

SOME FINANCING FLUCTUATIONS IN URBAN HOUSING

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The subject of financing fluctuations in urban residential housing is of interest to present and prospective owners of real estate, as well as to the student of general and specific tendencies in this field and in economic fluctuations in general. Few statistics on this subject have been available until recently. In 1937 the results of a financial survey of urban housing were published by the United States Bureau of Domestic and Foreign Commerce, which sponsored this Civil Works Administration project. This project was conducted under the direction of David L. Wickens in 1934.¹ Using the data collected in this survey the writer made an intensive study of the financing of one-family urban dwellings between 1890 and 1933 in six cities (Cleveland, Minneapolis, Portland (Maine), Richmond, San Diego, and Syracuse), with some attention to twelve others, the findings of which, with pertinent tables, are presented and analyzed in this paper.²

These analyses and those of the results of statistical manipulation and graphing of the data were made to determine whether recurrent undulations exist in certain financing aspects of urban housing. The consequences of the procedures lead rather naturally to certain tentative conclusions and a few suggestive implications.

The selection of the particular cities chosen is not arbitrary. On the contrary, it is based on (1) the necessity for a variety of representative geographical sections, and (2) the relative abundance of data, particularly in the early years.

Certain considerations should be borne in mind in this study of urban financing fluctuations. (1) The study has been restricted to one-family dwellings. (2) The data utilized represent the original

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¹ D. L. Wickens, *Financial Survey of Urban Housing* (Washington, 1937). Although twenty-two cities were included, the data for some cities were rather meager.

² The cities less intensively studied are Atlanta, Birmingham, Dallas, Des Moines, Indianapolis, Peoria, Providence, Salt Lake City, Seattle, Trenton, Wichita and Worcester (Massachusetts).

cost of the houses at the time acquired.³ (3) Inasmuch as the data were collected in 1934 through personal interviews with owners, the basic survey could not obtain complete information concerning all transfers that have taken place, particularly in the earlier years. Theoretically, a house forty years old could be transferred that many or more times. In this survey only the last sale would be reflected in the figures. (4) It would seem that the houses most heavily mortgaged would be the most likely to be foreclosed or transferred.

Turning now to a specific consideration of the tables presented, we shall analyze separately the indications revealed by these tables.

In Table 1, the unit cost for dwellings in five of the six cities is greater for the owner-occupied than for the rented, but less in Minneapolis. The total average is \$656, against \$604 for the rented.

Of the total number of one-family dwellings on which debt was assumed, the number of owner-occupied dwellings is consistently greater throughout, by about 50%. The average of the six cities for the owner-occupied dwellings is 69.8% and 45.5% for the rented.

As to the per cent of the amount of debt assumed, again this per cent for owner-occupied dwellings is greater by almost 50% than for rented dwellings. The exception is Portland, where the converse is true.⁴ The average of the six cities is 46.3% for the owner-occupied dwellings and 38.1% for the rented.

³ Wickens, *op. cit.*, Tables 27 and 28 for each city, which were respectively headed "Owner-Occupied 1-Family Dwellings: Proportion of Cash, Trade, and Debt Involved in Transfers, by year acquired, Distribution of Original Cost, by Form of Consideration" and "Rented 1-Family Dwellings;" etc.

⁴ The Portland deflection might be accounted for by the fact that it is an older city, in conservative New England, and by the fact that its population-growth curve seems to be flattening out. Portland's total number of houses on which debt was assumed on last acquisition is the lowest of the six cities, 55.7% for the owner-occupied dwellings, and 34.0% for the rented dwellings.

TABLE 1. COMPARISON OF 1-FAMILY DWELLINGS
 Total Distribution of Original Cost as Shown by
 % Assuming Debt, % Debt Assumed, and Unit Cost—1899 or
 Before to 1934 of the Six Cities—Both Owner-Occupied and Rented

City	OWNER-OCCUPIED					RENTED				
	% Debt Assumed No.	Amt.	No. Re- porting	Total Cost in \$1,000	Unit Cost	% Debt Assumed No.	Amt.	No. Re- porting	Total Cost in \$1,000	Unit Cost
Cleveland	76.9	47.1	12,220	\$95,034	7.77	45.3	30.6	1,008	\$6,800	6.74
Minneapolis	73.8	49.3	4,494	22,676	5.04	49.4	35.6	518	4,365	8.42
Portland	55.7	33.7	548	3,328	6.07	34.0	50.8	53	248	4.69
Richmond	69.8	48.7	1,483	9,383	6.19	43.0	33.2	135	618	4.58
San Diego	61.1	42.7	3,232	14,195	4.39	42.5	30.7	651	2,441	3.75
Syracuse	81.6	56.4	690	4,143	6.00	58.8	47.4	51	141	2.78
Average of Cities	69.8	46.3	3,778	24,793	4.57	45.5	38.1	402.7	2,434	5.16
				24,793	=6.56				2,434	=6.04
				3,778					402.7	

The owner-occupied data graphed (three year moving average to smooth erratic fluctuations) show that the per cent of the number assuming debt is just ahead of the per cent of debt at the turns in the case of Cleveland. For Syracuse at the turns, the per cent of debt assumed is behind the number assuming debt. They synchronize for the other four cities. The long trend seems to be a rise for both per cent debt and per cent of total number assuming debt, and, of course, a decrease of per cent equity.

In Table 2 the highest point in per cent debt assumed (over 50%) seems to be reached between 1929 and 1932.⁵ The spread of the highs is 42% (Peoria, 1932) to 67% (Syracuse, 1931), with most of the cities around 60%. The average of the cities is 58.8% for the highs and 15.1% for the lows. The lowest points are not so consistent, most of them being clustered (1899-1903) and ranging as far as 1895 to 1912 (Seattle and Richmond, respectively). The per cent debt at the low varies from less than 4 to 35%, with the greatest concentration around 20%.

Of those assuming debt, the majority of the highs occurred between 1929 and 1932 and were in the 80 per cents. The lows occurred between 1900 and 1905, but the per cents were more variable, from 25 to 47. The average for the six cities was 82.0% for the highs and 31.8% for the lows.

The average cost of the owner-occupied dwellings at the peaks varied anywhere from \$4400 (Seattle, 1926) to \$11,000 (Indianapolis, 1931). The average of the cities was \$7200. The dates of these

Unit Cost of Owner-occupied Dwellings at the Highs

Value Class	No. of Cities
\$ 4,000- 4,999	1—Seattle
5,000- 5,999	5—Des Moines, Salt Lake City, Wichita, San Diego, Birmingham
6,000- 6,999	4—Dallas, Trenton, Peoria, Atlanta
7,000- 7,999	0
8,000- 8,999	5—Portland, Providence, Richmond, Syracuse, Minneapolis
9,000- 9,999	1—Cleveland
10,000-10,999	1—Worcester
11,000-11,999	1—Indianapolis

⁵ Trenton excepted in 1904 with 60%.

