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Exports and World Imports in Co- and Counter-Phases of Cycles in World Trade and U.S. Business

In this chapter we shall check and supplement the findings of the preceding chapters by studying the *combined* impact of U.S. business cycles and world trade cycles on U.S. exports. Instead of distinguishing *either* between domestic expansions and contractions *or* between world expansions and contractions as before, here we distinguish among the four possible combinations of phases in domestic business and phases in world trade. Periods in which both cycles move in the same direction, we call co-phases; the others, counter-phases. Measures of export movements during such co- and counter-phases enable us to isolate, to a certain extent, the effects of domestic or foreign fluctuations and hence to bring out certain features more clearly than before. One difficulty with this method is that co- and counter-phases are necessarily shorter than full expansions and contractions, and cyclical changes are thus more likely to be obscured by random ones. For this reason, the measures here—in contrast to those in preceding chapters—are based on smoothed series (three-quarter moving averages with double weight on the center quarter).[1] This slight difference in method also has the advantage of providing a check on previous findings.[2]

Measures for all combined phases are given in Tables 14 and 15, but it should be noted that those for world contractions are given largely for

[1] Another way in which this and the standard National Bureau method differ is that percentage changes here are not based on average standings of the series during a cycle, but on average standings during the phase measured.

[2] This technique is used mainly when the series under review is not directly comparable to world imports. See Ilse Mintz, *Trade Balances during Business Cycles: U.S. and Britain since 1880*, Occasional Paper 67, New York, NBER, 1959.

TABLE 14

World *Expansions* and Segments of Domestic Business Cycles: Average Change in U.S. Exports and World Imports, 1881-1958

	Domestic Expansion (co-expansion)			*Domestic Contraction (counter-contraction)*		
	Total	1st Half	2nd Half	Total	1st Half	2nd Half
			1881-1913			
Number of quarters	61.0	24.0	37.0	38.0	25.0	13.0
Number of phases:						
Total	11	8	10	10	9	8
With rising:						
Exports	9	7	7	9	9	6
World imports	11	8	10	10	8	8
Annual percentage change in:						
Exports	+6.0	+13.0	+1.5	+9.6	+13.0	+3.1
World imports	+6.6	+7.2	+6.0	+4.8	+5.2	+4.4
			1921-38, 1948-58			
Number of quarters	36.0	20.0	16.0	16.0	8.5	7.5
Number of phases:						
Total	7	5	6	4	4	3
With rising:						
Exports	7	4	6	3	3	2
World imports				4	4	3
Annual percentage change in:	7	5	6			
Exports	+12.3	+15.2	+8.9	+4.4	+4.3	+4.6
World imports	+12.0	+16.4	+6.8	+8.0	+6.9	+9.8

The cycle 1929-37 is excluded.
Smoothed by three-quarter moving averages with double weight for center quarter.
The basis for the percentage change is the average level of the series during the cycle segment. The averages are weighted.
World imports exclude U.S. imports.
See Table 1, notes 1-3.

the sake of completeness and attention should be directed to phases including world expansions, i.e., co-expansions and counter-contractions which together comprise about two-thirds of the phases and also of the quarters covered. The rare occurrence of world contraction makes generalizations about co-contractions and counter-expansions difficult.[3] Do-

[3] In Tables 14 and 15 the cycle 1929-37 has been excluded. This reduces the percentage of co-contractions and counter-expansions to one-fourth of all quarters.

TABLE 15

World *Contractions* and Segments of Domestic Business Cycles: Average Change in U.S. Exports and World Imports, 1881-1958

	Domestic Expansion (counter-expansion)			*Domestic Contraction (co-contraction)*		
	Total	1st Half	2nd Half	Total	1st Half	2nd Half
			1881-1913			
Number of quarters	14.0	11.5	2.5	17.0	3.5	13.5
Number of phases:						
Total	5	5	1	5	2	5
With rising:						
Exports	0	0	0	0	0	0
World imports	0	0	0	0	0	0
Annual percentage change in:						
Exports	−10.4	−6.4	−29.0	−9.6	−8.8	−10.0
World imports	−5.6	−4.8	−10.4	−5.5	−5.6	−5.6
			1921-38, 1948-58			
Number of quarters	11.0	3.0	8.0	10.0	4.5	5.5
Number of phases:						
Total	4	2	3	3	3	3
With rising:						
Exports	0	0	0	0	0	0
World imports	0	0	0	0	0	0
Annual percentage change in:						
Exports	−13.1	−16.5	−11.8	−17.9	−12.2	−24.4
World imports	−8.2	−6.3	−9.3	−14.4	−11.6	−16.9

The cycle 1929-37 is excluded.
Smoothed by three-quarter moving averages with double weight for center quarter.
The basis for the percentage change is the average level of the series during the cycle segment. The averages are weighted.
World imports exclude U.S. imports.
See Table 1, notes 1-3.

mestic contractions, however, were more often counter- than co-contractions.

