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## Summary

This study attempts to establish and explain the pattern of exports in the United States business cycles in 1879–1961. It aims at discovering, among other things, whether periods of domestic prosperity are associated with flourishing or with languishing export business, whether a business downturn provokes an export upturn, whether cycles in quantities shipped tend to run with or counter to, price cycles, and how great the differences are among cyclical patterns of the various classes of export goods.

The first chapter discusses the answers that might be expected to these and similar questions. Existing writings do not provide either a substantial body of empirical knowledge or incisive theoretical analysis of cyclical export patterns. In the case of U.S. exports, such patterns depend mainly on two factors: the relative timing of economic fluctuations at home and abroad, and the influence of domestic business cycles on exports.

There is no agreement among experts on the first factor—the factual question of what part of the time foreign and U.S. cycles run in opposite directions. Hence, there is no established opinion on the kind of influence foreign demand exerts on the relations between U.S. exports and U.S. business cycles.

As to the second factor—the impact of domestic cycles on exports—economic theory has long taught that the home market, during business expansions, draws resources away from exports. But while policy makers rely heavily on this view, it receives only scant attention in theoretical writings. Moreover, it is under attack today. There are those who argue that the surge in productivity which accompanies cyclical rises in home demand promotes rather than stifles exports and that the classical view is a fallacy. Neither this expansionist hypothesis nor the traditional one have so far been supported by more than fragmentary empirical evidence.

To provide such evidence for the United States and to clarify the impact of foreign cycles on our exports is the principal aim of this book.

The period covered reaches from 1879 to 1961. Four broad classes of exports are considered: finished manufactures, semimanufactures, food, and crude materials. Export price, quantity, and value data from 1879 to 1923 are those constructed by Robert E. Lipsey for the National Bureau; those for 1924-28 are by Dudley Cowden; and from 1929 on, Department of Commerce data are used. The world import series is based on German, League of Nations, and United Nations data. The data and their limitations are discussed in Chapter 2, which also describes some basic features of U.S. exports, world imports, and their interrelations.

As a preliminary step, the cycles in U.S. exports are examined regardless of their relation to foreign or domestic business cycles (Chapter 3). This reveals some new facts on export instability which agree in some respects, but disagree in others, with commonly held ideas. Thus, it is widely accepted in economic literature that fluctuations in export proceeds of primary goods producers largely reflect fluctuations in prices, while exports of manufactures are characterized by rigid prices and large swings in quantities. Furthermore, quantities and prices of all export classes are thought to move predominantly in the same direction and values hence to fluctuate more than quantities.

Some of these views are supported by our findings. For instance, the behavior of U.S. exports of manufactures is as expected, in the sense that quantity typically changes far more than price and that both usually move together so that value is more unstable than quantity. That prices of primary goods have wider swings than prices of manufactures is also confirmed. But the agreement ends when we turn to the measures of instability of the quantities of semimanufactures, crude materials, and foods exported from the United States. Quantities of all classes are found to be a great deal more variable than the corresponding prices. (The average annual rates of change of the former are two or three times as high as those of the latter.) Further, the quantities and values of nonmanufactures, with average annual rates of change of 19-35 per cent are not less but far more volatile than those of manufactures, with corresponding rates of 10 to 15 per cent.

The explanation of the contrast between these results and the findings of other studies, may be sought in two factors. First, there are differences in coverage. The common contention that the quan-

tity of primary goods exports varies less than their prices and less than the quantity of manufactures exports, seems to draw heavily on the experience of the extraordinary cycles that occurred during major wars and in the great depression of the 1930's, which are excluded from our averages. The supply of primary goods cannot, indeed, adjust to such tremendous changes in demand; hence, in these instances, prices bear the brunt of the adjustment. "Normal" fluctuations in foreign demand, however, can be met to a considerable extent by variations in quantities shipped, which thus are more unstable than prices. This holds particularly for the United States where most primary export goods can be shifted from and to the domestic market.

