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Volume Author/Editor: David M. Blank

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Chapter Author: David M. Blank

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2. THE BEHAVIOR OF RESIDENTIAL CONSTRUCTION 1889-1950

IN THIS analysis of trends in the level, cyclical behavior, and composition of the several measures of residential building over a sixty-year period,[1] attention is devoted to the number and structure-type of dwelling units started, and to expenditures for housekeeping and nonhousekeeping residential facilities.

Number of New Housekeeping Dwelling Units Started

The number of new housekeeping dwelling units started annually has undergone a series of long cyclical swings over the last six decades. The determination of the number of long cycles depends on how the decline in building during World War II and the subsequent rise are treated. If this movement is considered not a true building cycle but rather a suppressed portion of the long expansion following the depression and resulting from wartime restrictions on construction, then three long cycles in the number of dwelling units started have been traced out over the past sixty years (Chart A). Alternatively, if the war cycle is accepted as a genuine long cycle, four cycles are indicated (see also Appendix A, Table 16).

From a peak in 1892, the number of dwelling units started fell to a trough in 1900, rose to a peak in 1905, declined to a low point in 1918, rose to a peak in 1925, declined again through 1933, and reached a tentative terminal peak in 1950.[2] The long rise from 1933 to 1950 was interrupted by a decline

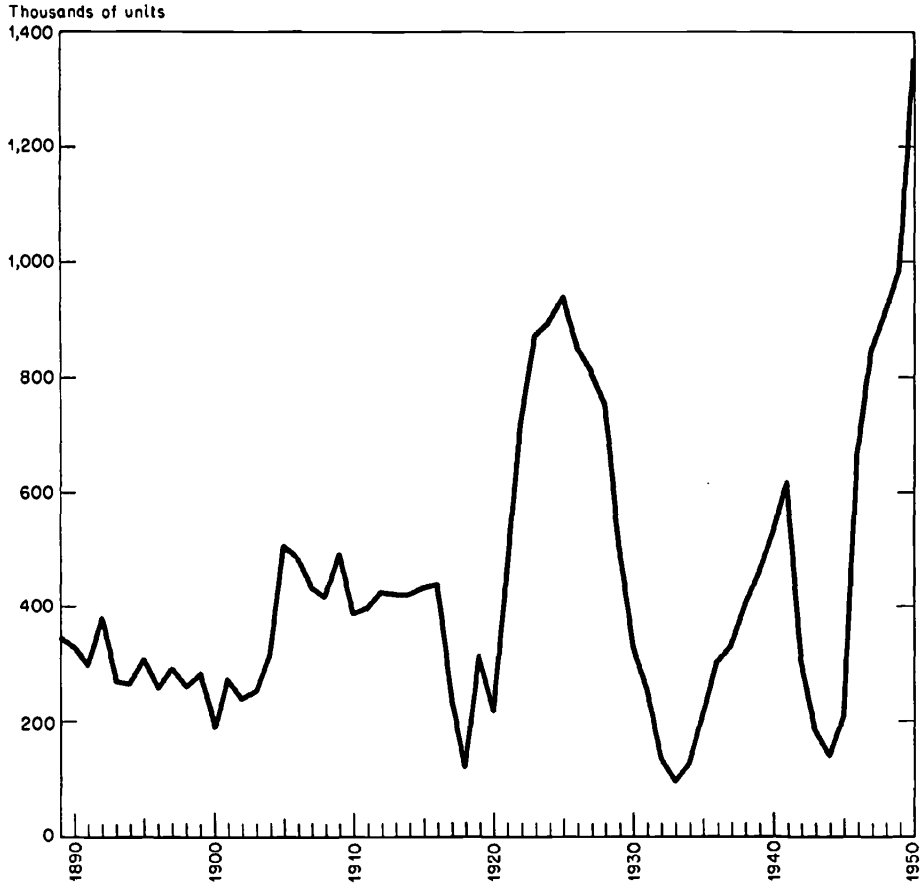
[1] For all except the nonhousekeeping series, the data through 1920 are new estimates prepared for this study; the post-1920 data are the official joint estimates of the Bureau of Labor Statistics and the Department of Commerce. The residential nonhousekeeping series through 1914 are new estimates, and the post-1914 data are the joint estimates of BLS and the Department of Commerce.

[2] The long swings in all the series on nonfarm housekeeping residential building were quite apparent in the data. The turning point dates were chosen simply as the year of highest building activity in each peak period and the year of lowest activity in each trough period. The differences between the turning points in the several series are indicated in Table 2. The initial peak in each series was determined by extrapolating each series by the relevant chain index derived from the sample building permit data discussed in Section 5 and by again selecting the highest year in the peak period around 1890. For a fuller discussion, see Section 5. The choice of 1950 as a tentative terminal peak for all series was based on two considerations: First, the number of dwelling unit starts in 1951 and 1952 was about a quarter below the 1950 high. Second, it seems unlikely that the 1950 high will be reached again in the near future. This view is based largely on the declining number of young people who will reach marriageable age during the next half-decade, and the resulting effect on family formation, as well as the great decrease in the per cent of doubled-up families since the end of World War II.