To measure the differing behavior of exports in early and late segments of cycle phases, we subdivide co- and counter-phases according to the stage of the domestic expansion or contraction. We thus distinguish eight types of cyclical periods, such as world expansion coinciding with the first half of domestic expansion, world expansion coinciding with the

second half of domestic expansion, etc. The number of observations for some of these cycle segments is very small; measures in such cases reflect largely random forces and are presented in Tables 14 and 15 merely for the sake of completeness. In those cases, however, where observations are sufficiently numerous, our results are surprisingly stable and support and supplement those previously obtained.

The finding which stands out most clearly in the tables is that U.S. exports nearly always move in the same direction as imports of the world outside the U.S., regardless of the domestic cycle stage. Despite the shortness of many segments, there has not been a single instance since 1881 when exports rose in early or late domestic expansions or contractions while world trade declined.[4] And among fifty-three cycle segments with world expansion, we count only nine with falling exports.

In direction U.S. exports follow world trade, but in rate of change they also reflect the course of domestic business. On this point our tables disclose a fundamental fact which could not be brought out by the analysis in the preceding chapters—that before World War I the influence of domestic business cycles on exports was inverse. Given rising world trade, U.S. exports grew far more rapidly in business recessions than in business expansions during 1881-1913.[5] The strength of the inverse effect can be seen when export changes are contrasted with corresponding changes in world trade which were positively related to U.S. business cycles. When rising world trade coincided with a business expansion, U.S. exports grew more slowly than world trade, but when world trade growth was accompanied by a business contraction, exports rose twice as fast as world trade. An increase in exports did not occur without an increase in world trade, but, given the latter, it was promoted by domestic business contraction and slowed down by expansion.

The inverse relation of exports and domestic business cycles does not stand out in measures of export movements during full cycles because of the slight positive relation between world trade and business cycles. Since falling world trade coincided somewhat more often with a contraction than with an expansion in domestic business, it lowered the average growth rate of exports more in the former than in the latter. Hence the 10 per cent rate in counter-contractions was reduced to 4 per cent in full domestic contractions (that is, in counter- and co-contractions taken together). The rate of change in full domestic expansions, on the other hand, was not affected as much by world trade contractions. Thus ex-

[4] This record should be noted in evaluating the 1958 decline.

[5] Measures for world contractions show just a trace of the inverse relationship. Exports fell a trifle more in domestic expansions than in contractions.

ports rose by 6 per cent in co-expansions and by 3 per cent in full expansions. In other words, the contrast between 6 per cent in domestic expansions and 10 per cent in domestic contractions—both within world trade expansions—is reduced to 3 per cent in all domestic expansions against 4 per cent in all contractions.[6]

For the period 1921-58, the measures in Tables 14 and 15 confirm the positive relation of exports and domestic business cycles. When world trade increases, exports now rise more in domestic expansions than in domestic contractions; when world trade declines, they fall more in contraction than in expansion. It is possible that this behavior of U.S. exports reflects the behavior of world imports which, in this as in the earlier period, rise and fall more in co- than in counter-phases. In other words, although increases in world trade did occur during American business contractions and declines during American expansions, such movements —and consequently those of U.S. exports in 1921-58—were milder than when the American economy and world trade moved in the same direction. In the earlier period, on the contrary, exports were more independent of world trade and their rate of growth increased when that of world trade fell, or vice versa. This implies that the shift in the relation of exports to domestic cycles represents, in part at least, a shift in the relation of exports to world trade.

We now gain a better understanding of the positive conformity of exports to the domestic cycles of 1921-58. Their rise by 7 per cent per year in business expansions can now be viewed as a composite of an average annual rise by 12 per cent in co-expansion and an average annual decline by 13 per cent in counter-expansions. The 4 per cent rate of decline in domestic contractions, on the other hand, averages a growth rate of 4 per cent and a rate of decline of 18 per cent in counter- and co-contractions.[7] The positive conformity of exports to domestic cycles within each world cycle phase combines with the positive conformity of world and domestic business cycles to produce the over-all conformity of exports to domestic business.