Secondly, differences among findings can be attributed to differing degrees of aggregation. Characteristics of the instability of total world trade need not apply to the instability of the exports of each individual country. Quantities of different export commodities are likely to reach their peaks and troughs at different times, and this reduces the amplitude of swings in the world aggregate. The timing of price movements shows less diversity and thus their amplitudes are less affected by aggregation. Hence studies of world trade find the quantity of primary exports more stable relative to price than studies of individual countries, and the prevailing view may hold for total world exports but not for exports of most individual countries.

The interrelations among the degree of instability of the various U.S. export series are remarkably consistent over time. An important shift, however, has occurred in the degree of instability of all commodity classes. Amplitudes of fluctuations in quantities and values are found to be much larger in the later cycles, even when the 1930's are excluded, than in the earlier ones. The contrast between this shift and the dampening of the domestic business cycle is striking and suggests that policies or structural changes conducive to international stabilization have been far less effective than those conducive to national stability.

The trend toward greater instability is partly offset in total exports by the increasing weight of manufactures, which are more stable than other types of exports. Put differently, the United States experiences as much or more instability of total exports today, though selling mainly highly diversified manufactures, as it did in earlier times when its exports consisted mainly of primary goods.

The next step is to investigate the relations of fluctuations in U.S. exports to changes in the outside world's demand for imported goods (Chapter 4). The total imports of foreign countries serve as the indicator of this demand.

The examination discloses that the real volume as well as the prices, and consequently the dollar values, of all commodity classes of U.S. exports rise and fall in most instances together with world imports over the period 1881-1959. Not only are export quantities, prices, and values typically higher at world import peaks than at world import troughs, but they also typically grow from stage to stage during world expansions and shrink from stage to stage of world contractions. In those instances in which a strong secular trend in U.S. exports runs opposite to the phase of the world import cycle, the influence of the latter appears in a retardation of an export increase or of a decline.

Export quantities respond, as a rule, far more strongly to changes in foreign demand than export prices do in all classes of U.S. exports. This extends the aforementioned finding that—contrary to common belief—quantities of primary goods exports fluctuate more than their prices. We now know that the part of these fluctuations which can be regarded as demand determined is also far larger in quantities than in prices. Evidently export supply of nonmanufactures is more elastic than commonly thought, at least in the United States.<sup>1</sup>

The measures also reveal, however, that there is an element of truth in the common notions on export instabilities. Though quantity responds far more strongly than price to shifts in demand in all export classes, the ratios of quantity to price changes during world cycles are, indeed, substantially higher for manufactures than for primary goods. In quantities of manufactures exports a larger part of variations is due to world demand than in crude materials or foods. Prices of manufactures exports, on the contrary, are more independent of foreign cycles than other export prices. Thus adjustments in manufactures exports occur almost entirely in quantities with negligible price changes, while in crude materials and foods, price changes, although smaller than quantity changes, amount to from one-third to three-fourths of them. In dollar values, the behavior of the different types of export commodities during world

<sup>1</sup> Findings by others on primary producing countries are noted in the text around Table 6.

import cycles is, therefore, more uniform than in terms of quantities and prices.

The agreement of total U.S. exports and world imports is better than the agreement on the average of the separate export classes and world imports. This holds for prices, quantities, and values. It is due to the fact that export fluctuations which are not caused by foreign demand tend to occur independently in the several classes and hence to offset one another. Responses to the pull of world demand, on the other hand, typically occur simultaneously in more than one class, thus reinforcing each other. In this way the cyclical change in total export value accounted for by world cycles climbs to a figure as high as 80 per cent during 1921-59.

Fluctuations in the total value of U.S. exports agree better with movements in world imports in more recent than in earlier cycles. This is due largely to the shift toward exports of manufactures which agree better than other classes with world imports. Their greater weight pulls total exports toward conformity to world cycles.

