes. At the same time, the actual value of new single-family homes has decreased or at best remained the same: Specifically, decreases can be found in the size of homes (square footage), the type of foundation used, and the garage space included. Other factors - such as the number of rooms and stories - have remained constant.



THE MEDIAN SALES PRICE FOR NEW SINGLE-FAMILY HOMES HAS INCREASED MARKEDLY FROM 1966 TO 1972 . . . .

MEDIAN SALES PRICE — U.S.  
NEW ONE FAMILY HOMES SOLD



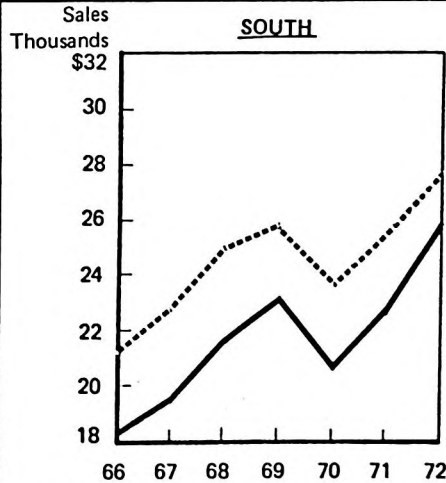
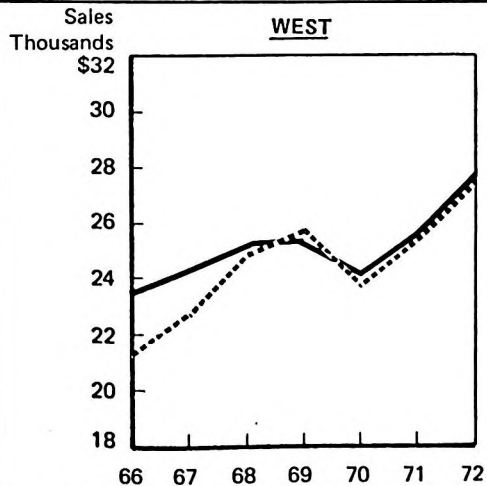
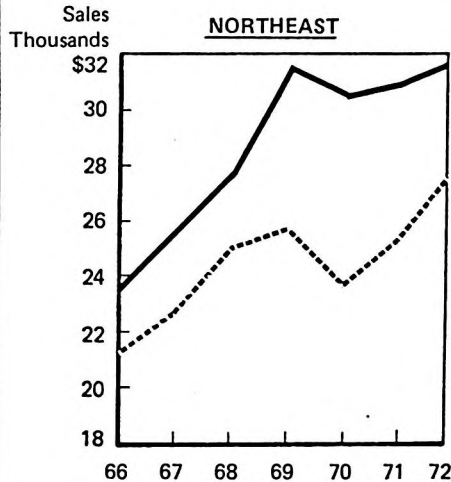
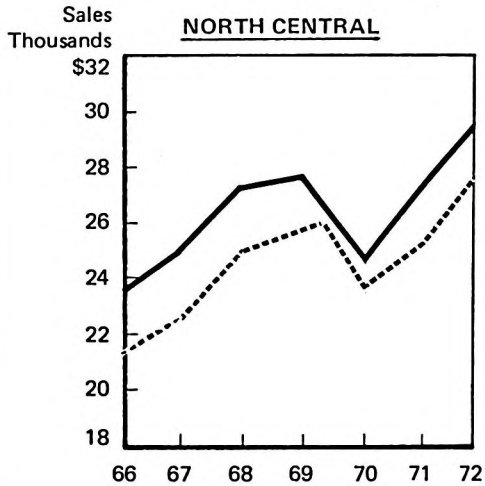
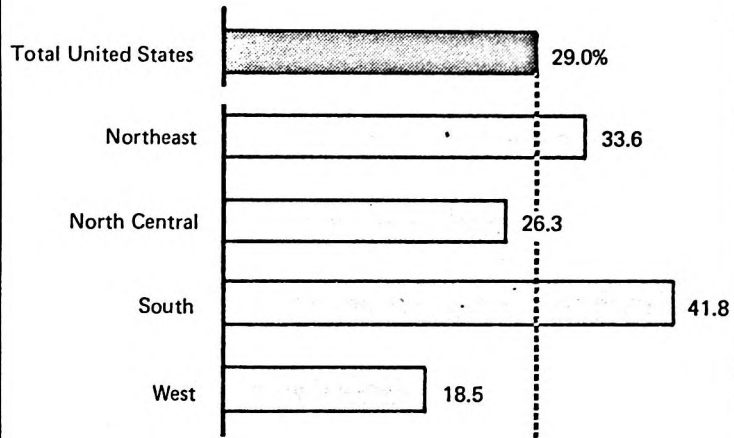
Source: U.S. Bureau of the Census, Construction Reports, Series C-25.

**SOUTH AND NORTHEAST  
REGIONS HAVE EXPERIENCED  
GREATEST PERCENTAGE  
INCREASE IN MEDIAN SALES  
PRICE . . . .**

**MEDIAN SALES PRICE  
New One Family  
Homes Sold**

..... U.S. Median Sales Price

PERCENT INCREASE 1969 - 1972

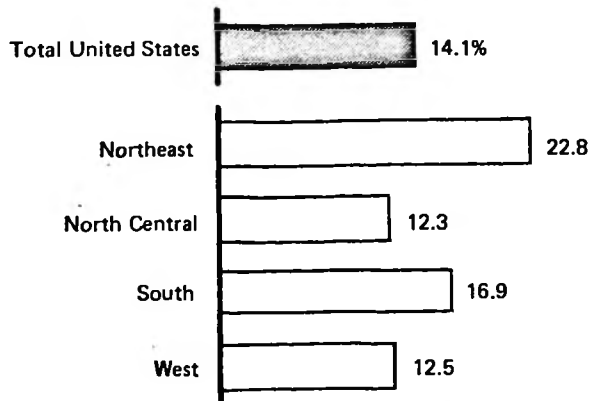


Source: U.S. Bureau of the Census, Construction Reports, Series C-25.

