CHAPTER 4

CYCLES IN MAJOR TYPES OF INCOME

Timing of Turning Points

As in our analysis of trends in personal income, we shall distinguish net income of farm operators, farm wages and salaries, nonfarm labor income, property income, and net income of nonfarm proprietors. We shall look first for differences in the timing of turning points. Ordinarily this calls for the use of monthly data, which restricts our time periods to 1929-1950 (Chart 6 and Table 4). In the case of farm income, however, annual data are perhaps to be preferred, since, in many branches of farming, net income cannot be estimated within a tolerable margin of error except on an annual basis. The use of annual data for this type of income makes possible the analysis of a much longer period.

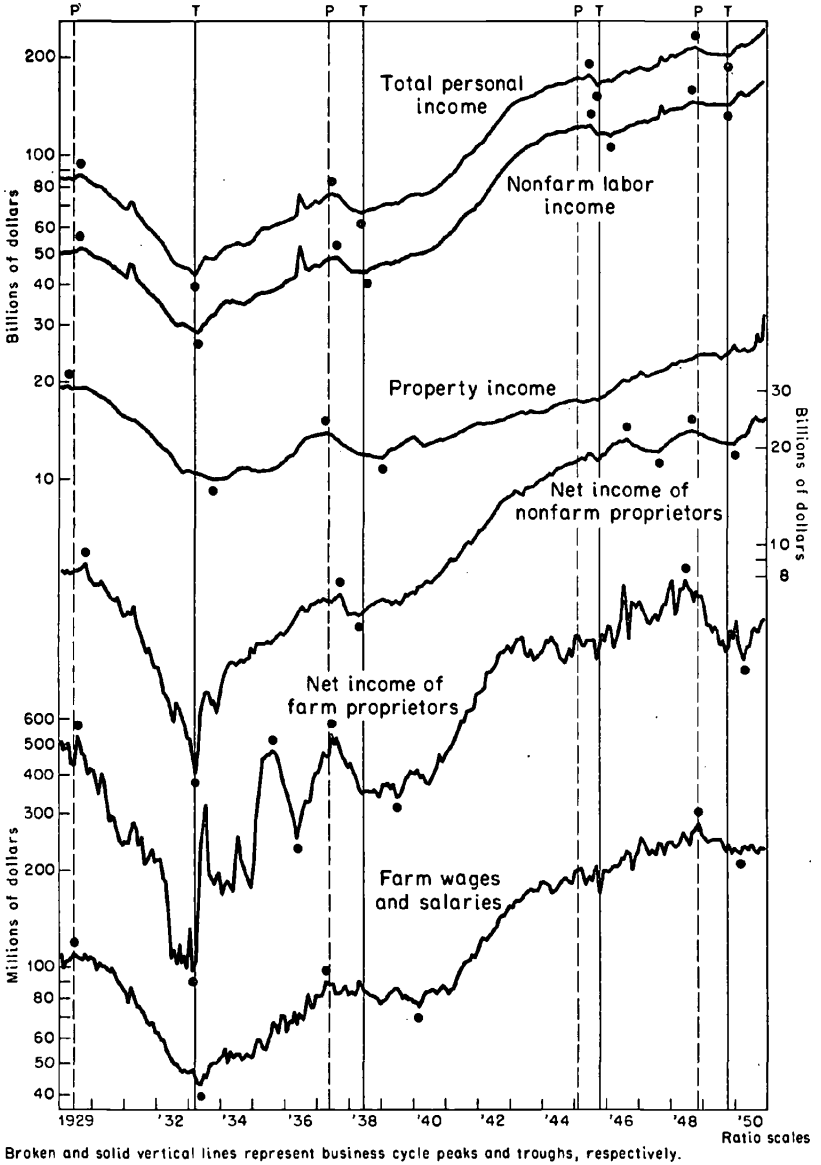
Farm income fluctuates somewhat irregularly, as one would expect of an industry whose fortunes are greatly affected by the vagaries of the weather. For example, between 1933 and 1937 the "dust bowl" drought created an extra cycle in farm income, not paralleled by one in general business. But the corresponding monthly turns in farm income and business cycles in 1929, 1933, and 1937 were virtually synchronous. Thereafter, there were substantial differences in their timing: farm income lagged a year behind the business cycle trough in 1938 and six months behind the trough in 1949; it turned down five months before the peak in 1948; and it failed to contract with general business during the 1945-1946 demobilization.