U.S. business cycles are brought into the picture in Chapter 5 where we try to explain turning points in export quantities by the impact of foreign and domestic business cycles. Since some peaks and troughs in the latter stand far apart from world import cycle turns, the separate impact of the two factors can be observed to some extent and considerable insight into the causes of export reversals can be gained.

Clearly the most important of these causes is foreign demand as represented by world imports. Its peaks and troughs are matched with few exceptions by corresponding turns in our exports. Among commodity classes some systematic short leads and lags prevail. Exports of crude materials and foods tend to turn down before peaks in world imports are reached, and exports of finished manufactures tend to turn up before troughs. There is no evidence by this standard, it may be noted, of any decline during the 1950's in the "competitiveness" of U.S. exports, such as might be suggested if they lagged longer behind upturns in world imports at the trough or fell sooner at the peak than in earlier times.

Though a reversal in world imports is typically associated with a like one in U.S. exports, about one-third of the turns in the latter do not match turns in world imports. Are these extra turns caused by the swings in domestic business activity? The answer in most instances is that domestic demand is an important factor and it oper-

ates in a manner opposite to that of foreign demand. When, say, an upturn in the quantity of crude materials exports coincides with a downturn in their prices and also with a downturn in the domestic business cycle, it appears likely that the weakening of domestic demand contributes to the softening of prices and the revival of exports. This view is supported by contemporary comments on the course of events.

The frequency of export turns due to domestic rather than to world import cycles differs widely among commodity classes and from one period to another. Such turns virtually never occur in exports of finished manufactures, which reverse their direction almost exclusively when world imports do. This has the important implication that an expansion of domestic demand does not stop a rise in these exports, nor does a downturn in domestic business bring about a revival.

Exports of crude materials, on the other hand, turned up almost every time domestic business fell back from a peak prior to World War I. That declining home demand contributed to the revival of exports in these instances is affirmed by a simultaneous softening of prices. Similarly, domestic expansion almost unfailingly brought the growth of crude material exports to a halt, and again one finds that price troughs were associated with quantity peaks. Rather unexpectedly, the inverse relation of crude materials exports to domestic business cycles was frequently reinforced from the supply side. Of these exports 50 to 60 per cent consisted of cotton in those years, and cotton crops frequently moved opposite to business cycles. Thus, exports often fell in business expansions due both to rising home demand and to falling supply, and the opposite occurred in times of business contraction.

The declining role of cotton and the closer synchronization of U.S. cycles and world import cycles, along with other factors, caused turns in crude materials exports to occur less often at opposite turns in U.S. business cycles after World War I, and never in the 1950's. This shift in behavior accounts for part of the shift in the movement of total export value toward positive conformity with domestic business cycles.

Food exports are less likely than crude materials to be affected by variations in domestic demand. Nevertheless, before World War I, the number of turns in the quantity of food exports which were associated with opposite turns in the business cycle exceeded the number associated with like turns in world import cycles. This

inverse relation was also present to some extent in the interwar period. Since World War II, however, large stockpiles have countered the effects of changes in domestic demand on food exports, and governmental programs have sometimes caused food exports to turn upward at about the time of a business trough. Hence, turns in food exports have lately tended to occur near like turns in domestic business cycles.

This diverse behavior of the various commodity classes has the following effect upon the timing of turns in total export quantity. From 1879 to 1913, when exports consisted largely of crude materials and foods, about half of the peaks and troughs in the total match opposite turns in U.S. business cycles, while most of the remainder match like turns in world imports.

In more recent periods, the inverse effect of the domestic cycle on exports of crude materials and foods has weakened, and finished manufactures, which even in earlier years did not move in a direction opposed to the domestic business cycle, have become the largest export class. With the lessened interference of cyclical swings in the United States, most turns in total exports are now associated with turns in world imports, which also often places them near like turns in the domestic business cycle. Government policies on agricultural exports at times reinforce the positive relation of total exports and domestic business cycles, particularly at troughs. Hence, the most likely location of total export turns after World War II is in the vicinity of like turns in U.S. business cycles.