⁶ Confirmed by graphs not published here due to lack of space.

⁷ Seattle, 1 year; Minneapolis, 3; Atlanta, 3; Indianapolis, 4; Trenton, 4; Des Moines, 9; and Salt Lake City, 13 years.

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TABLE 2. HIGH AND LOW POINTS (Dates of 3-Year Moving Average) 18 Cities

City	OWNER-OCCUPIED								RENTED		
	High (H) Low (L)	% Equity		% No. As- suming Debt		% Debt		Unit Cost	Unit Cost		
		Year	%	Year	%	Year	%	Year	\$1000	Year	\$
Albany	H	1902	78	1929	86	1931	52	1927	9.8	1924	
	L	1931	48	1902	46	1902	22	1900	2.6	1898	
Albany	H	1908	84	1926	70.0	1932	57	1925	8.1	1922	
	L	1932	43	1900	12.1	1908	16	1899	2.3	1904	
Albany	H	1903	75	1929	92	1931	67	1927	8.5	1928	
	L	1931	33	1903	47	1903	25	1896	1.8		
Albany	H	1899	88	1930	85	1932	60	1928	8.9	1927	
	L	1932	40	1892	18	1899	12	1902	2.5	1898	
Albany	H	1912	79	1931	87	1931	62	1928	8.3	1918	
	L	1931	38	1902	34	1912	21	1898	1.2	1913	
Albany	H	1904	93	1932	72	1932	56	1927	5.6	1929	
	L	1932	44	1905	25	1904	7	1898	1.1	1917	
Albany	H	1892	82			1931	66	1924	6.6	1928	
	L	1931	34			1892	18	1895	2.0	1906	
Albany	H	1901	87			1932	59	1929	5.5	1930	
	L	1932	41			1901	13	1896	.4	1906	
Albany	H	1906	84			1930	66	1926	6.0	1923	
	L	1930	34			1906	16	1899	1.1	1901	
Albany	H	1897	96			1932	61	1925	5.0	1927	
	L	1932	39			1897	4	1906	2.1	1906	
Albany	H	1899	91			1932	57	1931	11.0	1925	
	L	1932	43			1899	9	1903	1.7	1903	
Albany	H	1898	—			1932	42	1926	6.5	1923	
	L	1932	58			1898	0	1896	2.7	1908	
Albany	H	1899	79			1925	51	1929	8.3	1927	
	L	1925	49			1899	21	1892	1.8	1917	
Albany	H	1895	88			1932	66	1928	5.0	1924	
	L	1932	34			1895	12	1908	2.2	1899	
Albany	H	1899	96			1932	59	1926	4.4	1927	
	L	1932	41			1899	4	1900	2.3	1896	
Albany	H	1901	77			1904	60	1926	6.4	1910	
	L	1904	40			1901	33	1905	2.5	1906	
Albany	H	1902	96			1932	53	1928	5.1	1912	
	L	1932	47			1902	4	1899	1.5	1909	
Albany								(1930)	(10.0)		
	H	1907	65			1929	64	1896	31.3		
Albany	L	1929	36			1907	35	1894	2.6		
	H		84.6		82.6		58.8		7.2		
Average of Cities	L		41.2		31.8		15.1		1.9		

peaks were from 1924 to 1931, with most of them around 1928. The lows fell in the years 1895 to 1906, with most about 1899-1900; and in unit cost varied between \$400 (Birmingham, 1896) and \$2700 (Peoria, also 1896), with most of the cities in the lower \$2000 class. The average for the cities was \$1900 at the lows.

The unit cost of the owner-occupied dwellings reached a peak for every city, except Providence, Trenton, and Worcester, from one to seven years prior to the per cent debt assumed peak.⁶ In seven⁷ out of eighteen cities, the per cent debt assumed reached its depth prior to unit cost. There does not seem to be any correspondence in these averages between per cent debt assumed and unit cost at the low points. There appears, however, to be a tendency for unit cost to precede per cent debt assumed at the high points. The unit cost variations might be summarized as follows:

High			Low		
Average of cities	Spread in		Average of cities	Spread in	
	Amounts	Years		Amounts	Years
\$7200	\$4400 to \$11,000 ⁸	1926 to 1931	\$1900	\$ 400 to \$2700 ⁹	1894 to 1906

A comparison of rented with owner-occupied unit costs, shows that the rented usually had the prior peak,¹⁰ but the spread was as great as fourteen years, e. g., Wichita. In all cases except Providence and Wichita, the unit cost is higher for the owner-occupied, at the highs. The average of the cities at the highs was \$6100 for rented and \$7200 for the owner-occupied. As to the lows, in all but Cleveland, Minneapolis, Salt Lake City, and Seattle, the rented reached the low after the owner-occupied, with many years lag. Again, the unit costs were lower for the rented, with the exception of Portland, Richmond, San Diego, Birmingham, Dallas, and Wichita. The average of the cities was \$1900 for owner-occupied and \$1400 for the rented.

The highs of the rented dwellings were reached mainly between 1927 and 1929 (exceptions: Cleveland 1924, Portland 1922, Richmond 1918, Wichita 1912, and Trenton 1910). They varied in dollar cost from \$4100 to \$9400 and have the greatest concentration in the \$4000 class. The average of the cities at the high for

⁸ Seattle in 1926 and Indianapolis in 1931, respectively.

⁹ Birmingham in 1896 and Peoria in 1896, respectively.

¹⁰ The exceptions were Birmingham, Seattle, and Syracuse, which had a one-year lag of rented behind over-occupied; Des Moines and San Diego, 2 years; and Atlanta, 4 years.

TABLE 3
 DATES OF SPECIFIC CYCLES OF SEVEN CITIES—
 By % Debt and Unit Cost (Owner-Occupied) and the
 Reference Cycle Used¹¹

City		1		2		3		4		5	
		High	Low	High	Low	High	Low	High	Low	High	Low
Cleveland	% Debt	1898	1902	1907	1910			1931			
	U. Cost	1897	1900	1904	1905			1927			
Minneapolis	% Debt	1896	1899	1903	1906	1913	1915	1932			
	U. Cost		1895	1899	1902	1912	1914	1918	1919	1928	1932
								1922	1923		
Portland	% Debt	1894	1900	1903	1908	1911	1917	1932			
	U. Cost	1895	1899	1909	1914			1925			
Richmond	% Debt	1898	1902	1908	1912	1916	1917	1931	1932		
	U. Cost	1894	1898	1901	1904	1914	1917	1928	1932		
San Diego	% Debt			1903	1904	1910	1916	1932			
	U. Cost	1896	1898	1899	1900	1914	1917	1927	1932		
				1904	1906						
Syracuse	% Debt	1897	1903	1908	1910	1914	1917	1931			
	U. Cost			1903			1915	1926			
Birmingham	% Debt	1891	1894	1906	1911	1916	1917	1926	1930	1932	
	U. Cost	1898	1901								
		1892	1896	1903	1905	1912	1916	1928	1932		

REFERENCE CYCLES¹¹

Low High Low High Low High Low High Low High Low
 1887 1892 1897 1902 1907 1912 1918 1925 1932

¹¹ Syracuse cycles of construction activity, according to Barbara Ross, *Long Cycles in Residential Construction* (M. A. thesis, U. of Pa., 1940). It is interesting to compare these dates with the following, derived from "Exhibit 20" in J. R. Riggelman and I. N. Frisbee, *Business Statistics*, 2nd ed. (New York, 1938), p. 533.