Since the net income of farm operators dominates the farm income total, it is not surprising that the two have identical turning points. Wages paid to hired farm workers, however, did not trace an extra cycle in the mid-1930's, although they, too, failed to turn downward during the period of military demobilization. The differences in timing at corresponding turns do not appear to be particularly significant.

The extent of the congruent movement in the net income of farm operators and general business may be measured by indexes of conformity. We score +100 for every expansion in general business in which net income of farm operators rises and −100 when it declines. The algebraic sum of these scores divided by the number of expansions covered is the index of conformity to expansions in general business. The index may vary from +100, signifying perfect

CHART 6

Personal Income in Current Prices by Type of Income,
Monthly Data, 1929-1950



Broken and solid vertical lines represent business cycle peaks and troughs, respectively.

Source: See note to Table 4. All data are seasonally adjusted and, except for the bottom two series, are at annual rates.

TABLE 4

Lead (−) or Lag (+) of Personal Income and of Its Major Components at Business Cycle Turning Points, 1929-1949

(*months*)

	P *June 1929*	T *Mar. 1933*	P *May 1937*	T *June 1938*	P *Feb. 1945*	T *Oct. 1945*	P *Nov. 1948*	T *Oct. 1949*
Total personal income	+2	0	+1	−1	+4	−1	−1	0
Farm income[a]	+1	−1	+1	+12			−5	+6
Proprietors' net income[a]	+1	−1	+1	+12			−5	+6
Wages and salaries	0	+2	−1	+20			0	+4
Nonfarm labor income	+2	+1	+3	−1	+5	+4	−2	0
Nonfarm proprietors' net income[b]	+4	0	+4	−2			−3	+2
Property income	−2	+7	−1	+7				

[a] A noncorresponding peak occurred in August 1935 and a noncorresponding trough in May 1936.

[b] A noncorresponding peak occurred in August 1946 and a noncorresponding trough in August 1947.

P = peak; T = trough.

Source: Business cycle turns are those in the National Bureau of Economic Research business cycle chronology; personal income turns are based on published and unpublished estimates in current prices of the National Income Division, Department of Commerce.

positive conformity, to −100, signifying perfect inverse conformity. Conformity to contractions in general business is measured similarly, +100 being scored for a decline in the net income of farm operators during a contraction in general business and −100 for a rise. A third index, full cycle conformity, measures the frequency with which the rate of change per month during a contraction in general business is algebraically lower than the rate of change during the preceding and following expansions in general business; +100 means there have been no exceptions.[1]

Our indexes indicate a high degree of cyclical conformity between farm operators' net income and general business during the two decades 1929-1949, with indexes of +100, +50, and +100, respectively, for expansions, contractions, and full cycles in general business. The lapse from perfect conformity to business contractions is due to the failure of farm income to decline in 1945. No doubt this high conformity is the result, at least in part, of the unusually

[1] For a fuller discussion of indexes of conformity see Arthur F. Burns and Wesley C. Mitchell's *Measuring Business Cycles* (National Bureau of Economic Research, 1946, pp. 31-33).

large amplitudes of the business cycle movements of the 1930's and 1940's.

The high conformity evident in recent years is not found in earlier decades. By using estimates on an annual basis we can view farm operators' net income back to 1909, and by reference to a kindred series, gross income of farm operators back to 1869 (Chart 7 and Table 5). Since for overlapping years most of the turning points are identical for both series, and since there is a one-to-one correspondence in the specific cycles of the two series, we have analyzed the longer series, gross farm income.

In all decades from 1870 to 1930 there is evidence that the factors that cause cycles in farm income frequently operate independently of factors that cause cycles in general business. Thus in the middle 1870's there was a cycle in farm income that had no counterpart in general business. In the next decade the business cycle trough of 1888 coincided with a peak in farm income, and similar inversions of turning points occurred in 1891 and 1892. Another sign of independent movement is skipped cycles: between 1896 and 1911, general business traced four cycles and farm income only one. Cycles were skipped also in the early and middle 1920's. Low conformity is indicated by the conformity indexes: +50, +6, and +25, respectively, for expansions, contractions, and full cycles in general business.