Colean and Newcomb argue that there have been no long cycles in total *construction*, except those resulting from or following the Civil War and World War I. They do not claim, however, that there have been no long cycles in residential building. Indeed, it is only when they lower the weight of residential building in existing series that they derive an index of total construction volume apparently unmarked by long cyclical swings from 1878 to 1914. (Miles L. Colean and Robinson Newcomb, *Stabilizing Construction: The Record and Potential* [McGraw-Hill, 1952], Appendix N). For a discussion of long cycles in total *building* activity, see Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles* (National Bureau of Economic Research, 1946), pp. 418-20.

Chart A

NEW PRIVATE PERMANENT NONFARM HOUSEKEEPING DWELLING UNITS STARTED, 1889-1950



Source: Table 16, Appendix A.

from 1941 to 1944.[3]

As would be expected from the dates of turning points, decade averages show an irregular pattern (Table 1). Variations during the first three decades were minor, ranging from an annual average of 294,000 dwelling units in 1890-99 to 361,000 in the following decade. The 1920-29 average not only was about twice the average of any one of the preceding three decades, but

[3] The turning points of dwelling unit starts, together with those of the expenditure series, are shown in Table 2. Clarence Long, on the basis of a much smaller sample of cities, computed an index of the "number of families accommodated," i.e. dwelling units authorized, which shows turning point dates roughly approximating those indicated in the text. The turning points in his series for comparable periods were 1892, 1902, 1906, 1918, 1927, and 1933. Clarence D. Long, Jr., *Building Cycles and the Theory of Investment* (Princeton University Press, 1940), p. 133.

Because of the special type of index used by Long and the disproportionate weight of "multi-family dwellings" in New York City in his index, his results are not fully comparable with either the aggregate estimates or the chain index prepared for this study.

The turning points in the number of detached dwellings constructed in the cities in Long's sample, derived by Long as the median turning point dates of the various cities, conform even more closely to the turning points in the number of private nonfarm dwelling units started, indicated in this study. The turning points in Long's series were 1891, 1900, 1909, 1918, 1924, and 1934. (*Ibid.*, p. 135).

Table 1

ANNUAL AVERAGE NUMBER OF NEW PRIVATE PERMANENT NONFARM HOUSEKEEPING DWELLING UNITS STARTED, BY DECADES AND WITHIN LONG CYCLES, 1890-1950, AND AMPLITUDE OF LONG CYCLES, 1892-1950

DATA BY DECADES		DATA BY LONG CYCLES		
Decade	*Annual Average Number* (000)	*Period*	*Annual Average Number* [b] (000)	*Amplitude, Per Cent Rise & Fall* [c]
1890-1899	294	1892-1905	281	181.4
1900-1909	361	1905-1925	464	260.4
1910-1919	359	1925-1950	484	434.5
1920-1929	700			
1930-1939	265	1925-1941	430	318.9
1940-1950 [a]	613	1941-1950	581	291.6

[a] Eleven-year average.

[b] Terminal years weighted one-half.

[c] For manner of deriving amplitude, see text, note 4, below.

Source: Table 16, Appendix A.

also was significantly higher than the average of either of the two decades following. The lowest average number of starts of any of the six decades was in the 1930-39 period.

Five-year averages show a slightly different result, as far as a comparison of the 1920's and 1940's is concerned. The period 1925-29, with an annual average number of dwelling units started of 772,000, was surpassed by the 1946-50 period in which starts averaged 953,000 units. The difference between the decade and the five-year averages is explained by the fact that the first half of the 1920's had a high annual average (629,000), while the early forties showed a relatively low annual average (355,000 for 1940-44 and 290,000 for 1941-45).

Long-term movements can be more accurately defined by the use of long-cycle averages (Table 1). The 1905-25 cycle, measured peak to peak, registered an annual number of dwelling unit starts about two-thirds higher than the preceding cycle. The 1925-50 cycle average was barely 4 per cent higher than the 1905-25 cycle average, despite the fact that the former included the two half-decades with the greatest number of starts of the entire sixty-year period. This relationship was partly a result of the very low levels of residential building in the first half of the 1930's, during the great depression, and in the first half of the 1940's, a period of war restrictions.

If the 1925-50 period is treated as two cycles, the 1925-41 cycle is characterized by an average annual number of dwelling unit starts about 7 per cent below the average of the preceding cycle. But the 1941-50 cycle average is about one-fourth higher than the 1905-25 cycle and slightly more than one-third higher than the 1925-41 period.