The findings of Chapter 5 are reinforced and supplemented by those of Chapter 6, which is the core of the study and presents the analysis of the direction and amplitude of movements of export quantities.

It establishes, first of all, the fact that U.S. export quantities of all classes tended to move with, rather than against, U.S. business cycles since 1921. They typically fell more rapidly, or rose more slowly, during business contractions than during the preceding and following expansions. The rate of growth of total export quantity declined in six out of the eight contractions in 1921-61. (The exceptions are the contractions of 1923-24 and 1953-54.)

Second, the rates of rise and fall of export quantities during domestic business cycle phases in 1921-61 were found to be quite moderate and amounted to only a minor fraction of the total cyclical movement in export quantity cycles. Also, vigorous business ex-

pansions and severe depressions were not, as a rule, associated with larger changes in export quantities than weak expansions and mild recessions were. The conclusion is that the relation of export quantity changes and U.S. business cycles, although positive, was weak.

Third, and most important, it is demonstrated that the impact of domestic business cycles on total export quantity and on all classes except finished manufactures was an inverse one. Exports were helped by domestic contraction and hampered by expansion, as expected by traditional theory. The rough parallelism of their movements and U.S. business activity in 1921-61 is due to the agreement of foreign and domestic business cycles.

Fourth is the finding that export quantities of finished manufactures behaved differently from other classes. Their positive relation to the domestic business cycle is not entirely accounted for by the parallelism between world demand and U.S. business cycles. The question whether this indicates a positive effect of swings in home business on these exports has been approached in various ways. According to my interpretation, the evidence does not suggest such an effect. But neither does it suggest an inverse one. Rising domestic demand does not seem to have caused either curtailment or stimulation of U.S. exports of finished manufactures, as a rule.

This last finding holds not only for the cycles since 1921 but also for the earlier ones so that the pattern of finished manufactures exports is basically the same from 1879 to 1961.

The unresponsiveness of finished manufactures exports to domestic business swings may be due to a combination of factors which affect the goods concerned in varying degrees. The over-all supply of some manufactured goods is probably elastic enough to absorb variations in domestic demand with only slight price changes. For other goods in this class, substitutability between export and home varieties is poor so that fluctuations of sales of the latter have little impact, in the short run, on the former. Finally, foreign demand for highly differentiated manufactures is not likely to be sensitive to small price changes in the short run.

On the other hand, a sharp contrast between earlier and later cycles is found in the patterns of other export classes and of total export quantity. Crude materials exports tended to fall or to slow down when business expanded in 1879-1913 and to rise or accelerate when business slumped, and their pattern is reflected in that of total export quantity. Furthermore, rates of change of domestic business activity tended to be inversely associated with those in total

and crude materials export quantities. The depressing effect of home prosperity was reduced but not compensated for by the stimulation of exports due to rising foreign demand, which often occurred during U.S. upswings.

The behavior of the second large class of exports of that period—foods—was basically of the same type as that of crude materials. However, the adverse effect of domestic expansion on food exports is obscured in average measures by the few instances in which an upsurge of food exports was the cause of a business revival. These episodes of positive relation between food exports and business cycles turn what otherwise would be an inverse relation into a mixed one.

Comparison of the two periods, then, reveals sharp contrasts as well as impressive continuities, which explains the existence of diametrically opposed views on the stability of international economic relations in the literature. On the one hand there is the remarkable persistence of the pattern of response of nonfood exports to world demand and also the unmistakable family resemblance of relations of these same exports to U.S. business cycles. The fact that, after allowing for the influence of world import cycles, the total quantity of exports and the quantity of crude materials exports move inversely to, and the quantity of finished manufactures positively with, U.S. business cycles in both periods, certainly reflects stability of relationships.

But, on the other hand, there is no doubt that a shift in the behavior of export quantities during U.S. business cycles has taken place, a shift toward less inverse, more positive movement. This shift is explained, first, by the increasing integration of the world economy. That U.S. business cycles and world import cycles disagree less frequently than in earlier years, means that demand effects run parallel with the domestic business cycle more often and thus pull exports into line with domestic business.