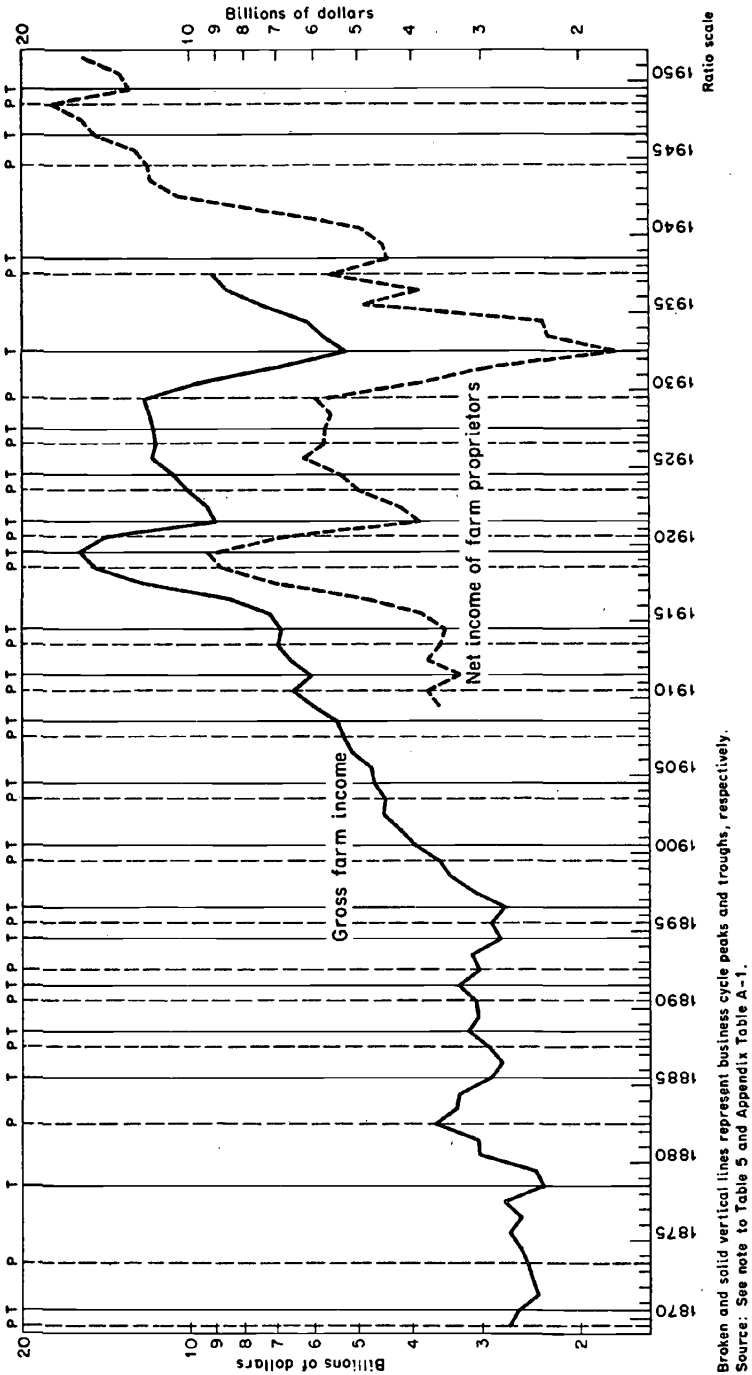
Note that the conformity index for farm income is significantly higher in the expansion phase of the business cycle than in the contraction phase. This might be because the influence of business conditions on agricultural income is more apparent in business expansions than in contractions, particularly when annual data are used, since the expansion phases have usually been longer than contractions. The upward trend in farm income over the decades also is conducive to such a result.

While the low conformity indexes indicate a lack of regularity in the relations between cyclical movements in the agricultural sector and in general business, and do not reveal in which direction the relations have run, no doubt there have been occasions when changes in farm income have had a significant influence on the course of business cycles, as well as vice versa. The agricultural sector apparently helped to lift the entire economy out of several depressions in the latter half of the nineteenth century.[2] Crop failures abroad

[2] See, for example, Wesley C. Mitchell's interpretation of the business contractions of 1873-1878, 1890-1891, and 1895-1896 in his *Business Cycles* (Uni-

CHART 7

Gross Farm Income, 1869-1937, and Farm Proprietors' Net Income, 1909-1951



Broken and solid vertical lines represent business cycle peaks and troughs, respectively.
Source: See note to Table 5 and Appendix Table A-1.

