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World Imports and United States Business Cycles

We have established (Chapter 4) that U.S. exports conformed perfectly to cycles in world trade over the full period covered. We have found (Chapter 3) that they also conformed with a high degree of regularity to U.S. business cycles in 1921-58, but not in 1879-1913. Hence it seems probable that the relation of world trade cycles to U.S. business cycles also shifted after World War I and that this accounts for the shift in exports. To test this hypothesis, we shall now examine the relation of world trade to domestic business cycles.

The roughest first approach to this question is to count the number of quarters in which the imports of the world excluding the United States and U.S. business were in unlike cyclical phase. Table 9 shows that before

TABLE 9

Percentage of Quarters in Unlike Cycle Phase: Domestic Business and World Imports, 1883-1957

	1883/II-1913/III	1921/III-1938/IV	1921/III-1938/IV[a]	1948/IV-1957/II	1921/III-1957/II
Total number of quarters	121	69	61	34	103
Number of quarters in unlike phase	49	27	19	10	37
Percentage of quarters in unlike cycle phase	40.5	39.1	31.1	29.4	35.9

World imports exclude U.S. imports.
See Table 1, notes 1-2.
[a] Excluding 1933-34.

World War I the relation was hardly better than a chance association. In 60 per cent of all quarters world trade and United States business cycles were in phase, while in the other 40 per cent a world trade upswing was accompanied by a business downswing or vice versa. Contrary to our hypothesis, the situation in the interwar period appears similar. In part, however, the high percentage in the latter period is due to eight consecutive quarters of opposite movements in 1933-34, when the United States economy recovered while world imports showed further deterioration. If these two years are excluded, the percentage of quarters in unlike phase drops to 31 and a similar figure is obtained for 1948-57. Even if the lower figure is accepted as characteristic for the interwar period, however, the contrast to the early period is not sharp enough to be clearly significant and certainly not severe enough to account for the shift in export patterns.[1]

The next step in dealing with the problem is to compare the timing of turns in world trade and in domestic business. A shift from poor to close correspondence between these turns after World War I would indicate a shift in the relation of world trade and business cycles. In Table 10, however, there is no clear evidence of such a shift. In the earlier period nine out of nineteen domestic turns were not associated with world turns, in the later period six out of fifteen. Conversely, of the thirteen turns in world trade in each period, three were not related to business turns before and four after World War I. On the other hand, there is one aspect of the timing which suggests a closer association in the later period: the absence of such long lags of world trade at later business peaks as had occurred at three of the earlier ones. The five peaks in domestic business which started the more severe contractions after World War I were all associated with simultaneous or nearly simultaneous downturns in world trade.[2] When we go back in time, we find the same kind of association in 1913 and 1907. But before that time even major reversals in American business were not associated with those in world trade, or at least there was a long lag before world trade followed suit. Thus,

[1] It is quite interesting to compare the figures in Table 9 to some of Morgenstern's corresponding measures which are, however, based on monthly chronologies, September 1879 to August 1914 and June 1919 to September 1938. Such a comparison shows, for instance, that American business cycles moved opposite to world trade before World War I about as frequently as they moved opposite to French (39 per cent of months) or German (38 per cent of months) business cycles. Disagreement between American and British business cycles (35 per cent of months) was somewhat less frequent than between American and world trade cycles in the period before World War I. In the interwar period the former percentage declined to 29. (Oskar Morgenstern, *International Financial Transactions and Business Cycles,* Princeton for NBER, 1959, p. 49.)

[2] But note that there is no significant correlation between the severity of contractions in business and world trade (see p. 40).