A more persistent long-run movement has been the increasing relative amplitude of the long cycles in dwelling unit starts. The cycle amplitude increased by more than 40 per cent between the first and second cycle and

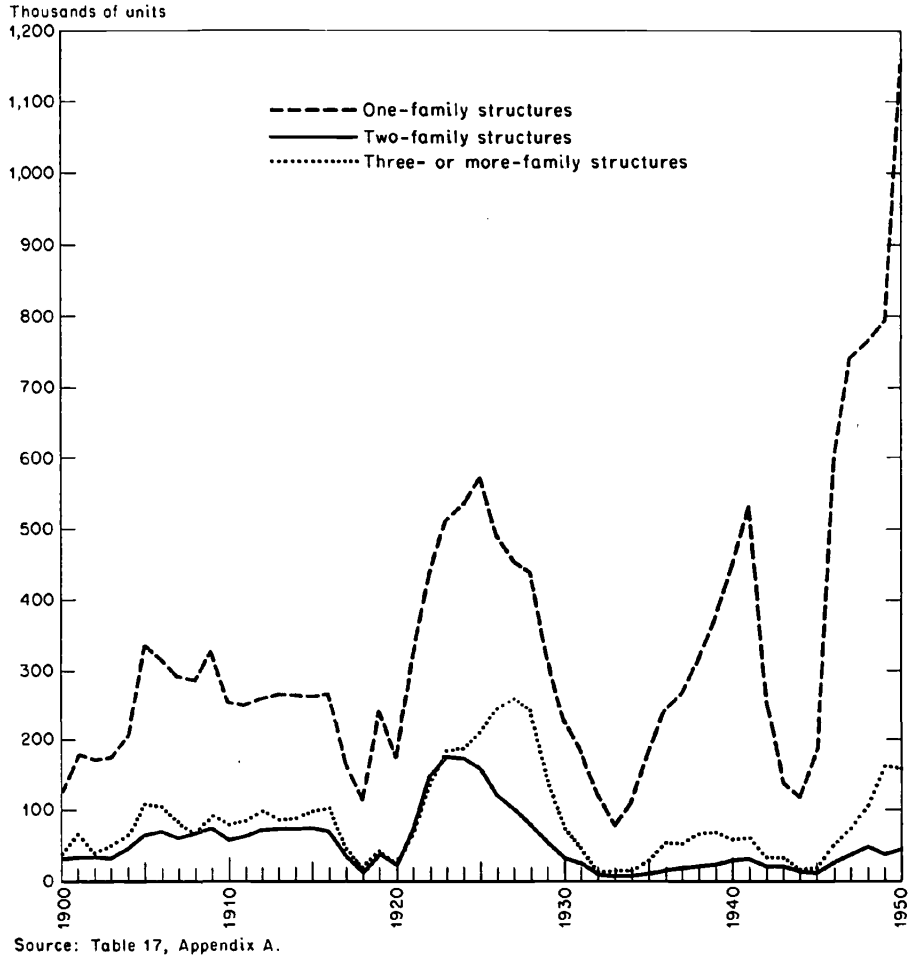
by about two-thirds between the second and third cycles (Table 1).[4] If the 1925-50 cycle is broken into two cycles, the increase appears somewhat less marked, with the 1941-50 cycle amplitude almost 10 per cent below that of the 1925-41 cycle. But both amplitudes were higher than that for the 1905-25 cycle (22 and 11 per cent, respectively). This long-run increase in cycle amplitudes is even more marked in the expenditure series.

Changes in Type of Structure

Changes in the type of structure in which new private nonfarm housekeeping dwelling units were provided can be analyzed in terms of one-family houses, two-family houses, and three- or more-family structures (defined as multi-family structures); a more refined classification of the last category is not available.