TABLE 5

Turning Points in Business Activity and in Gross Farm Income, 1869-1929

	Business Activity	*Gross Farm Income*		*Business Activity*	*Gross Farm Income*		*Business Activity*	*Gross Farm Income*
1869	P		1890	P		1910	P	P
1870	T		1891	T	P	1911	T	T
1871		T	1892	P	T	1912		
1872			1893		P	1913	P	P
1873	P		1894	T	T	1914	T	T
1874			1895	P	P	1915		
1875		P	1896	T	T	1916		
1876		T	1897			1917		
1877		P	1898			1918	P	
1878	T	T	1899	P		1919	T	P
1879			1900	T		1920	P	
1880			1901			1921	T	T
1881			1902			1922		
1882	P	P	1903	P		1923	P	
1883			1904	T		1924	T	
1884			1905			1925		P
1885	T		1906			1926	P	T
1886		T	1907	P		1927	T	
1887	P		1908	T		1928		
1888	T	P	1909			1929	P	P
1889		T						

P = peak; T = trough.

Source: Business cycle turns are those in the National Bureau of Economic Research business cycle chronology; gross farm income turns are based on estimates of gross farm income including "omitted products," adjusted for change in inventory values of meat animals, in F. Strauss and L. H. Bean, *Gross Farm Income and Indices of Farm Production and Prices in the United States, 1869-1937*, Dept. of Agriculture, Technical Bulletin 703, December 1940, Table 8, p. 24.

and large harvests at home brought an extraordinary measure of prosperity to farmers in the United States, which, in due course, permeated the other sectors of the economy. Agriculture, of course, assumes more importance in our economy as we go back in our history. In 1870, for example, half of our total manpower was in agriculture; in 1900, agriculture accounted for only about a third of all manpower and thirty years later for slightly more than a fifth.[3] Agricul-

versity of California Press, 1913, pp. 45, 51, and 60) and *What Happens during Business Cycles: A Progress Report* (National Bureau of Economic Research, 1951, p. 58).

[3] Daniel Carson, "Changes in the Industrial Composition of Manpower since

tural income now accounts for only about one-tenth of total personal income; hence its influence on general business is much less than it was eighty years ago. The high conformity of agricultural income to business cycles in recent decades must largely reflect the influence of business cycles on the demand for farm products.

While farm income follows a more independent course, labor income (nonfarm) mirrors the ebb and flow of general business. The cycles of nonfarm labor income were in one-to-one correspondence with business cycles in the two decades following 1929. Short lags predominated—five out of eight turns—and at the other turns there were one coincidence and two leads not exceeding two months (Table 4).

During the 1930's the net income of nonfarm proprietors lagged four months behind the business cycle at each of the two peaks and either coincided with it or led by two months at the troughs. In the brief postwar period the timing has been reversed: nonfarm proprietors' income led the 1948 peak in general business by three months and lagged two months behind at the next trough.[4] However, one cannot place much confidence in these observations, since the estimates of this type of income are subject to large errors on account of the dearth of data.

Property income between 1929 and 1939 led the business cycle at peaks and lagged at troughs. Equally notable is the fact that since January 1939, property income has expanded continuously, unaffected by the business contraction accompanying the brief period of demobilization. The business contraction of 1948-1949 is reflected only in a slackening of the rate of expansion in property income.

As is true of total personal income, no component systematically leads the turns in business cycles, except possibly property income at peaks. Moreover, the few leads have been short. The more typical relationship is either coincidence or a brief lag.

Amplitude of Cyclical Fluctuations

In this section we shall use as common reference cycles the five cycles in total personal income traced by annual data from 1909 to 1951. We shall measure the amplitude of expansion, of contraction,