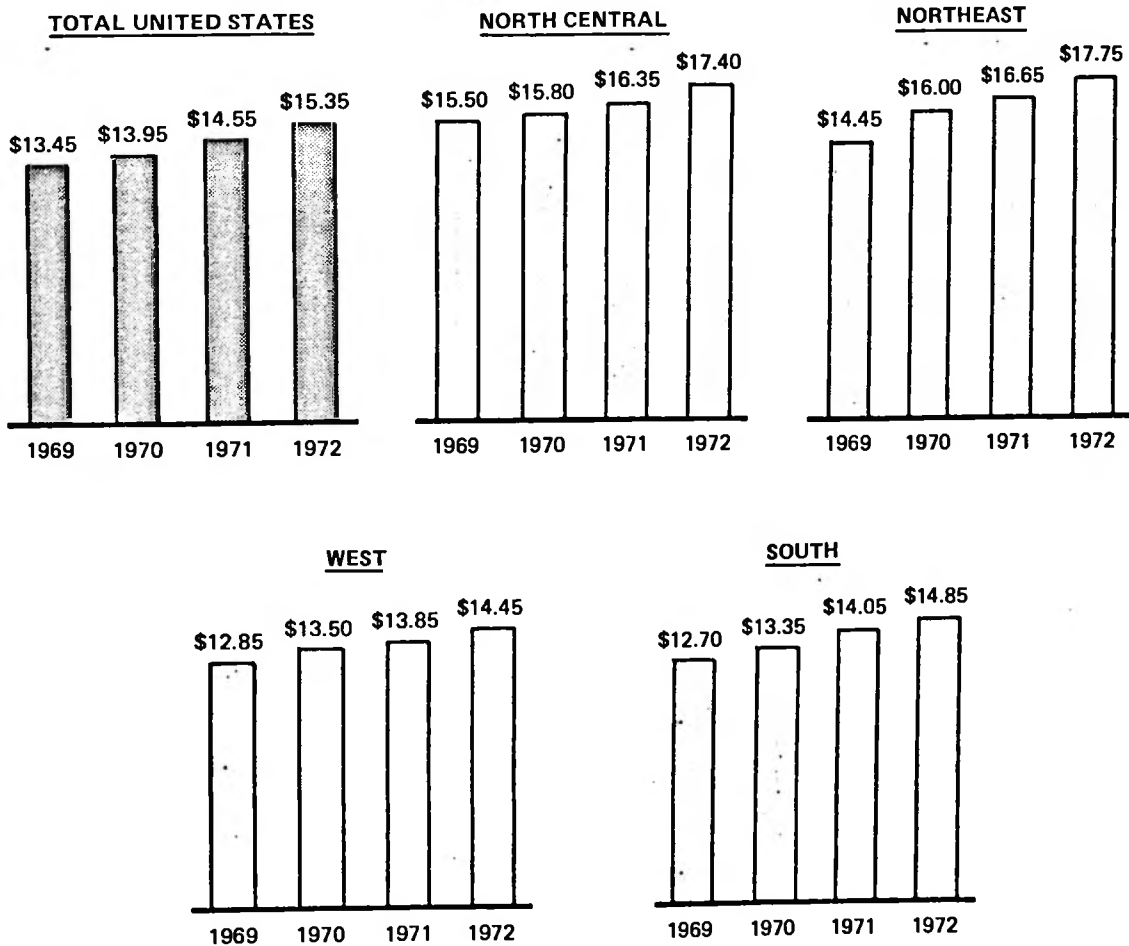
4 - ADVANCES IN HOUSING TECHNOLOGY

SIMILARLY, THE MEDIAN SALES PRICE PER SQUARE FOOT HAS ALSO INCREASED MARKEDLY, BOTH OVERALL AND IN REGIONAL AREAS . . .

PERCENT INCREASE 1969 - 1972



MEDIAN SALES PRICE PER SQUARE FOOT

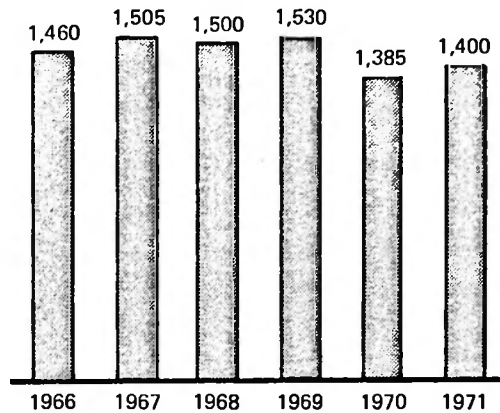


Source: U.S. Bureau of the Census, Construction Reports, Series C-25.

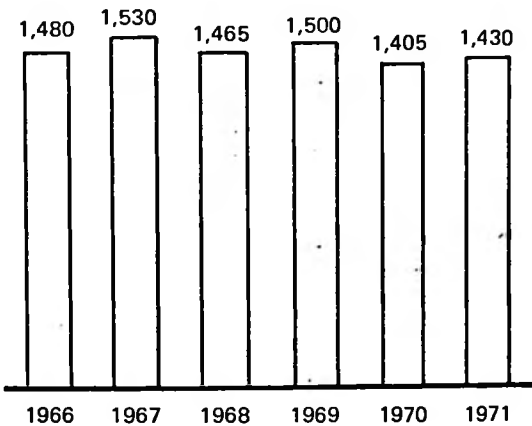
DURING THE PAST 6 YEARS, THE AVERAGE SIZE OF HOMES HAS DECREASED SLIGHTLY, AND REGIONS SHOW A SIMILAR PATTERN . . . .

PERCENT DISTRIBUTION  
 Median Square Feet  
 All New Privately Owned  
 One Family Homes

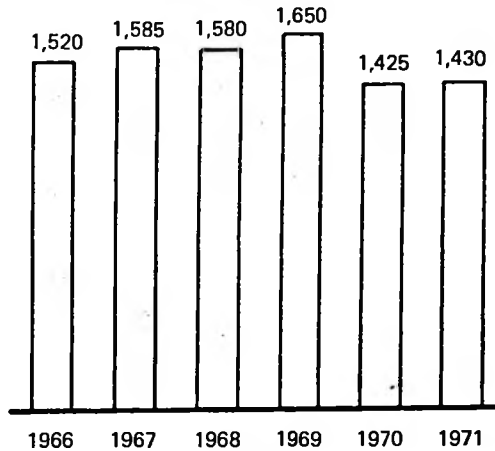
TOTAL UNITED STATES



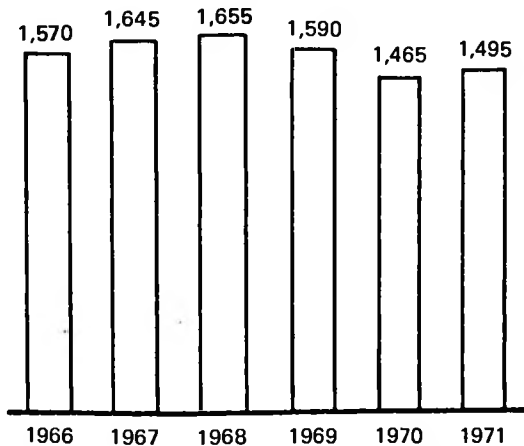
NORTH CENTRAL



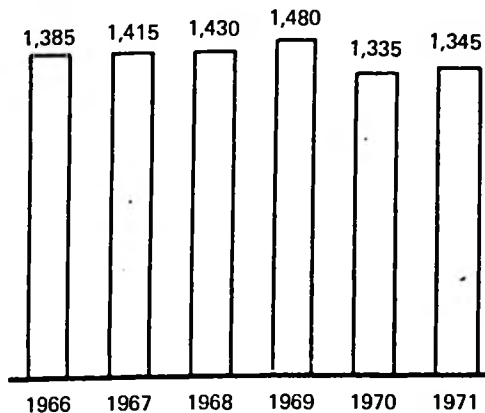
NORTHEAST



WEST



SOUTH

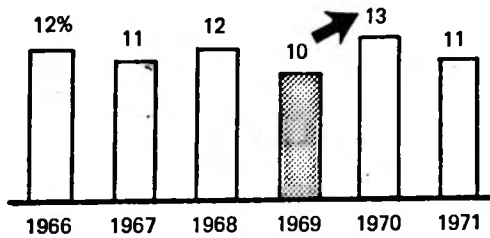


Source: U.S. Bureau of the Census, Construction Reports, Series C-25.

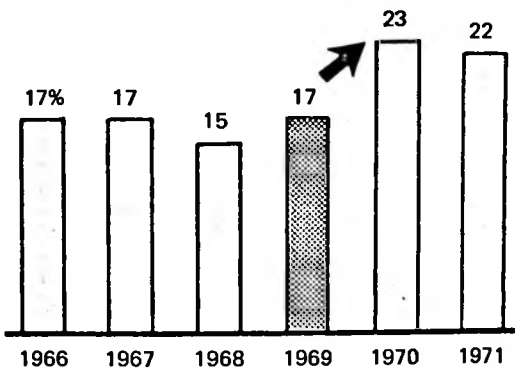
SINCE 1969, SMALLER HOMES ARE INCREASING AND LARGER HOMES DECLINING . . .