Chart B

NEW PRIVATE PERMANENT NONFARM HOUSEKEEPING DWELLING UNITS STARTED, BY TYPE OF STRUCTURE, 1900-1950

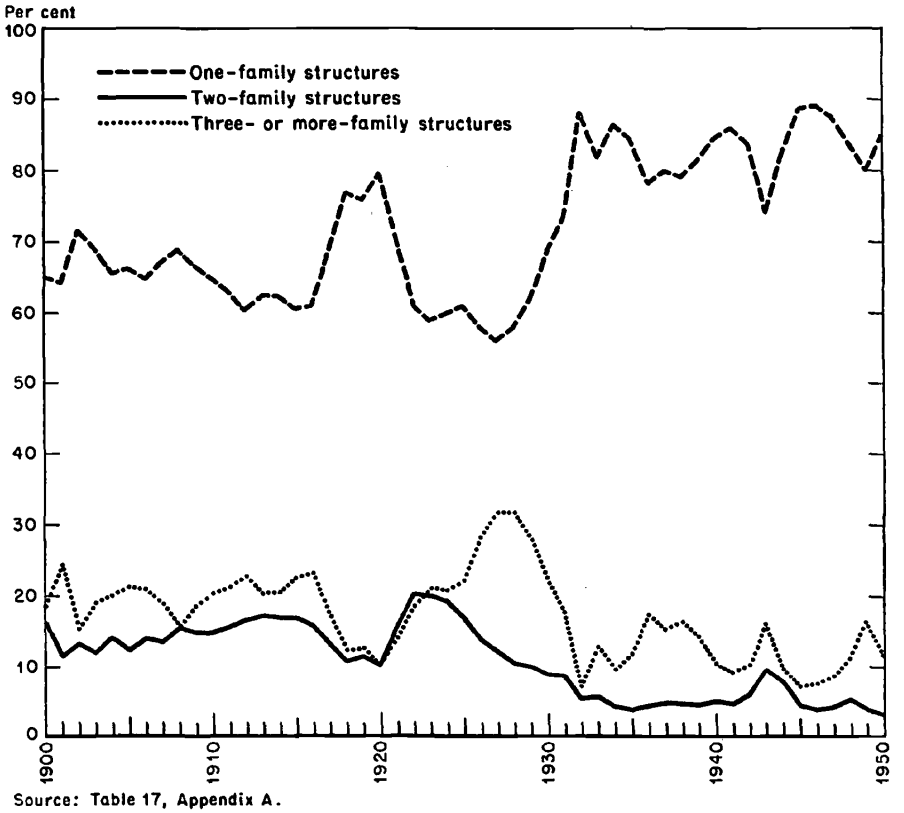


Source: Table 17, Appendix A.

[4] All relative amplitude measures in this paper were derived in the following manner. Within each peak-to-peak cycle, the trough year value and the initial and terminal peak year values were converted to relatives of the cycle average. The trough relative was subtracted from the initial and terminal peak relatives and the remainders summed. (See Burns and Mitchell, *op. cit.*, pp. 131-41).

Chart C

PERCENTAGE DISTRIBUTION OF NEW PRIVATE PERMANENT NONFARM HOUSEKEEPING DWELLING UNITS STARTED, BY TYPE OF STRUCTURE, 1900-1950



Source: Table 17, Appendix A.

The most striking change in the structure-mix of residential construction has been the major reversal since the early 1930's of the previous trend away from single-family houses. With the exception of the years 1917-20, the ratio of single-family houses to total dwelling units started declined fairly continuously over the first three decades of this century, although there was no year in this period in which such houses represented less than 50 per cent of all dwelling units started. Conversely, the proportion of dwelling units in two-family houses and multifamily structures rose over most of these thirty-odd years. (See Charts B and C and Appendix A, Table 17.)

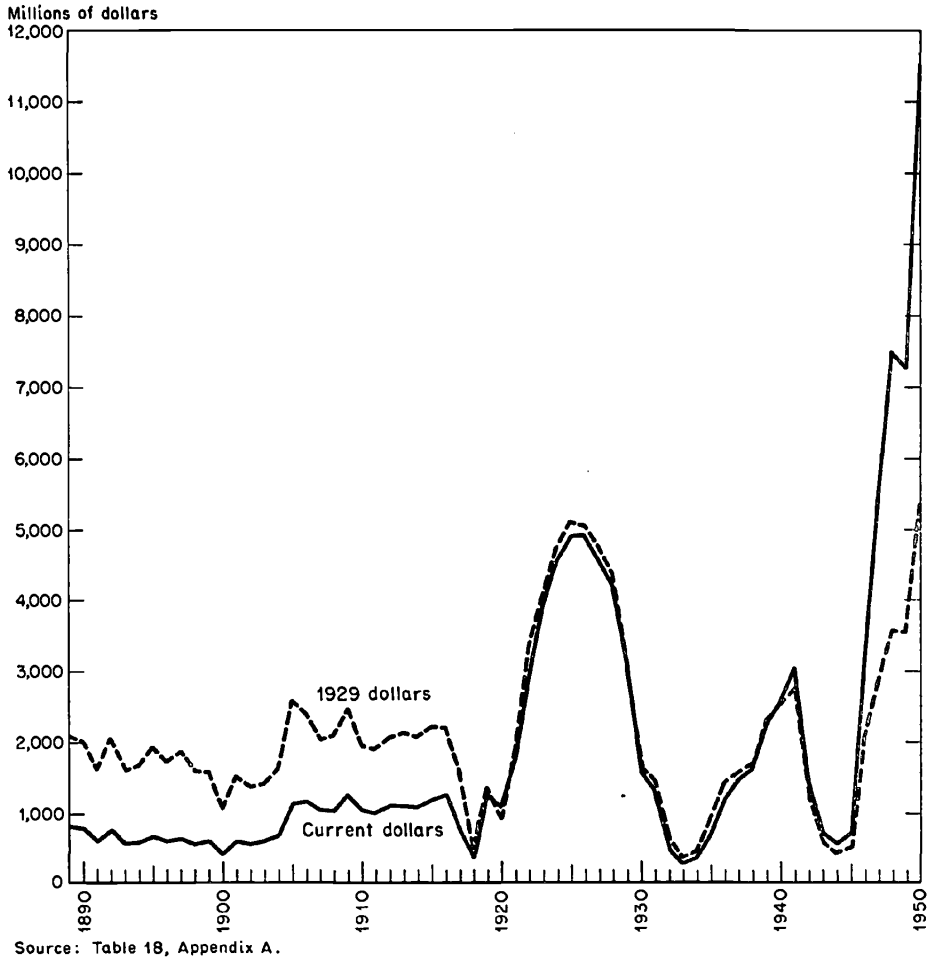
Since the early 1930's, however, the movements have been reversed. Single-family houses have, in general, accounted for a larger proportion of total dwelling units started than at any time since 1900, and the share of multi-family structures has declined; for two-family houses the proportion has dropped to minor importance.