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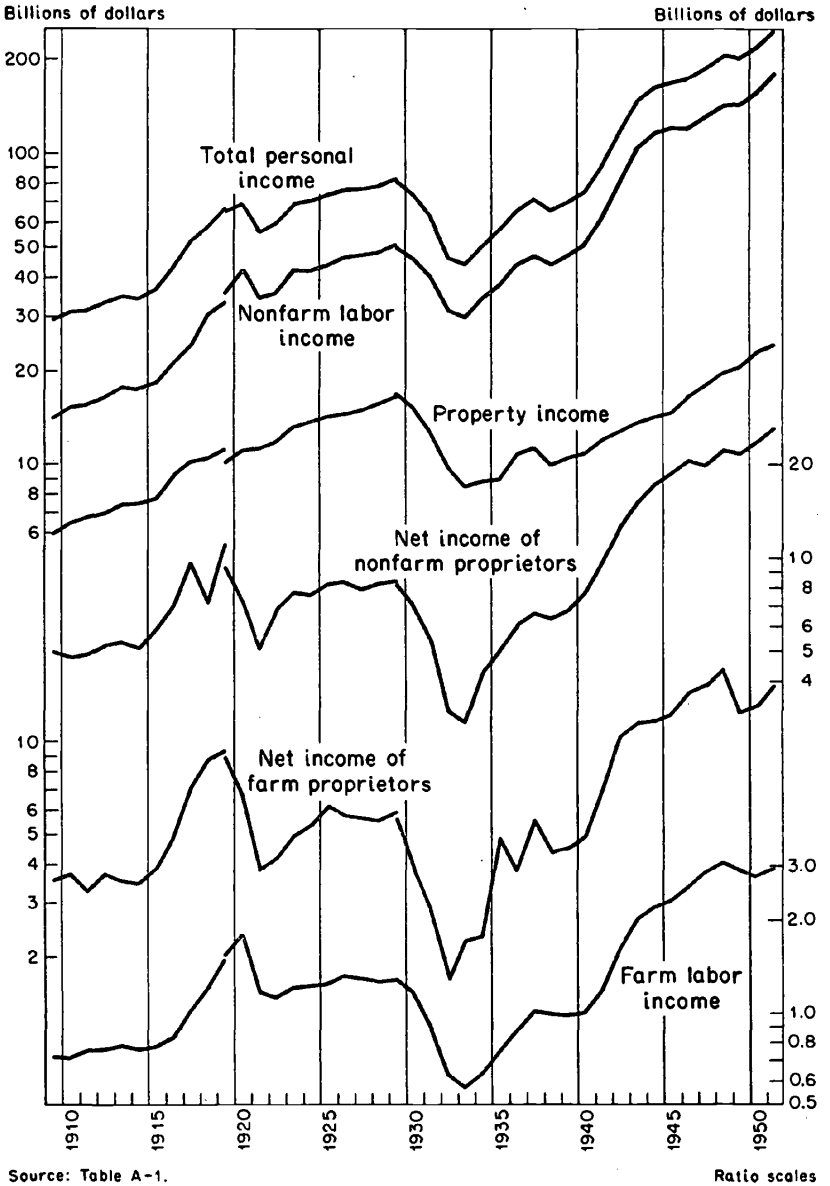
the Civil War," *Studies in Income and Wealth, Volume Eleven*, National Bureau of Economic Research, 1949, p. 47.

[4] We should note also a peak in August 1946 and a trough in August 1947, neither of which can be construed as corresponding to business cycle turning points.

and of the full cycle in various types of income during the periods defined by the turning points in total personal income (Chart 8 and Table 6).

CHART 8

Personal Income in Current Prices by Type of Income, Annual Data, 1909-1951



CYCLES IN MAJOR TYPES OF INCOME

Let us first observe, for each major type of income, the average full cycle amplitude (the total movement during expansion and contraction after reversing the sign of the latter) over the five cycles. The largest amplitude occurs in the net income of farm operators:

	All Cycles	*Excluding War Cycles*
Net income of farm proprietors	101	78
Net income of nonfarm proprietors	80	67
Farm wages and salaries	78	48
Nonfarm wages and salaries	74	55
Property income	55	56
Transfer payments and other labor income	49	2
Total personal income	73	56

When we exclude from the averages the two cycles 1914-1921 and 1938-1948, which include wars, the amplitude of all types except property income is reduced. The reduction is particularly marked in transfer payments and other labor income, because in both war expansions the rise in this type of income exceeded that of all other types, whereas in peacetime its cyclical changes have usually been relatively small.

Of equal significance is the average amplitude of expansion compared with the average amplitude of contraction (Table 6). For each of the three primary types of income the rise was substantially larger than the fall. This was true not only on the average but in every cycle of personal income except the one encompassing the Great Depression. This excess of expansion over contraction is in keeping, of course, with the rising secular trend in personal income. Table 6 also shows that nonfarm labor income had the largest average net rise (algebraic sum of the amplitudes of expansion and contraction) over the period, exceeding the net rise in property income (the next largest) in four of the five cycles.

Finally, we must note the continuous expansion in transfer payments and other labor income. In each of the five contractions in personal income these supplementary payments continued to rise. The largest increases occurred during the expansions that included war and a postwar transition. In 1921-1938 these payments moved countercyclically in the sense that they rose at a more rapid rate during the contractions than during the expansions; during this period they were dominated by relief payments.