Wendick's		Building Cycles		Ross's Syracuse Construction Activity	
Low	High	Low	High	Low	High
1805	1815				
1825	1835				
1845	1852	1843	1853		
1862	1872	1864	1871		
1878	1888	1877 (94)	1887		
1898	1906	1890 (95)	1897	1892	
1918	1921	1900 (08)	1909 (06)	1902 (12)	
1922	1925	1918	1925	1918	
				1925	

Unit Cost of Rented Dwellings at the Highs

Value	Class	No. of Cities
\$4,000-4,999	6—Seattle, San Diego, Salt Lake City, Des Moines, Dallas, Peoria	
5,000-5,999	4—Indianapolis, Birmingham, Atlanta, Trenton	
6,000-6,999	1—Wichita	
7,000-7,999	3—Portland, Minneapolis, Richmond	
8,000-8,999	2—Providence, Syracuse	
9,000-9,999	1—Cleveland	

the rented was \$6100. The lows were more scattered, 1896 (Seattle, \$700) to 1917 (San Diego, \$1800, and Providence, \$1000) with nine out of sixteen in the 1900's. The unit cost for the rented at the low varied between \$700 (Seattle, 1896) and \$2400 (Portland, 1904).

In every case the unit costs for both the rented and owner-occupied dwellings were lower at the low point than at the high. The same is true of the per cent debt assumed of the owner-occupied, and for the per cent of the number assuming debt.

In Table 3 we note that unit cost precedes per cent debt assumed at both peaks and lows, except Portland, San Diego since 1910, and Syracuse. Usually the highs come later than the reference dates used.¹² The situation differs in the case of the lows, which may be summarized for the seven cities as follows: In reference cycle 1 (1897), the unit cost and the per cent debt assumed follow the reference cycle low, while in reference cycle 2 (1907), they usually precede.¹³ In reference cycle 3 (1918) the cost and debt again precede the reference low, while at the reference cycle 4 low they generally come before or agree with the reference low.¹⁴ In short the specific cycle dates all come later than the reference cycle dates for cycle 1, but thereafter for the lows the converse is usually true. There seems to be greater variation in timing of the highs and lows for the various cities since 1917.

The graphs also show the action for the other cities.¹⁵ Unit cost of rented usually declines prior to owner-occupied, while on

¹² The exceptions are in Reference Cycle 1 (1892) % Debt; Birmingham; Unit Cost: 2 (1902) Minneapolis 3 years, Richmond 1 year; 3 (1912) Portland 1 year; 4 (1925) none.

¹³ Except in (a) per cent debt assumed: Cleveland with 3 years' lag; Richmond, 5 years; Portland, 1 year; and Birmingham, 5 years. (b) unit cost: Portland lags 7 years.

¹⁴ Except in (a) per cent debt assumed: Cleveland, Portland, San Diego, Syracuse and Minneapolis lag. (b) unit cost: Cleveland, Portland, and Syracuse lag.

¹⁵ *Vide*, note 7.

the turn to the rise cost of rented dwellings leads but not so frequently. As to amplitude, the rented apparently do not rise as high but fall about the same, so that for the rented the down troughs seem more pronounced, but for the owner-occupied the rises and tops seem more pronounced.

Per cent debt assumed continues to rise after unit cost starts to fall in the case of owner-occupied dwellings. This comparison cannot be made for the rented dwellings because of the insufficient data. The per cent debt also lags on the up-turn. This lag in per cent debt is also revealed in the following tabulation, compiled from Table 3:

Number of Years Unit Cost Precedes Per Cent Debt Assumed in Each Specific Cycle, by Cities

HIGH in years				CITY	LOW in years			
1	3	—	—	Cleveland	2	5	—	4
—	3	1	10	Minneapolis	4	4	1	—
4	7	2	3	Richmond	4	8	0	0
-1	-6	—	7	Portland	1	-6	—	7
—	4	4	5	San Diego	—	4	-1	—
—	5	—	5	Syracuse	—	—	2	—
6	3	4	-2	Birmingham	5	6	1	-2
3.3	2.84	3.66	4.66	Average	3.2	3.5	0.6	2.25

This confirmation also showed that only 14.3% and 15.0% of the high and low cases, respectively, were the reverse, viz., per cent debt assumed led unit cost at the turns but by not more than six years. The average of the cycles revealed 3.6 years and 2.4 years for the high and the low, respectively, of unit cost leading at the turns.

The graphs appear to show that unit equity of owner-occupied dwellings had a tendency to precede unit cost at the turns. It is interesting to compare the behavior of certain data with the reference cycles.¹⁶ The transactions appear to be fewer in number at the peak and more numerous, relatively, at the low, except for the last cycle. This is probably because of the lack of survival of the transactions at the peak and the contrary at depression lows, when possibly those most able to carry real estate acquired it. Unit costs for Syracuse appear to reach a peak after the building peak. The per cent debt assumed seems to have a tendency to increase in the declining phase of the cycles. Both per cent debt and unit cost appear to have a tendency to lag at the turning points of the reference cycle.

¹⁶ Syracuse's specific cyclical dates of construction activity.

The number of transactions in general precedes the per cent debt assumed in the case of the owner-occupied. Charts which combine the figures for the rented and the owner-occupied tend to confirm the above findings, viz., the lead of unit cost at the turns over that of the per cent debt assumed. The same tendencies appear in the data with greater smoothing by means of five year moving averages.

The graphs which show the three year moving average of unit costs for both the rented and owner-occupied, and also the per cent debt assumed for the owner-occupied, tend to verify previous statements. Over the long term, all three types of data have a tendency to rise.

The rented unit cost seems continuously to be on a somewhat lower level and to anticipate the down turns while lagging on the up turns. The per cent debt assumed of the owner-occupied lags still more on the down turns. On the up turns per cent debt tends to lag, too. However, no invariable rule is followed.

Application of The National Bureau's Measures of Cyclical Behavior to the Data — Unit Cost and Per Cent Debt Assumed

The data for the owner-occupied (three year moving average of unit cost and per cent debt assumed) of the six cities was treated by the procedure followed by the National Bureau of Economic Research.¹⁷ ¹⁸ The summaries of the detailed results of this method are given in the Appendices. The results show that there were about three specific cycles covered on the average, with a spread of two to four cycles for individual cities for the per cent debt assumed. There is more variation for the unit cost: one to five cycles for the specific cities, and an average of three and a third for the unit cost specific cycles.