TABLE 10

Lead (−) or Lag (+) of World Imports at Turns in U.S. Business Cycles, 1882-1957

Turns in U.S. Business (year and quarter) Peaks	Troughs	*Number of Quarters* Peaks	Troughs
1882 I		+5	
	1885 II		+3
1887 II		[a]	
	1888 I		[a]
1890 III		[a]	
	1891 II		[a]
1893 I		[a]	
	1894 II		+3
1895 IV		[a]	
	1897 II		[a]
1899 III		+3	
	1900 IV		+4
1902 IV		+4	
	1904 III		−1
1907 II		+1	
	1908 II		0
1910 I		[a]	
	1911 IV		[a]
1913 I		+2	
1920 I		+1	
	1921 III		+1
1923 II		[a]	
	1924 III		[a]
1926 III		[a]	
	1927 IV		[a]
1929 III		−1	
	1933 I		+8
1937 II		0	
	1938 II		+2
1948 IV		0	
	1949 IV		+1
1953 II		[a]	
	1954 III		[a]
1957 III		−1	

3 additional world import turns, 1882-1913, and 4 world import turns, 1920-57, do not correspond to turns in U.S. business.

World imports exclude U.S. imports.

See Table 1, notes 1-2.

[a] No corresponding turn.

although timing comparisons provide no evidence of a radical shift in the relation of world trade to domestic business cycles, they do point to a closer relation at business peaks in the later period. This agrees with the results of the comparison of phase correspondence.

The third step is to analyze the movements of world imports in the framework of United States business cycles by the standard National Bureau method. In this way the direction of movement of the series can be evaluated much better than by the mere count of like and unlike movements presented above, and the amplitude of movements is also taken into account. Furthermore, this technique enables us to compare changes in world trade directly with those in U.S. exports analyzed in the same fashion.

To find out whether the shift in the relation of exports to business cycles is associated with a similar shift in world trade, we first look at the conformity indexes in Table 11. The columns for the full period, 1882-1958,[3] show similar indexes for both series: +36 for exports and +29 for world imports for full-cycle conformity. World imports rose in thirteen out of fifteen business expansions but also in ten of sixteen business contractions, and their rate of growth in expansions exceeded that in adjoining contractions only eighteen out of twenty-eight times.

Does the similarity of indexes for the two series for the full period imply a similar development of their conformity over time? It does, but to a limited extent only. Comparing the periods before and after World War I, conformity of world imports rises from +18 to +45, against a rise in the conformity of U.S. exports from +6 to +82. Thus world imports conformed a little better than U.S. exports to business cycles before World War I and substantially less well in the later period. But this is not the main difference. When we look more closely at the later period and distinguish the interwar from the most recent years, we find that the conformity of world imports in the interwar period was even lower than before World War I (+14), while U.S. exports in those years conformed perfectly. From 1948 to 1958, however, it was world imports which conformed perfectly while U.S. exports rose more rapidly in the 1953-54 recession than in the preceding expansion. This appears to conflict with the view that a major part of the shift in export conformity can be attributed to similar developments in world trade.

However, this conclusion overstates the contrast in the development of

[3] Lack of world import data forces us to exclude the expansions of 1879-82 and 1945-48 from this comparison. Hence measures of average export changes in this and the following chapters differ from those in Chapter 3 where all available information was used.

TABLE 11

Domestic Business Cycles: Average Change in World Imports Compared to U.S. Exports, 1882-1958

	1882-1913		1921-38		1948-58		1921-38 1948-58		1882-1913 1921-38 1948-58	
	U.S. Exports	World Imports	U.S. Exports	World Imports	U.S. Exports	World Imports	U.S. Exports	World Imports	U.S. Exports	World Imports
Number of expansions	9	9	3	3	2	2	5	5	14	14
Number of contractions	9	9	3	3	3	3	6	6	15	15
Conformity index										
Expansion	+33	+56	+100	+100	+100	+100	+100	+100	+60	+73
Contraction	−11	−56	+100	0	+33	+33	+71	+14	+25	−25
Full cycle	+6	+18	+100	+14	+50	+100	+82	+45	+36	+29
Average total percentage change										
Expansion	+7.6	+7.9	+12.5	+12.0	+25.6	+28.3	+17.8	+18.5	+11.2	+11.7
Contraction	+4.9	+2.9	−4.4	+0.4	−11.2	−6.6	−7.8	−3.1	−0.2	+0.5
Full cycle	2.7	5.0	16.9	11.6	36.8	34.9	25.6	21.6	11.4	11.2
Average annual percentage change										
Expansion	+4.2	+4.0	+7.0	+6.8	+7.9	+8.7	+7.4	+7.9	+5.6	+5.5
Contraction	+3.0	+2.0	−4.0	+0.4	−11.2	−6.6	−7.4	−2.8	−0.1	+0.4
Full cycle	0.8	1.4	6.2	4.0	8.9	8.0	7.4	6.1	3.3	3.2

The conformity index is constructed by rating a rise in expansion or fall in contraction +100, the opposite movements −100, and averaging these ratings. See Appendix B.