TABLE 6

Amplitude of Personal Income and of Its Major Components during Five Cycles in Personal Income, 1909-1949
(*based on cycle relatives*)

PERSONAL INCOME CYCLE *Phase*	*Period*	TOTAL PERSONAL INCOME	LABOR INCOME: *Wages and Salaries* *Farm*	*Wages and Salaries* *Nonfarm*	LABOR INCOME: *Other Labor Income and Transfer Payments*	PROPRIETORS' NET INCOME *Farm*	PROPRIETORS' NET INCOME *Nonfarm*	PROPERTY INCOME
Expansion	1909-1913	+16.7	+8.2	+22.2	+21.6	−.7	+7.3	+20.9
Contraction	1913-1914	−1.8	−3.0	−1.7	+1.1	−1.5	−5.1	+.3
Full cycle		+18.5	+11.2	+23.9	+20.5	+.8	+12.4	+20.6
Net change over cycle		+14.9	+5.2	+20.5	+22.7	−2.2	+2.2	+21.2
Expansion	1914-1920	+67.2	+86.7	+78.6	+118.8	+56.6	+45.0	+48.0
Contraction	1920-1921	−25.5	−53.2	−26.7	+9.6	−48.3	−33.0	+1.7
Full cycle		+92.7	+139.9	+105.3	+109.2	+104.9	+78.0	+46.3
Net change over cycle		+41.7	+33.5	+51.9	+128.4	+8.3	+12.0	+49.7
Expansion	1921-1929	+40.2	+11.0	+39.7	+12.4	+45.0	+48.5	+40.6
Contraction	1929-1933	−56.2	−61.5	−51.3	+26.7	−76.0	−70.8	−61.9
Full cycle		+96.4	+72.5	+91.0	−14.3	+121.0	+119.3	+102.5
Net change over cycle		−16.0	−50.5	−11.6	+39.1	−31.0	−22.3	−21.3
Expansion	1933-1937	+45.3	+54.9	+43.2	+21.8	+82.9	+59.5	+29.6
Contraction	1937-1938	−9.1	−4.0	−8.2	+22.4	−29.7	−9.8	−14.6
Full cycle		+54.4	+58.9	+51.4	−.6	+112.6	+69.3	+44.2
Net change over cycle		+36.2	+50.9	+35.0	+44.2	+53.2	+49.7	+15.0

TABLE 6 (continued)

(*based on cycle relatives*)

PERSONAL INCOME CYCLE *Phase*	*Period*	TOTAL PERSONAL INCOME	LABOR INCOME: *Wages and Salaries* *Farm*	LABOR INCOME: *Wages and Salaries* *Nonfarm*	LABOR INCOME: *Other Labor Income and Transfer Payments*	PROPRIETORS' NET INCOME *Farm*	PROPRIETORS' NET INCOME *Nonfarm*	PROPERTY INCOME
Expansion	1938-1948	+99.6	+103.0	+97.0	+150.3	+121.7	+106.6	+68.4
Contraction	1948-1949	−2.8	−5.6	−.9	+18.1	−42.6	−14.4	+5.7
Full cycle		+102.4	+108.6	+97.9	+132.2	+164.3	+121.0	+62.7
Net change over cycle		+96.8	+97.4	+96.1	+168.4	+79.1	+92.2	+74.1
Average, all cycles								
Expansion		+53.8	+52.8	+56.1	+65.0	+61.1	+53.4	+41.5
Contraction		−19.1	−25.5	−17.8	+15.6	−39.6	−26.6	−13.8
Full cycle		+72.9	+78.3	+73.9	+49.4	+100.7	+80.0	+55.3
Net change over cycle		+34.7	+27.3	+38.3	+80.6	+21.5	+26.8	+27.7
Average excluding war cycles, 1914-1921 and 1938-1949								
Expansion		+34.1	+24.7	+35.0	+18.6	+42.4	+38.4	+30.4
Contraction		−22.4	−22.8	−20.4	+16.7	−35.7	−28.6	−25.4
Full cycle		+56.5	+47.5	+55.4	+1.9	+78.1	+67.0	+55.8
Net change over cycle		+11.7	+1.9	+14.6	+35.3	+6.7	+9.8	+5.0

Source: Based on Table A-1. The reference cycles are cycles in personal income in current prices.