The average duration of full specific cycles of all cities is 12.7 years for per cent debt assumed, with a spread between 9 and 16½ years for the average of individual cities. For a single cycle of the individual cities, the average duration is as low as 5 years (Richmond, 1912-1917) and as high as 22 years (San Diego, 1910-1932). The comparable figures for the unit cost are an over-all average of 13

¹⁷ *Bulletin* 57, July 1, 1935. This method was revised in accordance with W. C. Mitchell's unpublished volume II of *Business Cycles* and Dr. Simon S. Kuznets' unpublished lectures in statistics in 1939, at the University of Pennsylvania.

¹⁸ The data are adjusted for inter-cycle trend before averaging the different cycles, by expressing each individual year as a percentage of the average of the cycle. Then the cycles are made further comparable, by dividing each into five stages, and a standing or average value for each stage of each cycle is computed.

years with a spread of 7.4 to 23 years. For an individual cycle for individual cities the range of the full specific cycle is 4 years (Minneapolis, 1917-1923) to 23 years (Cleveland, 1904-1927).

The contraction phase for per cent debt assumed averaged 3.6 years (2.5 years for Richmond to 5.7 years for Portland) and was shorter, with the exception of Portland, on the average, than the expansion which averaged 9.1 years (6½ years for Richmond to 13 years for Cleveland). The spread for individual city cycles on contraction was one year (San Diego, 1903-1904 and Richmond, 1916-1917, 1931-1932) to six years (Portland, 1894-1900; 1911-1917), and on expansion three years (Portland, 1900-1903) to 21 years (Cleveland, 1910-1931). On the average, the expansion phase lasted about two and half times as long as the contraction. Portland had two cycles (first two of three) in which contraction was longer than the expansion. Richmond had a similar longer contraction in its first cycle (out of four).

The contraction phase of unit cost averaged four and a half years (2 years for Cleveland to 12 years for Syracuse) and was shorter (except for Syracuse) on the average than the expansion. The expansion averaged eight and a half years (4.8 years for San Diego to 13 years for Cleveland). The spread for individual city cycles on contraction was one year (Cleveland, 1904-1905; Minneapolis, 1918-1919, 1922-1923; and San Diego, 1899-1900) to twelve years (Syracuse, 1903-1915). The spread for individual cities on expansion in the case of unit cost was one year (San Diego, 1895-1896, 1898-1899) to twenty-two years (Cleveland, 1905-1927). The expansion phase of unit cost, on the average, lasted almost twice as long as the contraction, except for Syracuse. Richmond had its first cycle (out of four) in reverse order of relative phase duration, i. e., contraction longer than expansion phase. Similarly, San Diego's contraction was longer in its first cycle (of five cycles). This may probably all be accounted for by the bias of the data utilized due to survival.¹⁹ Accordingly, we can summarize by saying that the contraction period is in general about 28 and 35 per cent of the full cycle for the per cent debt assumed and for the unit cost, respectively.

The amplitude of the cyclical movements appeared to rise both in the unit cost and in the per cent debt assumed, with the expansion averages increasing by about 1/5 of the per cent debt assumed

¹⁹ *Supra*, pp. 79-80.

and almost $1\frac{2}{5}$ times for the unit cost.²⁰ However, on a yearly basis the net increase on expansion was about a third for the per cent debt assumed; whereas for the unit cost there was only a slight increase, with San Diego showing a slight shift downward.

The average rise a year in the amplitude of cyclical movements was almost two-thirds of the average fall a year for the per cent debt assumed (-23.1 , fall, and $+14.1$, rise); while for the unit cost the fall averaged about eight per cent less a year than the rise a year ($+12.2$, rise, and -11.3 , fall).

The average values in cyclical phases of the series with the average per cent rise or fall from the same phase of the preceding cycle are:

Phase	% Debt Assumed	Unit Cost
Low	-16.1 ($+1.0$, Richmond, to -55.7 , San Diego)	-11.2 (-1.8 , Minneapolis, to -26.1 , Portland)
High	$+9.2$ ($+4.4$, Minneapolis, to $+34.6$, San Diego)	$+0.5$ ($+1.4$, Minneapolis, to $+15.2$, Portland)
Full Cycle	43.8 ($+17.5$, Syracuse, to 92.4 , San Diego)	39.5 ($+23.2$, Minneapolis, to $+61.1$, Richmond)

The above gives an idea of the intra-cycle trends.

The description of the graphs, showing the specific cyclical patterns of both owner-occupied unit costs and per cent debt assumed of the six cities and their average, and the comparable reference cycle patterns follow. The chart for Cleveland shows that the amplitude varies even more greatly for the unit costs than for the per cent debt assumed. There is a bias upward for unit costs and downward for per cent debt assumed. There is an irregular conformity of the per cent debt assumed. Unit cost has the greater amplitude. In each case the duration of the specific cycle is much greater than the reference construction cycle used in this comparison.

The chart for Minneapolis also reveals a great amplitude in both instances, but not so great as for Cleveland. The per cent debt assumed, however, has the greatest amplitude. The durations are less than those of the reference cycle. There is a greater conformity to the reference cycle in the case of per cent debt assumed, which tendency is the opposite of that for Cleveland where the unit cost conformed the best. The conformity of the unit cost in Minneapolis is rather irregular. A much more upward tilt in the specific unit cost occurs in both patterns of the two cities. The declining phase for the per cent debt assumed is less precipitous for Minnea-

²⁰ No adjustments were made for changes in the price level.

polis. Portland's cyclical variations show the greatest amplitude for the per cent debt assumed. The unit cost duration is longer for the unit cost as compared with its reference cycle. The per cent debt assumed has a greater amplitude for Minneapolis than the unit cost.

The most noteworthy difference in Richmond's chart is the down dip of the reference cycle of the per cent debt assumed at the peak of the specific cycle. Thus is demonstrated a more irregular relationship to the reference cycle. The specific cycle pattern of the unit cost is the closest yet revealed. The Richmond specific patterns of the unit cost and the per cent debt assumed are very close but their amplitudes are less than those of their reference cycles. In the case of San Diego, the unit cost shows some lack of conformity. San Diego shows a great amplitude for the per cent debt assumed. Here the conformity is closer than that of unit cost to its reference cycle. The per cent debt assumed of San Diego has a great amplitude. Syracuse's chart is most interesting because the reference cycle used throughout this study is that of Syracuse building cycles. The unit cost amplitude and duration are both remarkable. For Syracuse the per cent debt assumed leads at the peak. Syracuse, like Cleveland, has the greatest amplitude in the unit cost.

When the average standings of the above six cities are averaged and plotted, there appears, of course, a somewhat greater degree of conformity in the cyclical pattern. The amplitudes continue to be larger than those of their respective references', especially unit cost, which is larger than per cent debt assumed. The durations are more in conformity, the per cent debt assumed being greater and the unit cost less than their respective reference cycles. The averages of the specific cycles show an upward tilting, as did all of the individual cities with the exception of Cleveland's unit cost. The per cent debt assumed shows less conformity to its reference cycle. The declining phase is shorter than the rising phase in both amplitude and duration for both the unit cost and the per cent debt assumed of the owner-occupied.