PERCENT DISTRIBUTION  
Square Feet of Floor Area  
All New Privately Owned  
One Family Homes

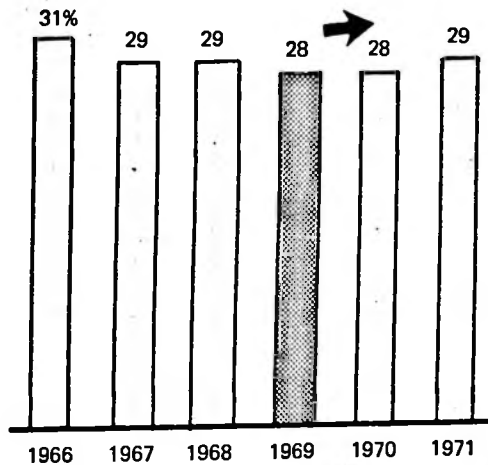
UNDER 1,000 SQUARE FEET



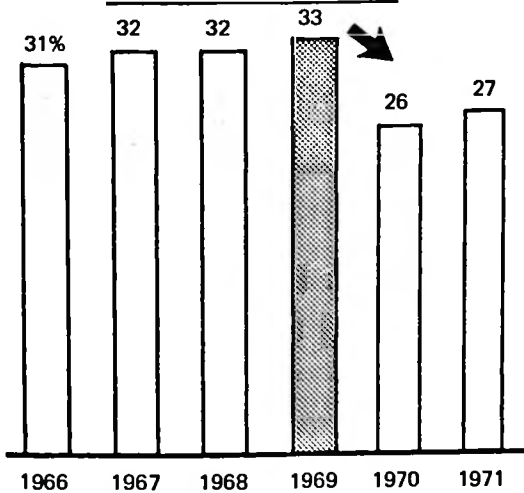
1,000 - 1,119 SQUARE FEET



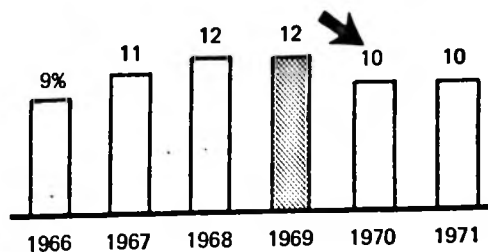
1,200 - 1,599 SQUARE FEET



1,600 - 2,399 SQUARE FEET



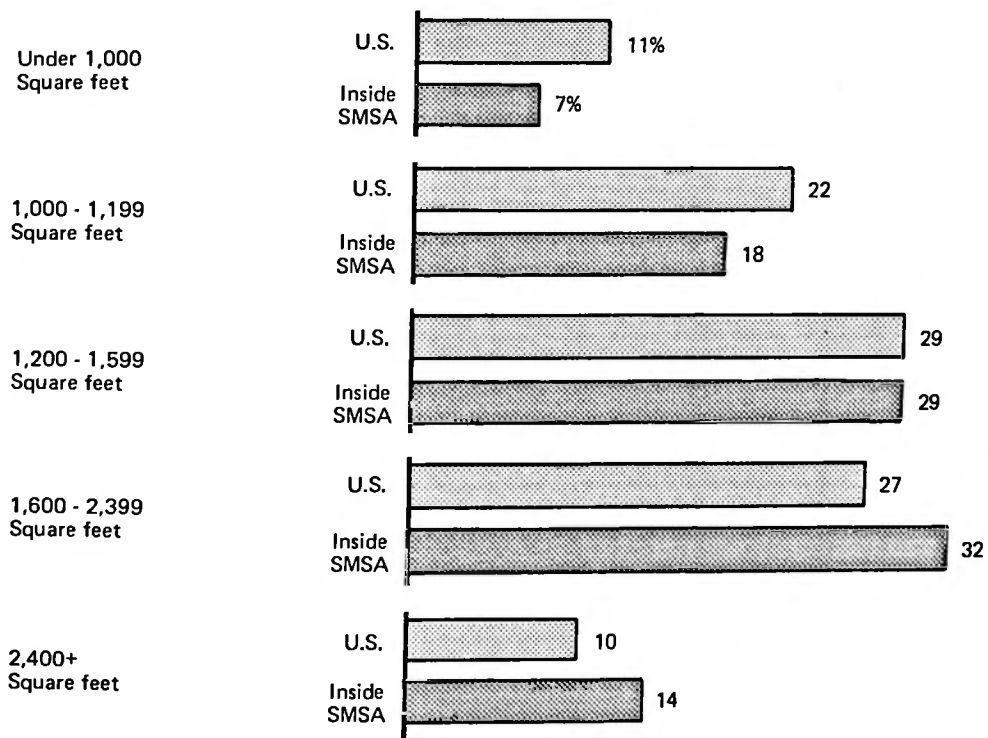
2,400+ SQUARE FEET



Source: U.S. Bureau of the Census, Construction Reports, Series C-25.

## URBAN AREAS HAVE LARGER HOMES THAN NATIONAL AVERAGE . . .

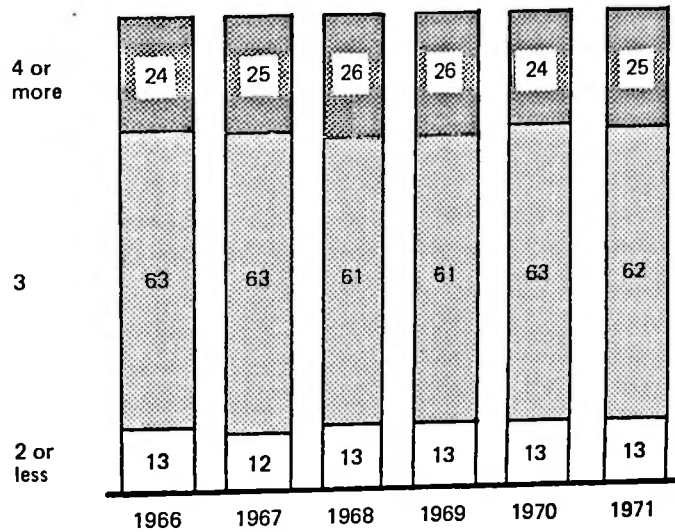
PERCENT DISTRIBUTION  
 SQUARE FEET OF FLOOR AREA  
 ALL NEW PRIVATELY OWNED ONE FAMILY HOMES - 1971



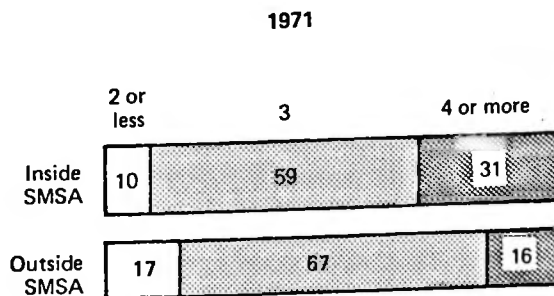
Source: U.S. Bureau of the Census, Construction Reports, Series C-25.

ALTHOUGH THE SIZE OF HOMES HAS GROWN SMALLER, THE NUMBER OF BEDROOMS HAS NOT CHANGED . . .