For the first two major booms, the peak in the proportion of housekeeping dwelling units built in multifamily structures lagged behind the peak in total housekeeping dwelling units started. In the first boom period for which comprehensive data are available, the peak in the total was in 1905. Three- or

more-family structures accounted for their largest percentage of total units in the years 1912-16. Similarly, in the next boom the peak in total starts was 1925, while the peak in the proportion of units in multifamily structures was in 1927-28. The same pattern is found in the series on the absolute number of units started by type of structure, but in the first boom the relationship is not shown quite so clearly by this series as it is by the percentage distribution series.

Chart D

EXPENDITURES FOR NEW PRIVATE PERMANENT NONFARM HOUSEKEEPING DWELLING UNITS IN CURRENT AND IN 1929 DOLLARS, 1889-1950



Source: Table 18, Appendix A.

Expenditures for New Housekeeping Dwelling Units

The cycles in the number of new housekeeping dwelling units started are paralleled by long swings in expenditures for such units (Chart D and Appendix A, Table 18). The cycles in expenditures in both current and constant dollars are quite evident in the annual data.[5]

[5] The derivation of the construction cost deflator and its relation to market price indexes will be discussed in detail in the final monograph on Formation and Financing of Capital in Residential Construction. In general, construction cost indexes tend to have some upward bias.

Table 2

TURNING POINT DATES IN LONG CYCLES IN HOUSEKEEPING RESIDENTIAL CONSTRUCTION

	DWELLING UNITS STARTED	EXPENDITURES FOR DWELLING UNITS	
		CURRENT DOLLARS	1929 DOLLARS
Peak	1892	1889	1892
Trough	1900	1900	1900
Peak	1905	1909	1905
Trough	1918	1918	1918
Peak	1925	1926	1925
Trough	1933	1933	1933
Peak	1950	1950	1950
Peak	1925	1926	1925
Trough	1933	1933	1933
Peak	1941	1941	1941
Trough	1944	1944	1944
Peak	1950	1950	1950

Sources: Tables 16 and 18, Appendix A.

The turning points in the annual series on housekeeping expenditures in 1929 dollars are identical with those for the annual series on units started (Table 2).[6] The peaks in the annual series on housekeeping expenditures in current dollars lead the series on units started in 1889 and lag that series in 1909 and 1926.

The differences in timing of the turning points of the several series presented here make it difficult to form any judgment about changes in the duration of the long cycles. In the series of dwelling units started and deflated expenditures, the cycles have increased in length, but the series in current dollars shows no consistent pattern.

Decade averages (Table 3) show a rising trend of current dollar expenditures on housekeeping dwelling units, except for the 1930-39 decade. Averages

Table 3

ANNUAL AVERAGE EXPENDITURES FOR NEW PRIVATE PERMANENT NONFARM HOUSEKEEPING DWELLING UNITS, BY DECADES AND WITHIN LONG CYCLES, IN CURRENT AND IN 1929 DOLLARS, 1889-1950

(*in millions*)

DATA BY DECADES			DATA BY LONG CYCLES			
Decade	*Current dollars*	*1929 dollars*	*Period*	*Current dollars* [b]	*Period*	*1929 dollars* [b]
1890-1899	$645	$1,769	1889-1909	$740	1892-1905	$1,640
1900-1909	858	1,858	1909-1926	1,915	1905-1925	2,265
1910-1919	1,020	1,756	1926-1950	2,661	1925-1950	2,203
1920-1929	3,596	3,725				
1930-1939	1,133	1,245	1926-1941	1,976	1925-1941	2,259
1940-1950 [a]	4,007	2,320	1941-1950	3,803	1941-1950	2,105

[a] Eleven-year average.

[b] Terminal years weighted one half.

Source: Appendix A, Table 18.

[6] Long's turning point dates for current dollar expenditures for residential construction, derived as the median dates of the series for the various cities, agree very closely with those indicated in Table 2. His dates for comparable periods were 1889, 1900, 1912, 1918, 1925, and 1934 (*op. cit.*, p. 136).

for deflated expenditures, however, show little change during the first three decades, a steep rise during the 1920's, and a sharp decline in the 1930's. For the eleven-year period 1940-50, average deflated expenditures were almost 40 per cent lower than in 1920-29, whereas average annual expenditures in current dollars were 11 per cent higher than in the earlier period.