SUMMARY

1. The unit cost of the owner-occupied dwellings is, in the main, consistently greater throughout the cycle than the unit cost of the rented, i. e., rented unit cost is usually at a lower level than that of the owner-occupied unit cost. This difference may be partially accounted for by the fact that the former prospective owners

had built for themselves or were buying a house for which they may have paid a little more than its value.²¹ Such optimism was the result of (1) an anticipated improvement in financial prospects of buyers, (2) the consideration of the desirability of a life-time purchase, (3) the desire for more gadgets, equipment and facilities, and (4) unfamiliarity with costs or values of the owner-occupant at the time of purchase as compared with the knowledge of a builder or of a pure business investor. Furthermore, the rented dwellings are more likely to have been acquired by foreclosures. Moreover, a builder who, being unable to sell his constructed houses, subsequently rents them, obviously has a lower investment (his profit being excluded). Possibly the optimism of the buyer-owner-occupant and the pragmatism of the buyer of the now-rented, may be of somewhat more importance than is general credited. However, the relative importance of these and other factors can be determined in part by another study.²² D. L. Wickens states that rented houses are usually valued at lower figures than those occupied by their owners.²³

2. The per cent of the total owner-occupants who assume debt is about one-half as great as for the rented-occupants. This difference might be explained in part by foreclosure followed by the transition of the former mortgagee into the role of lessor in order that he may realize some income. Furthermore, frequently lenders are willing to advance a greater portion of the price of a dwelling if the borrower intends to live in his acquisition.²⁴ It may also be noted that buyers are often offered more liberal terms if occupancy accompanies the purchase. A person buying a dwelling as an investment not to be lived in would be more likely to be conservative and would be less likely to purchase on the proverbial shoe string basis.

3. The owner-occupants seem to have a greater percentage of the debt assumed than the renter-occupants. This probably is due to reasons similar to those under "2", above.

4. Apparently, there is a tendency for the rise and fall of the amount of the per cent debt assumed and the per cent of the total

²¹ Value as used here refers to the amount of money the property would command in the market.

²² Cf. Karl Pribram, "Residual, Differential, and Absolute Urban Ground Rents and Their Cyclical Fluctuations" (*Econometrica*, VIII, pp. 62-78 (1940)).

²³ D. L. Wickens, *Differentials in Housing Costs* (National Bureau of Economic Research, *Bulletin* 75 (1939)), p. 4.

²⁴ This point is hard to check, because almost one-quarter of mortgage loans are made by individuals.

number assuming debt in the case of the owner-occupants to fluctuate together. Both show a prolonged period of upward trend. It is a question of how much of this upward tendency is caused by the bias of the survey, because many of the older debtors have been removed by foreclosure and by payment.

5. There also seems to be a tendency for the unit costs of both the renter-occupied and the owner-occupied to increase. In part, this is accounted for by the rising price level, higher standards of living, inventions, an increase in home and housing gadgets, better materials and equipment in plumbing and heating, and increasing urban population.²⁵

6. In the case of owner-occupied dwellings there is indicated a stronger tendency for the unit cost to reach a peak prior to the per cent debt assumed and for a majority of the unit cost to reach a depth prior to the per cent debt assumed.²⁶ This tendency may partially be explained by the fact that in order to move (sell) the sellers were willing to take less cash as a down payment. They become accustomed to advance, or to have others advance, a per cent of the old price which becomes an absolute amount in their eyes. With declining prices, this becomes a relatively larger per cent. The lag at the low may be attributed to the asking for the same down payment in absolute amount. Or, more probably, it is explainable by more conservative financing, i. e., decrease in the per cent debt assumed. In short, there appears to have been a certain stickiness to the terms of financing.

7. The rented unit cost usually enjoys a prior high than the owner-occupied unit cost, but the converse is generally true at the low. The explanation at the high may be that houses built or bought to be rented are primarily acquired by persons who know more and look upon the purchase from a pure investment angle with no desire to use rose-colored glasses proffered by the salesman to the prospective consumer-owner. Foreclosures might also be a contributing explanation. Moreover, if the incentives to build and own have been realized, and are realized first by the upper income levels, a greater supply of vacant houses is available for rent. Thus there are decreased expectations for the amount of rent and an increase in the demand

²⁵ Cf. L. J. Chawner, *Construction Activity in the United States, 1915-17* (Washington, 1938), p. 26.

²⁶ "Thus lower interest rates and more favorable terms are conducive to more expensive houses" (Wickens, *op. cit.*)

among the lower income levels which naturally result in lower average prices for the acquisition of rented houses.

To rationalize this opposite behavior at the trough, let us assume that (1) it coincides with a business depression and then (2) with business prosperity. Under conditions of business stagnation, persons with ready cash or with larger incomes are more likely to build homes for themselves because they feel that prices are low or because they wish to realize their "dream house."²⁷ At the same time, investors who wish to rent are afraid to buy or to pay a great deal because of the number of vacancies, poor business conditions and the probable financial income of most prospective renters. In times of business prosperity, similar reasoning could be employed, omitting (1) lack or uncertainty of financial income, and (2) "doubling up," with its consequent relative plentitude of houses. The owner-occupant buyers could afford to pay more and would desire to obtain more in the way of facilities and are more likely to acquire with somewhat of a speculative-investment motive. The lack of data available for an understanding of this problem might well be the stimulus for investigation.

8. The unit cost of the rented dwellings usually does not rise as high and falls less than the owner-occupied, in absolute. This statement is obviously related to "1", above, and needs no further comment here.

9. Rented unit cost generally anticipates down turns of reference cycles and lags at the up-turns.²⁸ It must be remembered that the rented dwellings are more in the nature of a producer's good, while the owner-occupied dwellings are more of a consumer's good.

10. For the owner-occupied, in general, the number of transactions precede the per cent debt assumed, which would seem to indicate that the lowering of financial requirements was not the cause of real estate activity but that in order to maintain activity, financial requirements have been lowered. In short, real estate activity precedes per cent debt assumed or the relative amount of mortgage to the purchase price.

11. The per cent debt assumed of the owner-occupied dwellings in general lagged at both the down and the up turns of the reference cycle. The cause in part may be found in the attempts to

²⁷ "The amount spent on housing is usually related to income, although within income groups there are wide variations" (*ibid.*, p. 14).

²⁸ Cf. "7", *supra*.

maintain or to minimize the decrease of real estate activity on down turns and also in the rigidity of the financing terms. On the upswing, the lag might be accounted for by the pessimism of the mortgage money advancers. This would seem to indicate, since the amount and number of per cent debt assumed move together, that mortgages lag as compared with real estate activity.