PERCENT DISTRIBUTION OF HOMES WITH BEDROOMS ALL NEW PRIVATELY OWNED ONE FAMILY HOMES



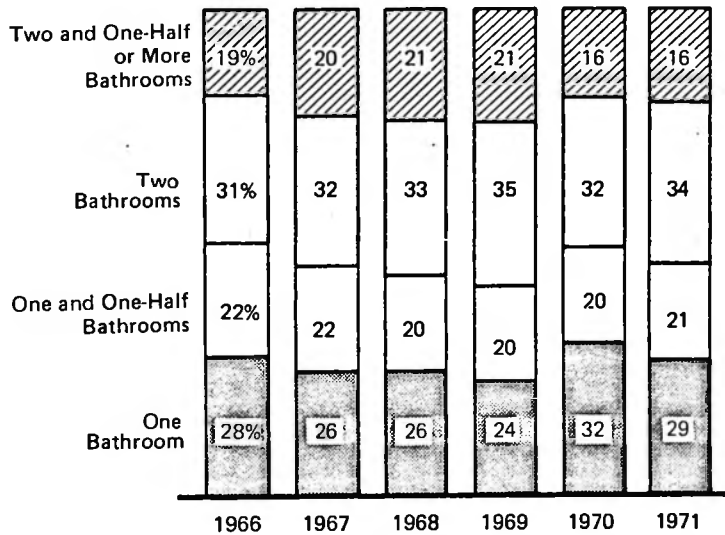
... AND URBAN HOMES ARE TWICE AS LIKELY TO HAVE FOUR OR MORE BEDROOMS . . . .



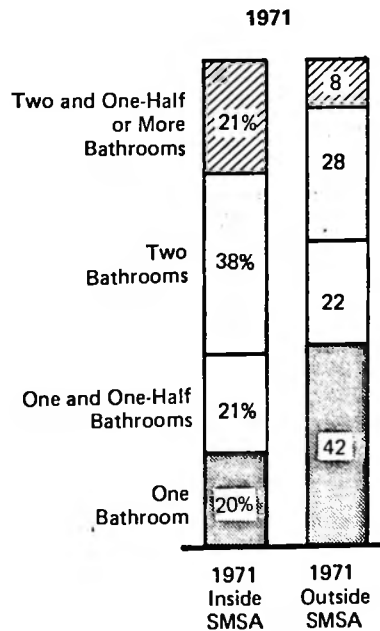
Source: U.S. Bureau of the Census, Construction Reports, Series C-25.

**HOMES WITH TWO AND ONE-HALF BATHROOMS OR MORE  
HAVE DECREASED IN PERCENT OF PRODUCTION . . .**

**PERCENT DISTRIBUTION  
NUMBER OF BATHROOMS  
ALL NEW PRIVATELY OWNED ONE FAMILY HOMES**



**. . . AND RURAL HOMES HAVE  
FEWER BATHROOMS . . . .**

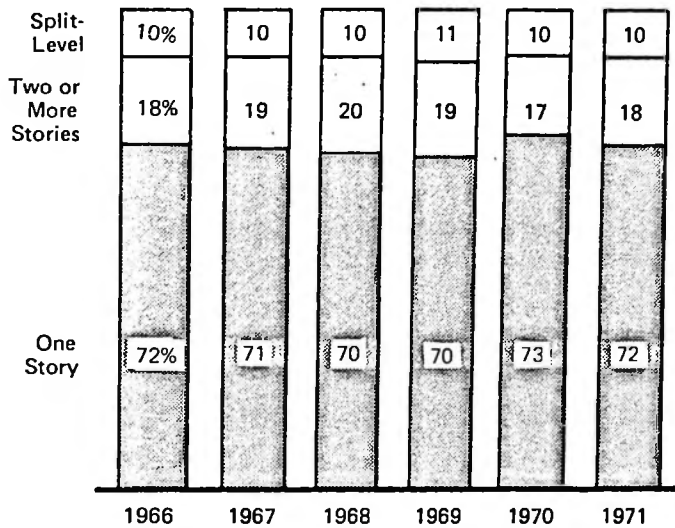


Source: U.S. Bureau of the Census, Construction Reports, Series C-25.



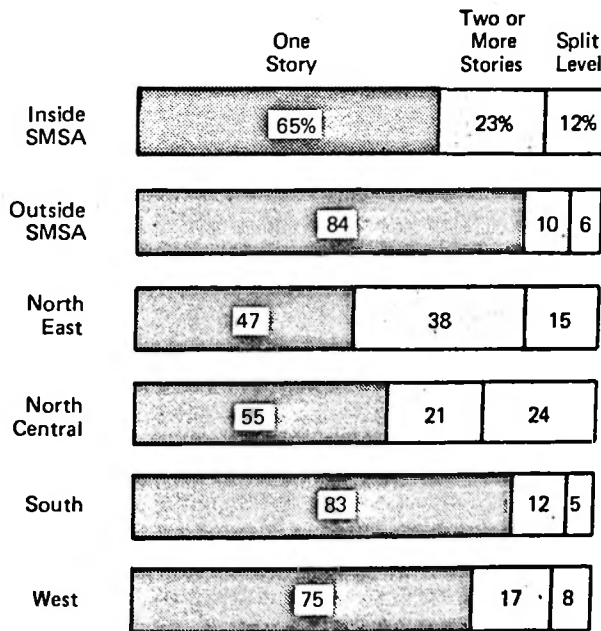
THE NUMBER OF STORIES IN SINGLE-FAMILY HOMES HAS REMAINED CONSTANT . . .

ALL NEW PRIVATELY OWNED HOMES  
PERCENT DISTRIBUTION



. . . BUT URBAN, RURAL AND REGIONAL AREAS SHOW DIFFERENT DISTRIBUTIONS . . . .

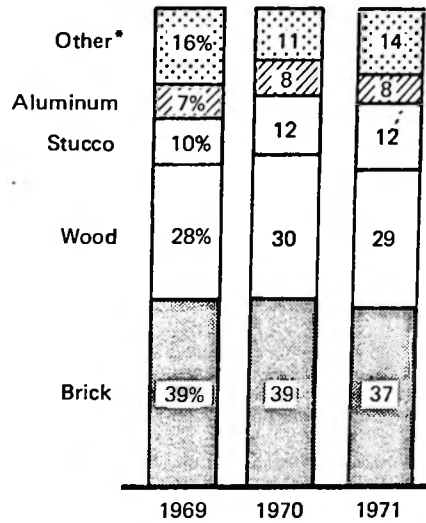
1971



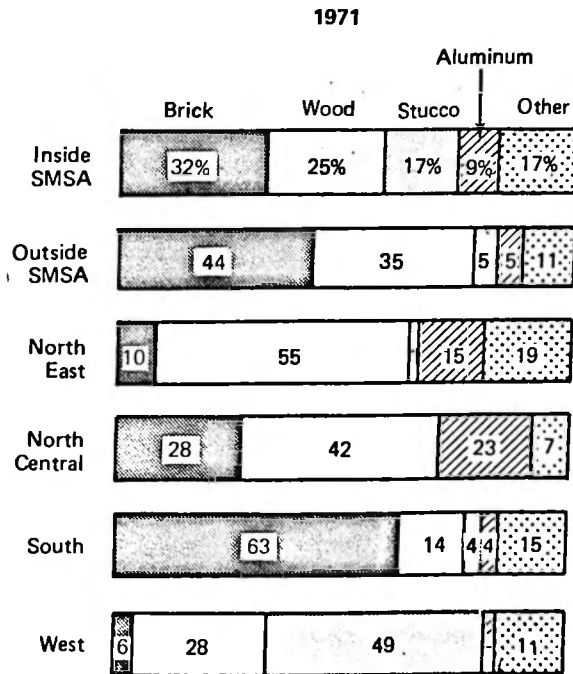
Source: U.S. Bureau of the Census, Construction Reports, Series C-25.