Our previous results for the intraphase pattern of exports for the period 1881-1913 are confirmed and clarified by the new measures. First of all, the same kind of sharp contrast between the two halves of expansions and contractions that was found in Chapter 7, without distinction

[6] In Chapter 3 the rate of change in domestic expansions was even found to exceed slightly that in contractions. The difference is due to variations in periods covered and in methods of measurement.

[7] The larger decline in domestic contraction given in Table 11 is due to the different method of measurement used in Chapter 5.

between world phases, is now seen to emerge within world expansions. Table 14 shows that, given world expansion, U.S. exports rose by about 13 per cent in the first half of domestic expansion and contraction, and by only 2 or 3 per cent in the second half of both phases. Thus a sharp decline in the rate of change of exports is found even when the effect of world contractions is eliminated.

Further, the decline in the rate of change of exports cannot be viewed as reflecting the similar behavior of world trade since the intraphase decline in the rate of change of the latter was much smaller than in exports. Thus, given world expansion, the U.S. export growth was two and a half times as fast as growth of world trade during the first half of domestic contraction, but it fell below that of world trade in the second half.

Finally, we find that during 1881-1913 the effect of the timing of world contractions was to reduce the contrast between U.S. expansion segments, but to sharpen the contrast between U.S. contraction segments. World contractions coincided mainly with the first part of domestic expansions and the second part of domestic contractions. Thus the rate of growth of exports as given in Table 12 for all late segments of domestic expansions is low despite the absence of world trade contractions in these segments. It is quite similar to the corresponding rate for co-expansions.[8] On the other hand, average growth in the first half of domestic expansions would have been as high as 13 per cent had it not been reduced to an average of 7 per cent by five brief world contractions which coincided with this segment. Retardation of exports in expansions thus seems to be due to domestic factors.

U.S. business contractions were, on the contrary, accompanied in 1881-1913 by contractions in world trade mainly during their second half. Consequently, the large fall in the rate of growth that occurred between the first and second halves of counter-contractions becomes even larger when co-contractions are included. The already small rise in U.S. exports during world expansions and later halves of domestic contractions becomes a decline when world contraction accompanies this part of domestic contraction. In other words, although the characteristic fall in the rate of change of exports from the first to the second half of domestic contractions does in part reflect similar unfavorable changes in world imports (see the fall during world expansions), it is also due, to some extent, to other forces.

The small number of observations in most classes and the irregularity of export movements reduce the usefulness of measures for segments of co- and counter-phases for the period 1921-58. We present these measures

[8] Only a single world contraction two and a half quarters long coincided with the second half of business expansions.

chiefly for the sake of completeness. Yet a few of their features may be noted.

Conformity of U.S. exports to world cycles remains high. Exports decline in every segment of world contractions and rise in nearly every segment of world expansion. As to the intraphase pattern, we found in Chapter 7 that the tendency for the rate of change to fall in the later parts of domestic expansions and contractions persisted in 1921-58, but that the decline was less sharp and less regular than before 1914. The present analysis adds the information that retardation was confined to, but was rather sharp in, co-phases. In co-expansions, U.S. exports rose on the average by 15 per cent in the early and by only 9 per cent in the later segments of domestic expansions; in co-contractions, their fall in the second half of domestic contractions by 24 per cent greatly exceeded the 12 per cent drop in the first half. That the over-all pattern of exports for this period as given in Chapter 7 still shows the fall in the rate of change is due to co-phases. In the counter-expansions of this period we find the pattern reversed, with exports falling more in the early than in the late part, while the movement was nearly the same in the two parts of counter-contractions.

Also in contrast to the period before 1914, in 1921-58 the rate of change of world imports fell in the later parts of co-phases similarly to the rate of U.S. exports. Thus the retardation of exports in late expansions and contractions may, in this period, well be due to a similar retardation of world trade.

We summarize the main findings of this chapter:

1. From 1881 to 1958, U.S. exports moved with very few exceptions in the direction of world trade in all four segments of domestic business cycles.

2. From 1881 to 1913, the development of exports within a given phase of the world cycle was more favorable in domestic contractions than in domestic expansions.

3. From 1921 to 1958, on the contrary, exports moved more favorably during domestic expansions than during domestic contractions in each phase of the world cycle.

4. In world expansions from 1881 to 1913, the rise of exports was sharply retarded in the second half of both domestic expansions and domestic contractions. This retardation is not accompanied by a similar one in world trade and seems to be due mainly to domestic factors.

5. In the cycles from 1921 to 1958, growth of exports was retarded or decline accelerated only in co-phases. In these, the rates of change of world imports corresponded quite well to those of U.S. exports; hence they may account, at least in part, for their behavior.