12. Usually both units costs and per cent debt assumed of the owner-occupied dwellings lagged behind the reference cycle turning points. In "6", above, we discussed the inclination of unit cost to precede per cent debt and in "11", above, the lagging of the per cent debt behind the reference cycle. Thus the question remaining to be considered is that of the lag of unit cost at the turning points of real estate activity. The tendency may be accounted for by the fact that although some of the higher income groups are less affected, they will build or buy new homes, abandoning the old, or they will build or buy for their children. This would tend to give more weight to the more expensive units. The longer period of construction of the costlier houses would add to this weight because title normally is not acquired until completion of the structure.

13. In general, the unit cost and the per cent debt assumed of the owner-occupied dwellings show a greater amplitude than the construction cycles, with the former tending to be the greater. The amplitude, of course, is larger on expansion and less on contraction; there is a greater disparity in the case of unit cost, which has a change per year greater on the decline for the per cent debt assumed.

14. The cyclical duration of the owner-occupied of both the per cent debt assumed and the unit cost is greater in general than their respective reference cycles.

15. Both unit cost and per cent debt assumed show little conformity to the general construction cycle, some cities, of course, being closer than others.

16. The average duration of specific cycles and the reference cycles and their phases in years and the maximum possible spreads are:

<i>Cycles Specific</i>	<i>Full</i>	<i>Contraction</i>	<i>Expansion</i>
Unit Cost	13.0 (4-23)	4.5 (2-12)	8.5 (1-22)
% Debt Assumed	12.7 (5-22)	3.6 (1- 6)	9.1 (3-21)
Reference	11.25	5.75	5.5

The figures in parentheses represent the greatest spread of individual cycles and phases resulting from the selection of the lowest and highest of the different individual cities. In general, for the owner-occupied, the per cent debt assumed lasted about two and a half times as long as the contraction phase, while the unit cost's expansion lasted almost twice that of its contraction. In other words, the contraction period was about 28 and 35% of the full cycles for the per cent debt assumed and the unit cost, respectively. It is interesting to note that in contraction the unit cost was slightly longer, while in the expansion, the per cent debt assumed was longer but not as long either relatively or absolutely.

It is interesting to compare the above reference duration with Riggleman and Frisbee's real estate cycles and Roy Wenzlick's building cycles.²⁹

Cycles Reference	Dates	No. of Cycles	Full In years	Expansion in years	Contraction in years
(Construction)	1887-1932	4	11.25	5.5	5.75
Real Estate	1805-1933	7	18.3	9.0	9.3
Building	1843-1934	5	18.2	9.2	9.0

From the above it is obvious that the real estate and the building cycles are divided into about equal phases, expansion and contraction. Also, real estate cycles appear to be decreasing in duration.

17. There is a great variety of cyclical patterns for the two financial aspects studied. "The period required to pass from one stage of the [real estate] cycle to another may vary widely from time to time and from city to city."³⁰

It should be repeated that the above inductive observations are tentative. The relatively short period covered, the sampling of only a few cities, the bias of the data—the use of survived data because it was only collected for a 43 year period and at that, only once, at the end of the period, must be borne in mind. All this makes the observations at the most mere tendencies. There are so many variable, independent, and mutually interacting dependent factors that all share in some way in the results obtained.

CONCLUSIONS

We can, therefore, draw the following conclusions as to tendencies.

²⁹ Adapted from Riggleman and Frisbee, p. 533.

³⁰ A. M. Weimer and H. Hoyt, *Principles of Urban Real Estate* (New York, 1939), pp. 123 et seq.

1. Owners usually pay more,³¹ borrow more often, and are more likely to borrow more heavily at all times and under all conditions than persons who acquire property to be rented.

2. Over a period of time there has been an upward trend in (1) prices (unadjusted for changing price level), (2) per cent of debt assumed and (3) relative number of people acquiring dwellings on a non-full cash basis, whether acquired for occupancy or for renting.

3. The sequence at the reference (construction) high seems to be as follows. The unit cost of the rented and rents³² of one-family dwellings lead at the peak.³³ Then, owner-occupied unit cost follows, which is succeeded by the lagging per cent debt assumed of the owner-occupied. At the reference low, the situation is more mixed, the usual order being (1) the unit cost of the owner-occupied, (2) the construction, (3) the rented unit cost, and (4) the per cent debt assumed of the owner-occupied.

4. The amplitude of the unit cost is greater than the per cent debt assumed as compared with their respective general reference cycles.

5. Both unit cost and per cent debt assumed have a greater duration (about 13 years) than their general reference cycle. The contraction phase is much shorter than the expansion phase.

SOME IMPLICATIONS

If we wish to encourage owner-occupancy,³⁴ obviously, loans will have to increase both relatively and absolutely, which means either that more capital accumulation will be required or that a greater shift in present investment to mortgages and homes must occur. Costs and values are surprisingly low during this period. This would tend to show poor construction, materials, and facilities in general. Accordingly, still more housing investment would be required for a fair standard of living.

Inasmuch as debt seems to lag, it generally was not the prime cause of overbuilding. Increases and decreases in credit extension could possibly be used to even out construction activity. Hence,

³¹ Cf. Wickens, *op. cit.*, p. 4.

³² "When rents cease to rise and begin to move down, this is an early warning of a decline—which may definitely begin within the next few years." Weimer and Hoyt, *op. cit.*, p. 144.

³³ "Both the movement of mortgages recorded and the amount of building activity tend to lag behind real estate transfers." (*ibid.*, p. 130).

³⁴ There was a definite increase in home ownership for the period 1920 to 1930.

changing the debt assumed could be utilized to partially minimize booms and depressions in real estate and to some extent the extreme business depressions and prosperities where the phases concur with that of the real estate cycle.

The more the debt assumed becomes standardized, i. e., as to terms and conditions of lending, and flexed conversely to the real estate cycle, and also the greater the shift to institutional and to more recent governmental lending agencies, the more likely are the foregoing objectives to be approached. These aims would be more realizable if a real estate mortgage bank or some such a super bank were inaugurated with a set-up similar to the Federal Reserve System and with the power to enforce credit terms and yet adaptable to local conditions.

Much could be accomplished by desirable educational and publicity efforts, not only by making local occupance surveys,³⁵ but also by enlarging the scope of such surveys, publishing the results, and publicising the specific implications to the realtors, mortgage financiers, owners, investors, and renters. Local, regional, and national real estate boards in cooperation with "disinterested" business research bureaus of universities or the like and the United States Department of Commerce and other comparable divisions of the various governmental units, could make continually complete real estate analyses. To insure a readier market with a greater price flexibility, it might be desirable to have a central listing bureau, possibly in connection with the local real estate boards. At present, prices depend too much on relative bargaining ability. If everyone knew or could readily obtain the complete past, present, and probable future aspects and prospects, he should be able to formulate a better prescription for himself. Thus, it would be possible to guide us in part out of these wide amplitudinal swings in real estate, at least in so far as the above factors influence these fluctuations.