Five-year averages do not alter these observations. Average current dollar expenditures in the post-World War II period (1946-50) were more than 60 per cent higher than those in the second half of the twenties ($7,006 million compared with $4,321 million), but deflated expenditures were about 20 per cent lower ($3,491 million against $4,469 million).[7]

After price effects are eliminated, the decade of the 1920's still stands out, as it did in the earlier analysis of the number of dwelling units started, as the period with the greatest physical volume of residential construction in the past sixty years. Only in 1950 was the peak of the expenditures in the 1920's surpassed.

Here again, analysis of long-cycle averages facilitates the study of long-run movements. As shown in Table 3, averages of current dollar expenditures for the long cycles show a rise over the sixty-year period. With the 1926-50 period considered as a single cycle, the second cycle averaged about 160 per cent higher than the first cycle, and the last cycle about 40 per cent higher than the second. The rise is not interrupted, if the 1926-50 cycle is separated into two cycles, since the 1926-41 cycle average was 3 per cent higher than the 1909-26 cycle average, and the 1941-50 average was about double the 1909-26 cycle average.

The cycle averages of deflated expenditures, however, show a different pattern. There was a rise of only 38 per cent between the first and second cycles, and a slight decline between 1905-25 and 1925-50. This movement corresponds more closely to the changes in cycle averages of dwelling units started than to those of current dollar expenditures. The smaller increase in deflated expenditures between the first two cycles and the actual drop from the second to the third cycle, compared with a slight rise in the number of dwelling units started, are evidence of a long-run declining real expenditure per dwelling unit.

When the 1925-50 period is treated as two cycles, the picture is largely unchanged. The annual real expenditure during 1925-41 averaged about the same as during the previous cycle, but for the 1941-50 cycle the average dropped about 7 per cent.

The expenditure series, like the series on dwelling units started, gives evidence of the increasing amplitude of the residential construction cycle. The amplitude of the current dollar series increased by 73 per cent between the first and second cycles and more than doubled between the second and third

[7] Some small portion of this apparent decline may be due to the bias in the construction cost index used as a deflator.

Table 4

AMPLITUDE[a] OF LONG CYCLES IN EXPENDITURES FOR NEW PRIVATE PERMANENT NONFARM HOUSEKEEPING DWELLING UNITS, IN CURRENT AND IN 1929 DOLLARS, 1889-1950 AND 1892-1950

PERIOD	AMPLITUDE, % RISE & FALL OF EXPENDITURES IN CURRENT DOLLARS	PERIOD	AMPLITUDE, % RISE & FALL OF EXPENDITURES IN 1929 DOLLARS
1889-1909	163.8	1892-1905	154.3
1909-1926	282.5	1905-1925	296.2
1926-1950	596.2	1925-1950	439.8
1926-1941	373.4	1925-1941	314.9
1941-1950	353.1	1941-1950	344.8

[a] For manner of deriving amplitude, see text, note 4, above.

Source: Appendix A, Table 18.

cycles (Table 4).[8] When the third cycle is separated into two cycles, the rise is interrupted, since the amplitude for the 1941-50 cycle is slightly below that for the 1926-41 cycle. The same pattern holds for the constant dollar expenditure series, except that the increase in amplitude is continuous even in the four-cycle framework.

Average Expenditure per New Housekeeping Dwelling Unit

The average construction expenditure (in current dollars) per private nonfarm housekeeping dwelling unit started has quadrupled over the past sixty years (Chart E) as a result of the constantly rising cost of construction over this period. The deflated average expenditure per unit (Chart E), however, has declined substantially since 1889.[9] From an average of about $6,000 (in 1929 prices) during the first of the six decades, the deflated expenditure fell to an average of about $3,600 during the last decade. This decline of about 40 per cent was largely continuous over the entire period, except for some increase during the 1920's.