ONLY MODERATE CHANGE HAS OCCURRED IN TYPES OF EXTERIOR BUILDING MATERIAL IN THE LAST THREE YEARS...

ALL NEW PRIVATELY OWNED ONE FAMILY HOMES  
PERCENT DISTRIBUTION



... BUT URBAN, RURAL AND REGIONAL AREAS SHOW DIFFERENT DISTRIBUTIONS....

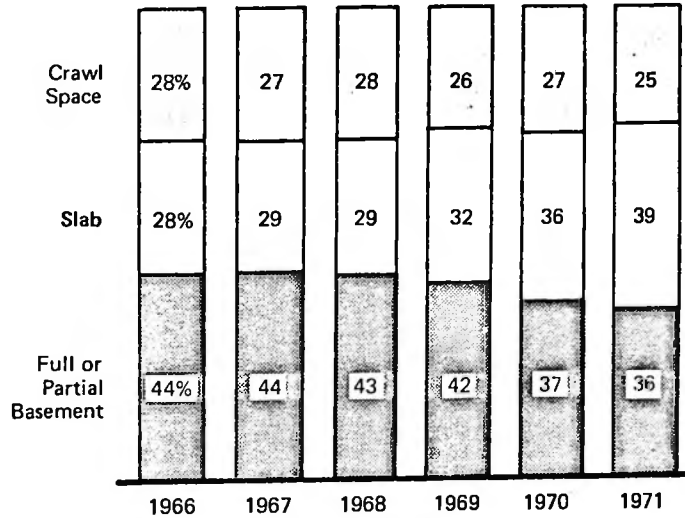


\*Asbestos, cinder block, cement block and stone.

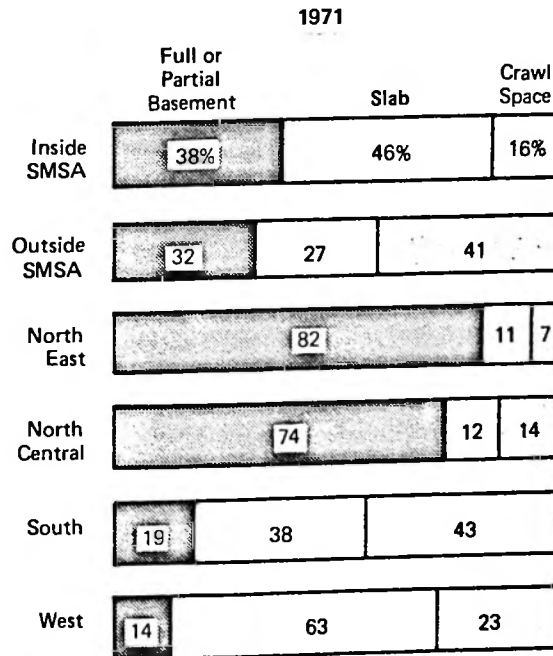
Source: U.S. Bureau of the Census, Construction Reports, Series C-25.

**SLAB FOUNDATIONS HAVE INCREASED AT THE EXPENSE OF FULL, PARTIAL AND CRAWL SPACE TYPES . . . .**

**TYPE OF FOUNDATION  
NEW PRIVATELY OWNED ONE FAMILY HOMES  
PERCENT DISTRIBUTION**



**. . . AND MARKED DIFFERENCES IN REGIONS EXIST . . . .**

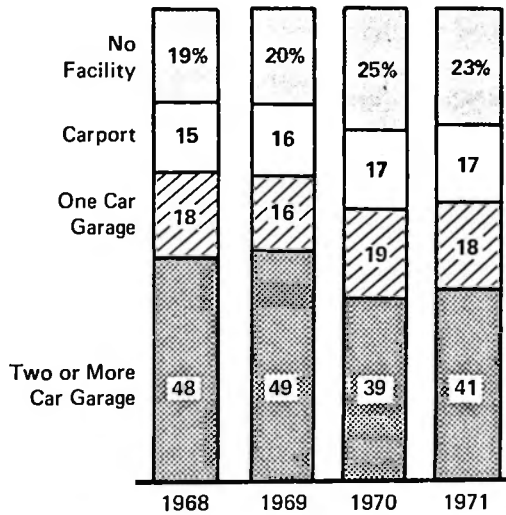


Source: U.S. Bureau of the Census, Construction Reports, Series C-25.

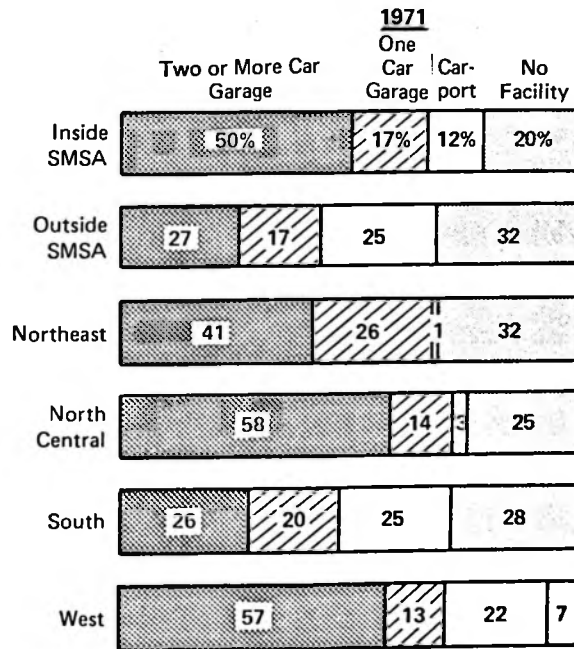
4 - ADVANCES IN HOUSING TECHNOLOGY

FEWER SINGLE-FAMILY HOMES HAVE BUILT-IN PARKING FACILITIES....

PERCENT DISTRIBUTION  
TYPE OF PARKING FACILITY  
ALL NEW PRIVATELY OWNED ONE FAMILY HOMES



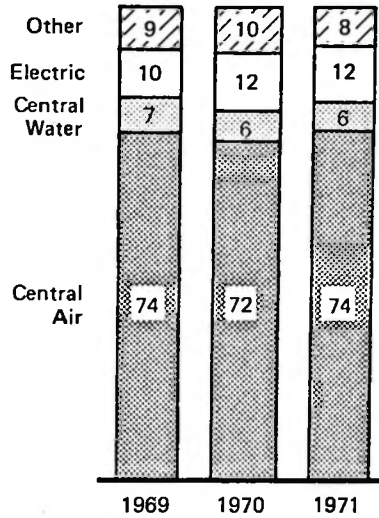
... AND PATTERNS VARY IN REGIONAL AREAS....