³⁵ Riggleman and Frisbee, *op. cit.*, pp. 537 *et seq.*

APPENDIX IA

Summary of City Averages of Cyclical Fluctuations, with their
Average UNIT COST of the Owner-Occupied Dwellings
(20 cycles covered)

City	No. of Cycles	Cyclical Turning Points in the Series	Cyclical Movements					Average Value in Cyclical Phases of Series		
			Duration		Amplitude			Average Value a Year	% of Average Value during Current Cycle	% Rise (+) or Fall (-) from same Phase of Preceding Cycle
			Years	% of Duration of Full Cycle	Standing at Turning Points of Series	Rise (+) or Fall (-)	Rise (+) or Fall (-) a Year			
Cleveland	2	Low			79.1					
		High	13.0	76.4	125.8	+71.0	+7.2	103.9	+46.3	- 4.9
		Low	2.0	23.6	69.4	- 9.7	-5.4	74.2	-45.5	-35.8
Minneapolis	5	Full Cycle	15.0					4.7		+50.0
		Low			84.2					
		High	5.2	70.3	120.4	+36.2	+ 7.7	102.2	- 5.3	- 1.8
Portland	3	Low	2.2	29.7	93.3	-27.1	-12.5	105.7	+ 4.8	+ 1.4
		Full Cycle	7.4					4.7		+23.2
		Low			110.5					
Richmond	4	High	10.5	70.0	137.0	+75.6	+ 7.2	101.8	+18.6	+15.2
		Low	4.5	30.0	61.4	-45.6	-10.8	88.8	-20.2	-26.1
		Full Cycle	15.0					4.6		+39.5
San Diego	5	Low			63.2					
		High	6.5	65.0	135.6	+72.4	+14.1	100.1	-13.1	- 3.2
		Low	3.5	35.0	84.6	-51.0	-14.1	111.1	+11.6	+ 1.5
Syracuse	1	Full Cycle	10.0					3.7		+61.1
		Low			79.5					
		High	4.8	64.9	130.7	+51.2	+26.7	101.4	-11.8	- 2.8
Average of the Six Cities	3.3	Low	2.6	35.1	89.7	-41.0	-24.2	111.5	+11.1	+ 3.2
		Full Cycle	7.4					2.8		+23.7
		Low			78.3					
Average of the Six Cities	3.3	High	11.0	47.8	184.8	+115.2	+10.5	127.9	+73.8	
		Low	12.0	52.2	69.6	- 8.7	-0.7	73.6		
		Full Cycle	23.0					4.6		
Average of the Six Cities	3.3	Low			82.5					
		High	8.5	65.7	139.1	+70.3	+12.2	106.2	+18.1	+ 0.5
		Low	4.5	34.3	78.0	-30.5	-11.3	94.2	- 7.6	-11.2
Average of the Six Cities	3.3	Full Cycle	13.0					4.2		39.5

APPENDIX IB

Summary of City Averages of Cyclical Fluctuations, with their
Average PER CENT DEBT Assumed of the Owner-Occupied
Dwellings (17 cycles covered)

City	No. of Cycles	Cyclical Turning Points in the Series	Cyclical Movements					Average Value in Cyclical Phases of Series		
			Duration			Amplitude		Average Value a Year	% of Average Value during Current Cycle	% Rise (+) or Fall (-) from same Phase of Preceding Cycle
			Years	% of Duration of Full Cycle	Standing at Turning Points of Series	Rise (+) or Fall (-)	Rise (+) or Fall (-) a Year			
Cleveland	2	High			93.5					
		Low	3.5	23.5	74.0	-25.6	- 7.0	85.0	-31.1	-29.
		High	13.0	71.5	103.5	+43.7	+ 4.4	96.8	+18.0	+ 5.
		Full Cycle	16.5					34.9		+48.
Minneapolis	3	High			88.4					
		Low	2.7	22.5	65.3	-23.1	- 5.9	83.5	-20.3	-11.
		High	9.3	77.5	130.2	+65.0	+11.3	100.5	+22.0	+ 4.
		Full Cycle	12.0					35.7		+51.
Portland	3	High			113.7					
		Low	5.7	55.1	55.0	-59.7	-10.7	82.2	-18.9	+ 2.
		High	7.0	44.9	162.0	+107.0	+24.5	110.4	-39.7	- 5.
		Full Cycle	12.7					26.2		+32.
Richmond	4	High			56.5					
		Low	2.5	27.8	96.0	-36.6	-13.3	115.0	+28.5	+ 1.
		High	6.5	72.2	132.6	+76.1	+24.8	94.5	- 8.4	+13.
		Full Cycle	9.0					36.5		+20.
San Diego	2	High			134.6					
		Low	3.5	31.8	43.9	-100.8	-91.4	88.6	-36.4	-55.
		High	11.5	68.2	149.0	+105.1	+11.0	100.4	+40.8	+34.
		Full Cycle	14.5					25.0		+92.
Syracuse	3	High			117.7					
		Low	3.6	35.1	77.2	-40.5	-10.2	95.0	- 6.1	- 2.1
		High	7.7	64.9	122.9	+44.2	+ 8.8	99.3	+ 4.9	+ 2.1
		Full Cycle	11.3					48.2		+17.
Average of the Six Cities	3	High			100.7					
		Low	3.6	32.6	68.6	-47.7	-23.1	91.0	-14.1	-16.
		High	9.1	66.4	133.4	+73.5	+14.1	100.3	+19.5	+ 9.
		Full Cycle	12.7					34.1		43.8

APPENDIX IIA

Summary of City Averages of SPECIFIC-CYCLE Patterns
Averages of Specific-Cycle Relatives at Five Stages of the Cycles
and Changes from Stage to Stage