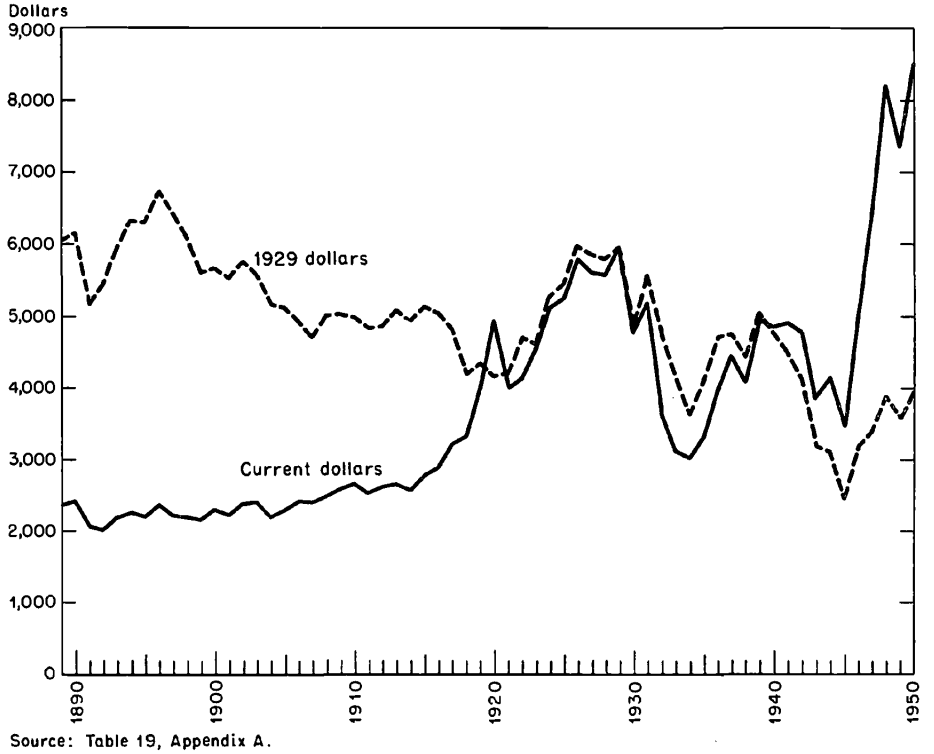
For the period since 1905 there is some indication that the deflated expenditure per unit varied cyclically with the movement of the building cycle, troughs in residential building being associated with troughs in real average expenditure, and peaks in building with peaks in real expenditure per dwelling unit. A portion of this variation is due to cyclical bias in the construction cost deflator; all construction cost indexes, including the one used in this paper, tend to be more stable over the building cycle than true construction costs or market prices of dwellings. However, it is unlikely that the bias accounts for most of the cyclical variation in real expenditure per unit. Rather,

[8] Long also found increasing amplitude of the long cycles in current dollar expenditures for residential construction for the three trough-to-trough cycles ending in the 1930's. (*op. cit.*, p. 170).

[9] The estimates in Appendix A, Table 19, are subject to some slight distortion since the average expenditures per unit were determined by dividing expenditures (work put in place) in each year by the number of dwelling units *started* in the same year. The possible upward bias in the construction cost deflator may have led to a somewhat sharper decline in the estimates of deflated average expenditures than was actually the case.

Chart E

AVERAGE EXPENDITURE PER NEW PRIVATE PERMANENT NONFARM HOUSEKEEPING DWELLING UNIT IN CURRENT AND IN 1929 DOLLARS, 1889-1950



Source: Table 19, Appendix A.

the cyclical variation suggests a shift in the composition of residential building toward more expensive units in the expansion phase of the long cycle and toward less expensive units in the contraction phase.

It appears, further, that there was some lag in the upper turning point of the deflated average expenditure series, the series reaching a maximum in the middle of the 1910-19 decade and in the second half of the 1920-29 decade, some years after the peak in construction. Not enough time has passed since the tentative 1950 peak to know whether this pattern will be followed in the present cycle.

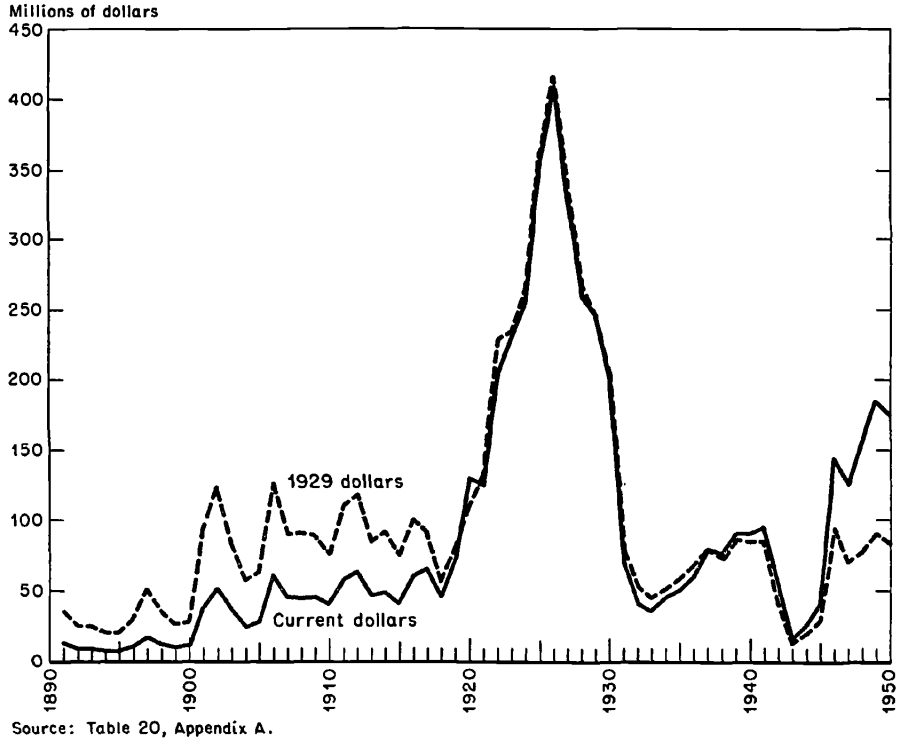
Expenditures for New Nonhousekeeping Residential Facilities