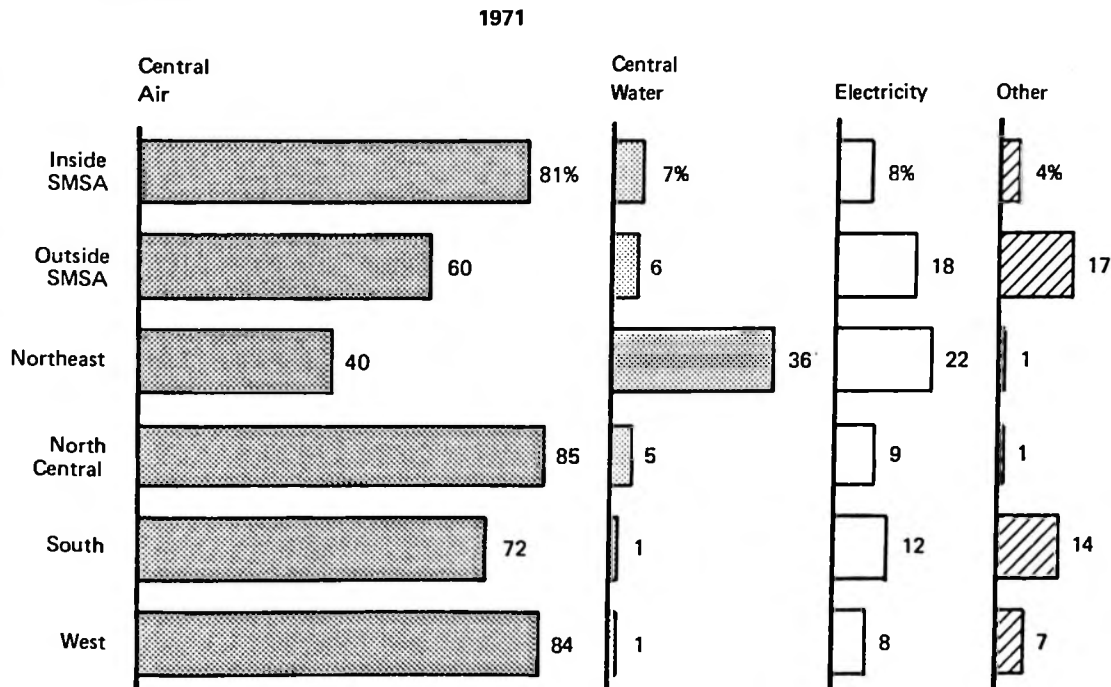
Source: U.S. Bureau of the Census, Construction Reports, Series C-25.

OF VARIOUS HEATING SYSTEMS, CENTRAL AIR HEATING  
PREDOMINATES . . .

PERCENT DISTRIBUTION  
HEATING SYSTEMS  
ALL NEW PRIVATELY OWNED ONE FAMILY HOMES



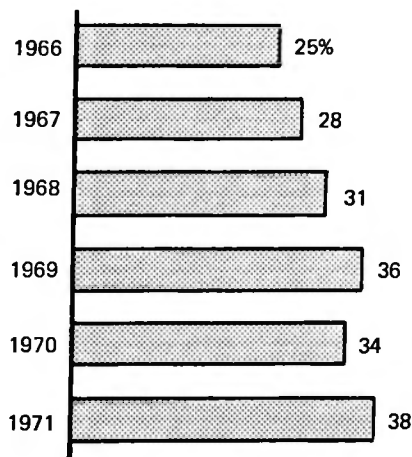
. . . BUT WIDE VARIATIONS ACROSS THE COUNTRY ARE  
REPORTED . . . .



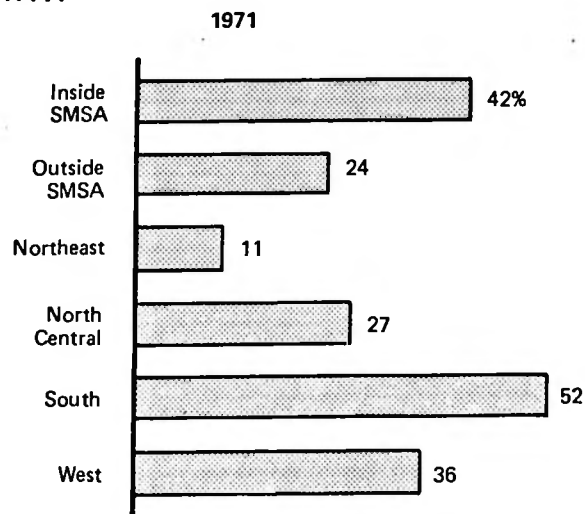
Source: U.S. Bureau of the Census, Construction Reports, Series C-25.

A GROWING PROPORTION OF NEW SINGLE-FAMILY HOMES HAVE  
CENTRAL AIR CONDITIONING . . .

PERCENT DISTRIBUTION  
CENTRAL AIR CONDITIONING  
ALL NEW PRIVATELY OWNED ONE FAMILY HOMES



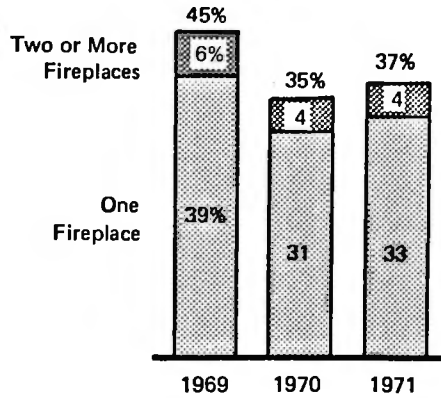
. . . WITH THE HIGHEST CONCENTRATIONS IN URBAN AREAS  
AND THE SOUTH . . .



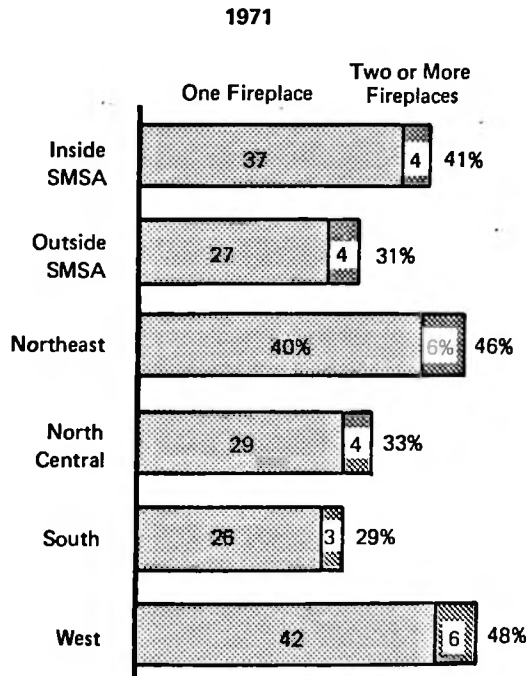
Source: U.S. Bureau of the Census, Construction Reports, Series C-25.

**FIREPLACES ARE DECLINING AS A FEATURE OF NEW SINGLE-FAMILY HOMES . . . .**

**PERCENT DISTRIBUTION  
FIREPLACES  
ALL NEW PRIVATELY OWNED SINGLE FAMILY HOMES**



**. . . BUT MAINTAIN TRADITIONAL POPULARITY IN THE NORTHEAST AND WEST . . . .**



Source: U.S. Bureau of the Census, Construction Reports, Series C-25.

#### 4 - ADVANCES IN HOUSING TECHNOLOGY

In the housing industry, production changes have been gradual - evolutionary as opposed to revolutionary - with technological advances rarely resulting in radical shifts in methodology. Most often, rapid change in housing technology is inhibited because builders cannot easily test or "prove" new ideas and because they hesitate to assume the substantial risk inherent in new products and techniques. Further, since an innovation may not survive the typical 40-year home mortgage period, financing institutions also are reluctant to encourage far-reaching changes. This is particularly true in the case of high-volume builders and manufacturers, where a single mistake can result in thousands of consumer complaints, lawsuits, and ultimate damage to profitability. Another factor behind the relatively slow growth in housing technology is the stringent and variant building codes. Lacking uniformity, these regional and local codes usually specify hundreds of different construction requirements, almost all of which are drawn up within the parameters of existing materials, equipment, and procedures.