The cycle 1929-37 is included in the conformity indexes, but excluded otherwise.

World imports exclude U.S. imports.

See Table 1, notes 1-4.

the two series. Slight differences in relative growth rates of two series occasionally result in widely different conformity indexes when the number of cycles covered is small. That this is our case is shown by comparisons of amplitude measures, which indicate that fluctuations of world imports did actually correspond far better to business cycles in the interwar than in the prewar period although—to this extent the conformity indexes tell the truth—the shift was not as drastic as in U.S. exports. The average annual rate of change of world imports during United States business cycles rose from a low of 1.4 per cent before World War I to 4.0 per cent in the interwar period (excluding 1929-37) and reached 8.0 per cent in the two and a half cycles of 1948-58. This increased variation of world imports during business cycles is due in part to their greater over-all cyclical variability in the later period. But it also reflects the increasingly close association between world import cycles and U.S. business cycles. Before World War I the average annual change of world imports during U.S. business cycles was only about 22 per cent of their total cyclical variation; after World War II it was 59 per cent. For U.S. exports, the comparable ratios of their variation during business cycles to their total cyclical variation were 5 per cent in 1882-1913 and 47 per cent in 1948-58. We conclude that part of the shift in the cyclical behavior of exports may be due to a corresponding shift in world trade; another part, however, reflects shifts in the relation of exports to world trade which were not revealed by the analysis in Chapter 4.

These shifts appear even more clearly when we compare the movements of both series in domestic expansions and contractions. Turning to expansions, first we note the remarkable similarity of U.S. exports and world trade movements in all periods. The average total growth in domestic expansions for 1882-1913 was 7.6 per cent for exports and 7.9 per cent for world trade; for the interwar period excluding 1929-37, the figures are 12.5 and 12.0 per cent; and for the two expansions in 1949-58, they are 25.6 and 28.3 per cent (Table 11). The fate of U.S. exports over a sequence of expansions evidently was closely bound up with the development of world trade. But what about individual expansions? Before World War I the strong similarity of movements holds for every single expansion except that of 1908-10. This can be seen on Chart 2 and measured by the rank correlation of the growth rates of the two series, which gives (excluding 1910) a coefficient of 0.92. After 1921, however, we find no significant correlation between the growth rates of the two series. The similarity of the averages here means that the relatively slow growth of U.S. exports in 1921-23 and 1949-53 was offset by their faster growth in the later expansions in the interwar period and in 1954-57. Export and world trade movements in business contractions do not exhibit as much similarity as in expansions. The average total rise during the business contractions before World War I was far larger in U.S. exports than in world trade (4.9 against 2.9 per cent), while in the contractions after World War I world trade developed more favorably than U.S. exports. In the interwar period (excluding 1929-37), U.S. exports fell 4.4 per cent and world imports rose a little (0.4 per cent). The average decline of exports in the three contractions of 1948-58 was 11.2 per cent and that of world imports 6.6 per cent.

Applying these findings to our search for the causes of the post-World War I shift in the relation of U.S. exports to domestic business cycles, we can draw the following conclusions: We had found before that it was the radical change in the behavior of exports during business contractions (from substantial rise to sharp decline) which brought about the shift in their relation to U.S. business cycles from nonconformity before World War I to conformity afterwards. We now find that this radical change was paralleled by a similar but much milder change in the pattern of world imports (from a rise of roughly 60 per cent of the U.S. export increase to a decline of roughly 40 per cent of the export drop). Part of the shift in U.S. exports may thus be accounted for by this shift in world imports, but another part must be attributed to forces which specially favored U.S. exports in contractions before World War I and to forces which specially depressed them in later contractions.