There is no comprehensive series on a physical basis for new nonhousekeeping residential facilities and there is indeed a question as to whether such a series (on the basis of square foot area, for example) would be reliable in view of the extremely heterogeneous nature of nonhousekeeping residential structures, ranging all the way from transient hotels to motor courts, tourist cabins, vacation cottages, and dormitories. Therefore, changes in this type of construction can be measured only in terms of expenditures.

Expenditure data show less evidence of long cyclical swings than do the data for housekeeping construction, although the period from the middle of the last decade of the nineteenth century to the middle of the 1910-19 decade might be viewed as one trough-to-trough cycle and the period from the middle of the 1910-19 decade to sometime in the 1930's or early 1940's as another. Disregarding short-term fluctuations, which are very pronounced in this segment of residential building, expenditures in current dollars show a gradual rise to the end of the 1910-19 decade, a more rapid rise to the middle 1920's, a decline to the early 1930's, some recovery prior to World War II, a decline during the war, and a more substantial recovery in the postwar period (Chart F and Appendix A, Table 20). Both the 1941 and 1949 peaks, however, were

Chart F

EXPENDITURE FOR NEW PRIVATE NONHOUSEKEEPING RESIDENTIAL FACILITIES IN CURRENT AND IN 1929 DOLLARS, 1891-1950



Source: Table 20, Appendix A.

far below the level reached in the mid-1920's. Deflated expenditures followed essentially the same pattern, except that the level in the 1910-19 decade was somewhat lower in comparison with that in the preceding decade and the post-1945 rise was more modest (Chart F). Deflated expenditures in the postwar period were at about the same level as expenditures in the late 1930's and in the 1900-17 period, and less than one quarter of the level at the 1926 peak.

As a consequence, expenditures for such facilities since the 1920-29 decade have declined in importance relative to expenditures for housekeeping dwelling units (Table 5). The decade averages show a rising ratio of nonhousekeeping to housekeeping expenditures over the period 1891-1929 and a

Table 5

RATIO OF EXPENDITURES FOR NEW PRIVATE NONHOUSEKEEPING RESIDENTIAL FACILITIES TO EXPENDITURES FOR NEW PRIVATE PERMANENT NONFARM HOUSEKEEPING DWELLING UNITS, BY DECADES, 1891-1950

DECADE	RATIO OF DATA IN CURRENT DOLLARS (%)	RATIO OF DATA IN CONSTANT DOLLARS (%)
1891-1899 [a]	1.7	1.7
1900-1909	4.5	4.5
1910-1919	5.3	5.0
1920-1929	7.1	7.0
1930-1939	6.6	6.4
1940-1950 [b]	2.5	2.7

[a] Nine years.

[b] Eleven years.

Sources: Appendix A, Tables 18 and 20.

declining ratio since the 1920's. The ratio for the eleven-year period 1940-50 was lower than that for any decade in this century, and the ratio for the boom period 1946-50 was even lower than that for the whole decade (2.2 per cent and 2.4 per cent for current and constant dollar expenditures, respectively).

This reversal of trend may seem astonishing in view of the vast amount of construction of such nonhousekeeping facilities as tourist cabins, motels, vacation cottages, and similar accommodations over the last decade and a half, and particularly during the postwar period. But the reversal is largely a result of the shift in the type of nonhousekeeping accommodations built. The former official estimates of hotel construction[10] average about nine tenths of the current government estimates of total nonhousekeeping construction (including hotel construction) for the decade of the 1920's, about two thirds for 1930-34, and only between one quarter and one third for the years since 1934.[11] The recent growth in nonhousekeeping construction has been largely in facilities whose construction per space unit is much less expensive than hotel construction. If nonhousekeeping construction continues to take this form, as seems most likely, a tremendous increase in construction volume over current levels will be needed for nonhousekeeping expenditures to reach the levels of the 1920's, either in absolute terms or relative to new housekeeping construction.

[10] Made before the more inclusive estimates of nonhousekeeping facilities were prepared.

[11] For estimates of hotel construction, see Department of Commerce, *Construction and Construction Materials,* Statistical Supplement, May 1949, p. 7. For estimates of total nonhousekeeping construction, see Department of Commerce, *Construction and Building Materials,* Statistical Supplement, May 1952, p. 6.