Despite these and other constraints, there have been some significant changes in the way in which a house is built, particularly over a long period of time. Sectional and modular housing, for example, were relatively unheard of commodities prior to the sixties. And although mobile homes have been in existence for over 40 years, speed of production has increased very rapidly in recent years due to refinements in assembly line techniques. Besides production technology such as this, the housing industry has also experimented with new applications of materials - e.g., plastics, fiberglass, and resin glues.

#### PRODUCTION TECHNOLOGY

The most visible change in construction techniques and methodologies is the growing rate of industrialization to provide complete housing "packages" or major components thereof. Automation in Housing magazine, in its 1973 Factbook, predicts that 70 percent of all housing starts in 1973 will involve the use of at least some industrialized components. This level of usage represents an increase from 48 percent in 1969. If mobile homes are included, the increase will be from 59 percent in 1969 to over 76 percent this year.



Some industry observers believe that the level of industrialization in housing production is, in fact, substantially higher. Considering that such factory-made parts as kitchen cabinets and prehung doors are used so commonly, it has been estimated that over 90 percent of all starts were made using some "manufactured" component. Whatever the precise figure, it is clear that this level of industrialization in housing has been increasing - most recently in application of the following components:

- ¶ Trusses and panels for floors, ceilings and walls now comprise the largest volume in industrialized housing. A recent study by Automation in Housing magazine, conducted in the 10 largest cities in the United States, showed that over 80 percent of the builders in these markets were using this type of prefabricated item.
- ¶ Mechanical cores are perhaps the most revolutionary innovation in the homebuilding industry in recent years. These units usually contain an entire kitchen and one or more bathrooms, complete with all fixtures, plumbing, installation, and electrical wiring. Although the core is not really new - it has been used by one major home manufacturer for the last 10 years - it is starting to gain wider acceptance. Used in an insignificant portion of total housing starts, these combination cores are estimated to have been placed in 15,000 to 20,000 units.
- ¶ Individual plumbing and electrical cores are in the same family as kitchen/bathroom cores. These components provide all the plumbing or wiring necessary for the structure in one package. While accurate figures are not known, the volume of these units is also expected to increase.

Most of the housing starts incorporating manufactured components are still made largely by conventional on-site builders, some of whom have integrated backward to provide this capability. One of the top 10 homebuilders reports that it intends to manufacture components for about 40 percent of its units. The number of starts made by this and other conventional on-site builders using such components has, according to Automation in Housing, increased from about 230,000 units in 1969 to almost 500,000 units in 1972.

Although conventional builders are still the primary users of factory-made components, an emerging force in this field is the housing manufacturer, who fabricates complete or nearly complete housing packages, ships them to the site, and assembles the house. The three most prominent kinds of housing packages are:

1. Panelized housing - a completely prefabricated housing unit that has been "knocked down" and shipped to the site, where it is assembled. These units closely resemble conventionally built homes, with the advantage of substantial labor and time savings. Moreover, on-site pilferage of lumber and other construction materials is vastly reduced: A panelized house can be assembled on site and locked up in 1 day.
2. Sectional housing - 3-dimensional factory-built houses that are vertically cut in half at the factory and rejoined on site. These homes are quite similar to the double-wide mobile homes, which are usually two units joined on site; however, they tend to be considerably more costly than mobile homes.
3. Modular housing - a house that is built by assembling 3-dimensional "building blocks." These blocks, each of which is usually one room, are assembled on site.

Despite some well-publicized failures and plant closings, the manufactured housing industry has been increasing its production capacity by 20 to 25 percent a year over the last 10 years. Since 1960, the manufactured housing units shipped increased at an 11.0 percent compound annual rate - from 126,800 units to about 440,000 units in 1972 (Exhibit 4-1).

In addition to these somewhat "visible" changes in housing production, there are many changes in the manner in which a house is constructed that are totally unnoticeable to anyone not closely associated with homebuilding. Often the changes are small and have little positive or negative impact on the soundness of the structure, but do allow some savings in time and/or money. An example of this type of change is attaching steel beams to wood sills with steel bands instead of using conventional fasteners and screws. Another new technique is applying adhesives to attach sheathing to studs to reduce the number of the nailings necessary. However, as indicated earlier, the use of such methods has been limited to an extent by building codes and, in some cases, a lack of awareness of the new techniques.

### PRODUCTION AIDS

As the homebuilding industry advances in construction techniques, new aids and tools have been developed to assist the builder. The most significant are those used in actual construction and those devised for better managing the homebuilding or manufacturing operation.

## Building Tools

The most commonly used construction aids that have been developed in the past few years are:

1. Automatic gun-nailers. The automatic gun-nailer, capable of nailing one nail at a time, has been used for on-site building for quite some time. However, the increase in factory manufacturing of houses and house components has led to the development of new guns that are capable of multiple, simultaneous nailing.
2. Panel cranes. As a result of the increased use of panels for the floors, walls, and ceilings, panel cranes attached to the transport truck have been developed to lift and place these panels in their proper position at the building site - a substantial saving in labor and time.
3. Truss assembly forms, framing tables, sheathing machines. As may be self-evident, these items facilitate the assembly of major components of the house.
4. Adhesives and adhesive guns. Resin epoxies developed in space technology have been increasingly applied to the housing construction industry as a joining element. A logical corollary of the new adhesives is the adhesive gun, which dispenses ribbons of adhesive from metal containers. One constraint in the application of such adhesives, however, is lack of controlled climatic conditions that are necessary for the adhesive to set correctly.

## Management Tools

Computers are still rare in homebuilding, but they have been appearing in recent years - at least with the large home manufacturers. There are, thus far, two primary applications for computers in housing:

1. Engineering construction designs. At least two large component manufacturers are known to use computers to identify the kind of lumber, roof pitch, spans, and snowloading capacity required for trusses in various types of houses. The key benefits of such a method are not only savings in time, but a reduction of material wastage through mistakes or miscalculations.

2. Scheduling the flow of materials and parts. Another use of the computer is to schedule the cutting of parts and other tasks so that all the components of a particular unit are ready to be shipped out at the same time.

As the sophistication of the homebuilding industry grows, the application of computers in production scheduling and purchasing is likely to increase in the larger homebuilding companies.

## MATERIALS TECHNOLOGY

The basic materials used for the construction of a residential dwelling are wood, concrete, brick, stone, plastic, steel, aluminum, and glass. It is not the basic materials that have changed so much over time as it is their frequency of use and method of application in the construction of a house:

1. Wood. Although there have not been major changes in the application of wood in homebuilding, it is used much less frequently because of the high cost of lumber. Hardwood floors, for example, have almost become a thing of the past. Doors and window frames are in many cases metal or plastic, and wood as an exterior siding is often used more to accent the structure rather than as the basic material.
2. Concrete. Prestressed and precast concrete is being used more extensively for walls, floors and ceilings - in part as a result of increased lumber prices. In some cases, carpeting is being applied directly to the concrete foundation slab.
3. Plastic. There has been a significant increase in the use of plastic in all aspects of home construction. One Operation Breakthrough house, for example, was built with plastic exterior walls. And at least one major builder has indicated that 40 percent of the structures that the company will build next year will have fiberglass exteriors. Complete plastic bathroom assemblies have also been developed, and plastic is being used as the basic material for cabinets, insulation and, in combination with asphalt, in roofing shingles. Although not extensive at this time, the use of vinyl as an exterior siding is increasing. Perhaps the biggest gain in the use of plastic has been in the plumbing area. Although the durability of plastic pipe has not been fully tested, its resistance to freezing in cold climates may give it a great advantage over cast-iron piping. Moreover, plastic

pipe is far less expensive than cast iron - e. g. , as low as \$29.50 per 100 feet of 3-inch service pipe compared to \$118.00 for cast iron.