		Unit	Cost				Per Cent		Debt Assumed			
	Stages	Centered on High or Low	Intervals in Years	Average Standing	Change from Preceding Stage	Average Change a Year from Preceding Stage	Centered on High or Low	Intervals in Years	Average Standing	Change from Preceding Stage	Average Change a Year	
and	I	Low	2.0	79.2	+12.9	+6.5	Low	2.5	93.5	+12.1	-	
	II		1.0	91.2	+12.0	+12.0		1.75	86.7	-6.6	-	
	III		1.0	72.6	-18.6	-18.6		1.75	73.0	-14.2	-	
	IV		6.5	98.9	+26.4	+4.1		6.5	100.9	+27.9	-	
	V		6.5	140.4	+41.5	+6.4		6.5	116.7	+15.8	-	
apolis	I	High	0.6	80.0	-7.5	-12.5	Low	2.8	112.2	+40.7	-	
	II		2.4	104.5	+16.1	+6.7		1.3	88.8	-23.4	-	
	III		2.4	120.4	+15.9	+6.6		1.3	65.3	-23.5	-	
	IV		0.9	102.8	-17.2	-19.1		4.7	97.5	+32.2	-	
	V		0.9	93.3	-9.5	-10.6		4.7	130.0	+32.4	-	
nd	I	Low	5.0	110.5	+24.9	+5.0	Low	1.5	114.7	+43.5	-	
	II		2.25	93.9	+16.7	-7.4		2.8	69.6	-45.1	-	
	III		2.25	61.4	-27.5	-12.2		2.8	55.0	-14.6	-	
	IV		5.25	100.6	+39.2	+7.5		3.8	113.6	+58.6	-	
	V		5.25	137.0	+36.4	+6.9		3.8	162.0	+49.7	-	
hond	I	High	1.7	63.2	-27.4	-16.1	High	1.5	56.5	-24.3	-	
	II		3.3	99.7	+36.5	+11.1		3.3	92.4	+35.9	-	
	III		3.3	135.6	+35.9	+10.9		3.3	132.6	+40.2	-	
	IV		1.8	111.8	-23.8	-13.2		1.3	114.6	-18.0	-	
	V		1.8	84.7	-27.2	-15.1		1.3	96.2	-18.4	-	
Diego	I	High	1.0	79.5	-24.5	-24.5	Low	3.0	134.6	+44.9	-	
	II		2.4	98.7	+19.2	+8.0		1.8	88.4	-46.3	-	
	III		2.4	130.7	+32.0	+13.3		1.8	43.9	-44.5	-	
	IV		1.3	114.8	-15.9	-12.2		5.5	105.8	+61.4	-	
	V		1.3	89.7	-25.1	-19.3		5.5	149.0	+43.3	-	
use	I	Low		78.3			Low	2.25	117.7	+26.2	-	
	II		6.0	70.3	-8.0	-1.3		1.8	93.6	-24.2	-	
	III		6.0	69.6	-0.7	-0.1		1.8	77.2	-16.3	-	
	IV		5.5	122.3	+52.7	+9.6		3.8	98.5	+21.3	-	
	V		5.5	184.8	+62.5	+13.6		3.8	122.2	+23.7	-	
ge he ities	I	High	2.1	71.1	-16.1	-7.7	Low	2.3	104.9	-24.5	-	
	II		4.2	104.2	+33.1	+7.9		2.1	91.1	-13.8	-	
	III		4.2	141.5	+37.3	+8.9		2.1	74.5	-16.6	-	
	IV		2.4	99.6	-41.9	-1.7		4.3	105.2	+30.7	-	
	V		2.4	87.2	-12.4	-5.2		4.3	129.4	+24.2	-	

APPENDIX IIB

Summary of City Averages of REFERENCE-CYCLE Patterns
Averages of Reference-Cycle Relatives at Five Stages of the Cycles
and Changes from Stage to Stage

City	Stages	Unit			Cost		Per Cent		Debt Assumed		
		Centered on High or Low	Intervals in Years	Average Standing	Change from Preceding Stage	Average Change a Year from Preceding Stage	Centered on High or Low	Intervals in Years	Average Standing	Change from Preceding Stage	
Cleveland	I	High	2.7	97.1	+ 9.2	+ 3.3	High	2.7	104.8	+13.8	
	II		2.8	109.7	+12.6	+ 3.9		2.8	108.2	+ 3.4	
	III		2.8	126.0				2.8	103.9		
	IV			89.6	+16.3	+ 5.8			84.5	- 4.3	
	V		2.9	95.5	+ 5.9	+ 2.0		2.9	94.9	+11.4	
Minneapolis	I	High	2.9	93.2	- 2.3	- 0.8	High	2.9	103.9	+ 9.0	
	II		2.7	102.2	+16.3	+ 6.1		2.7	99.7	+ 5.2	
	III		2.8	107.6	+ 5.4	+ 1.9		2.8	99.3	- 0.5	
	IV		2.8	108.8				2.8	122.7		
	V			85.7	+ 1.2	+ 0.3			94.8	+23.5	
Portland	I	High	2.9	94.0	+ 8.3	+ 3.4	High	2.9	97.7	+ 2.9	
	II		2.9	95.0	+ 1.0	+ 0.3		2.9	88.0	- 9.6	
	III		2.7	100.9	+ 6.6	+ 2.4		2.8	87.8	-15.6	
	IV		2.8	102.2	- 1.3	- 0.5		3.0	107.7	+19.9	
	V		2.8	119.6				3.0	131.2		
Richmond	I	High		90.9	+14.0	+ 6.1	Low		70.7	+18.6	
	II		2.9	97.5	+ 6.6	+ 2.3		3.0	106.2	+35.5	
	III		2.9	94.5	- 3.1	- 1.1		3.0	109.3	+ 3.1	
	IV		2.7	93.2	- 6.1	- 2.3		2.7	71.4	-10.0	
	V		2.8	105.4	+12.2	+ 3.5		2.8	102.6	+31.4	
San Diego	I	High	2.8	132.0			High	2.8	82.6	-23.2	
	II			88.8	+26.6	+10.0					
	III		2.9	103.2	+ 1.3	+ 0.4		2.9	109.7	+27.1	
	IV		2.9	90.5	-12.7	- 4.1		2.9	106.3	- 3.4	
	V		2.7	91.4	+ 7.6	+ 3.0		2.7	64.5	- 4.4	
Syracuse	I	High	2.8	86.7	- 4.7	- 2.0	High	2.8	117.5	+53.0	
	II		2.8	97.3	+10.7	+ 3.5		2.8	136.5		
	III								119.3	+19.0	
	IV		2.9	113.8	+11.8	+ 4.4		2.9	84.5	-34.8	
	V		2.9	108.0	- 5.8	- 1.1		2.9	88.3	+ 3.8	
Worcester	I	High	2.7	100.5	+14.4	+ 6.6	High	2.7	69.9	-47.9	
	II		2.8	100.4	- 0.1	- 0.04		2.8	86.4	+16.5	
	III		2.8	133.6				2.8	113.9		
	IV			93.6	+27.3	+ 9.6			104.8	+27.5	
	V		2.9	91.1	- 2.5	- 0.9		2.9	115.7	+10.9	
Average of the Cities	I	High	2.9	96.4	+ 5.5	+ 1.9	High	2.9	80.6	-35.1	
	II		2.7	97.6	+ 8.0	+ 3.0		2.7	83.0	- 9.8	
	III		2.8	102.0	+ 4.0	+ 1.4		2.8	103.6	+20.6	
	IV		2.8	119.6				2.8	115.1		
	V			90.0	+16.0	+ 5.7			92.8	+10.2	
	I		2.9	99.2	+ 5.2	+ 1.8		2.9	101.5	+ 8.8	
	II		2.9	96.3	- 2.9	- 1.0		2.9	96.1	- 5.4	

Summary: Measures of Conformity to Reference Cycles
Averages of the Six Cities 1892-1932

Average change of reference-cycle relatives
during stages associated with

Average change
for reference
expansion sub-
tracted from
average change
for reference
contraction

[illegible]