4. Steel. Although traditionally used very extensively in heavy construction, steel in residential construction had been fairly limited until recently. However, it is now being used in homes for roof trusses, floor joists, studs, and hollow metal doors - again in part as a response to high lumber costs.
5. Aluminum. Lightweight aluminum has been used to provide the entire frame for some 5,000 of the homes now built. One aluminum company predicts that the aluminum frame will be used in at least 10 percent of the new houses built by 1980. While competitive in cost with lumber, it is yet to be proved that the aluminum frame is, in fact, more economical in the long run. Additionally, there is also the drawback that fire will melt aluminum more quickly than it will burn through the new laminated woods that have been developed. Aluminum is also being used more indoors and, more extensively, as a siding material.
6. Glass is still being employed in the traditional manner in the construction of the home, but there have been some new glasses developed that are being used to provide greater insulation to the home than the traditional flat glass. Both float glass and mirror-like reflecting glass are being used to cut down on the heat and air conditioning needed in houses.

#### OUTLOOK FOR THE FUTURE

As has been shown, technological advances in homebuilding have been occurring somewhat slowly and primarily in the direction of providing a fully manufactured housing package. The outlook for the future, as indicated by general industry consensus, is that the new products, techniques, and materials applications not only produce time and cost savings but may even be of superior quality and within closer tolerances. Moreover, the typical homebuyer cannot often tell the difference between a factory-made house and one that has been built from the foundation up in the traditional manner.

Perhaps most important in the future of housing technology is the availability of product testing, such as has been done in Operation Breakthrough projects. Several private concerns, such as the National Association of Home Builders and the American Plywood Association, operate research centers funded for this purpose. Most of the major homebuilders also have their own engineering capability and, in some cases, research divisions; at least one major builder has testing facilities that are not only used for their own products, but for those of other builders as well. But the number of such facilities is still very limited compared to other industries.

An experimental project recently taken on by a major homebuilder in conjunction with at least 10 other corporations is another sign of progress for the industry. This group of builders constructed and sold a "laboratory" house in Columbia, Maryland, equipping it with a number of innovations that the owners of this house allow to be inspected periodically. Some of the more interesting experiments are: a prebuilt modular bath/shower component made of seamless fiberglass; solid vinyl siding and "shingle" roofing, which are 8-foot panels of asbestos that resemble wood shingles; and exterior paneling made of extruded polystyrene board to be used as a substitute for sheathing and insulation. However, since their experiment began only this year, results from this and other such testing will be slow in coming.

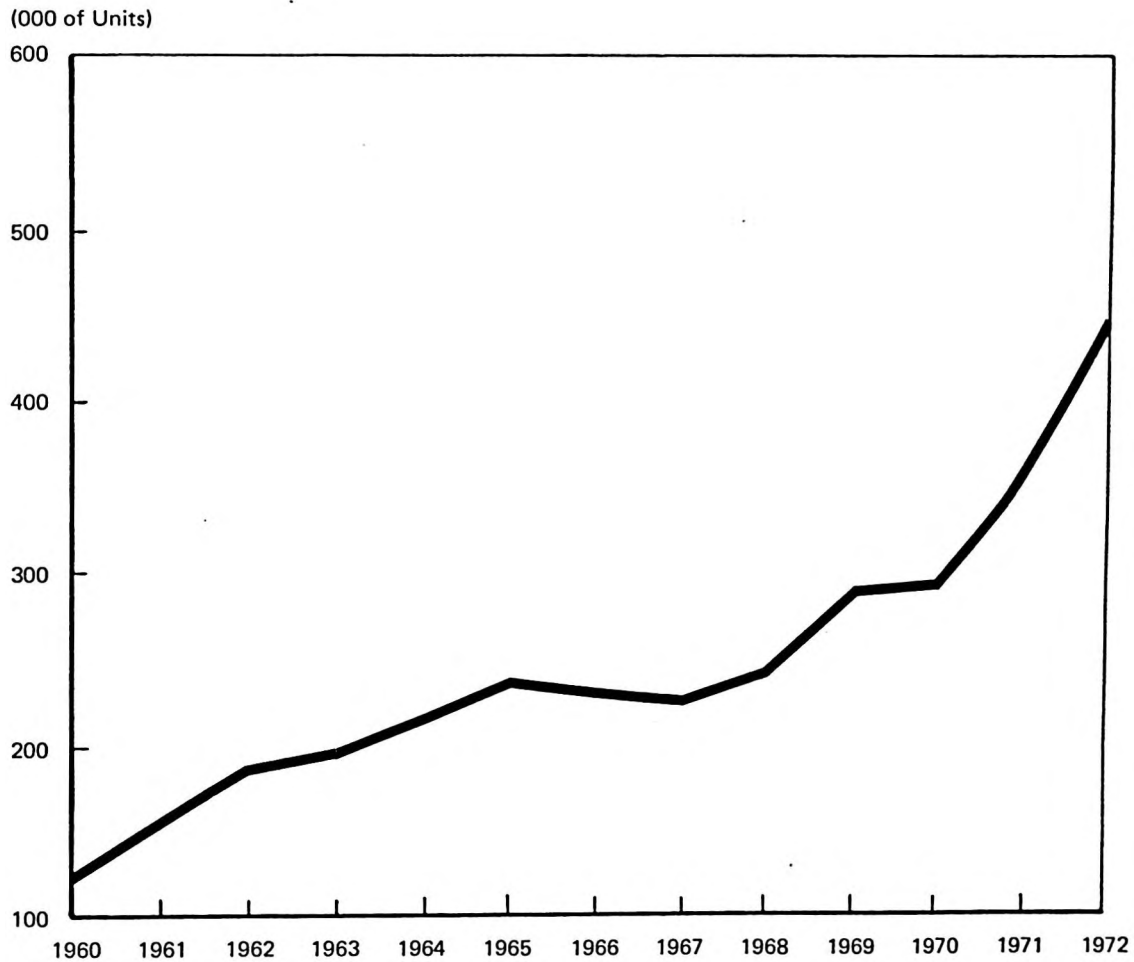
The most often mentioned obstacle in the way of advances in housing technology is building codes. While nationalized building codes have been forwarded as an improvement to the present state code system, many feel that unless several common codes were developed, regional cost and climatical conditions would not be adequately recognized. Since 1969, however, considerable progress has been made in bringing about uniformity in building codes, primarily through the states. Since that time, 28 states have adopted enabling legislation to create statewide industrialized housing laws. In essence, these laws allow housing units produced in state-inspected or state-certified factories to be placed anywhere within that state. These laws now encompass more than two-thirds of the nation's building activity. Yet, because most of the legislation is relatively new and still to be implemented, its full impact has not been felt throughout the industry.

\* \* \*

In sum, the trend has been toward increasing use of technology and other improvements in industrialized techniques in housing production and manufacturing - and this trend will undoubtedly continue. But how rapidly the industry advances in this direction will depend on the availability of funds - public or private - to support the testing of new modes of construction and, further, on the speed at which innovations can be brought on stream and approved by governmental authorities.

MANUFACTURED HOUSING SHIPMENTS HAVE GROWN QUITE STEADILY  
IN RECENT YEARS . . . .

MANUFACTURED UNITS SHIPPED\*



\* Counts only complete home packages and modular type units that conform to local building codes and are eligible for long-term financing.

Source: National Association of Building Manufacturers.



**DEPARTMENT OF HOUSING  
AND URBAN DEVELOPMENT**

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