Second, the commodity composition of exports changed in such a way as to reduce progressively the inhibiting influence of domestic expansion and the stimulating effect of recession on export quantities. As goods with elastic supply came to play a larger role, fluctuations in domestic demand were absorbed to a greater extent and their effect on foreign sales was neutralized. This applies not only to the increasing importance of finished manufactures, which of course is responsible for part of the more positive relation of total export quantity to domestic business cycles in the later period. It also applies to shifts which must have occurred within commodity

classes and which account for the less inverse and more positive patterns of the quantities of crude materials and finished manufactures, respectively. One force at work here is the increased diversification of exports in each class, which reduces in many instances the share of the output of individual commodities that is exported. Further, the reduced role of agricultural goods and the higher degree of fabrication generally should lessen the influence of domestic sales on export supply. The reduced role of cotton exports is the most important case in point.

In sum, export quantities move more with and less against domestic business in recent than in earlier times mainly because of the better agreement in timing of U.S. and foreign business cycles and because of the increasing role in exports of goods whose export supply is not inversely affected by the domestic business situation.

The final step is to use the analysis of export quantity movements to understand that aspect of exports which is relevant from the balance-of-payments point of view—the rise and fall in their total current value.

Since exports in current and in constant dollars move generally in a similar fashion, changes in the latter provide most of the explanation of changes in the former. There are discrepancies, however, and they require examination of the behavior of export prices which is provided in the first part of Chapter 7.

Again, there is no established opinion about the expected pattern of export prices in business cycles. The question whether these prices respond primarily to domestic or, rather, to foreign business conditions is, in fact, a highly controversial one. Some implications of our findings for this issue are mentioned in Chapter 7. Here we confine ourselves to the role of prices in export value cycles.

Two findings which are basic from this point of view are, first, that export prices fluctuate far less than quantities, and, second, that they move typically *with* domestic business cycles. Consequently, movements of export values must agree better—though not very much better—with domestic business cycles than quantity movements.

Again there is a surprising similarity in one sense and a drastic contrast in another between price patterns before and after World War I. Total export prices in 1921–61 moved almost without fail in the same direction as U.S. business activity, a record of conformity which exceeds that of domestic wholesale prices. It reflects mainly the very close agreement of the rise and fall in prices of semimanu-

factures exports with U.S. business cycles. Prices of finished manufactures also responded, as a rule, to the influence of the domestic cycle, while prices of crude materials and foods prices were more irregular.

The contrast between the earlier and the later period is in the timing of the price movements. Before 1913 the rise (or the retardation of the fall) did not get under way before mid-expansion, as a rule, but lasted for a while when business had already turned downward. This slowness in response means that prices were not always higher at business cycle peaks than at troughs, and hence had only a moderate effect in bringing export values in line with domestic business cycles. When, on the other hand, timing differences are taken into account, export prices show a systematic positive response in both earlier and later cycles.

World import cycles contribute moderately to the conformity of export prices to U.S. business cycles. Even without their influence, the amplitudes of total export price changes would have agreed well with the amplitudes of business cycle phases after 1921. Before World War I the relation (on a synchronous basis) of total export prices to domestic business cycles was—without the help of world import cycles—a very loose one, although still positive.

Combined with the analysis of quantities, this information about export prices provides an understanding of the rise and fall in the strategic export figure—total value.

Despite timing discrepancies, changes in total export prices agreed sufficiently with domestic business cycles, before World War I, to counteract the inverse movements of total quantity. Hence, average fluctuations in total export value during business cycles were small and irregular in 1879–1913. Business contractions were accompanied by acceleration about as often as by retardation of total export proceeds, and movements associated with business cycles accounted for a negligible fraction of the cyclical variation in total export value. Typically, receipts from foreign sales were higher at business peaks than at the preceding troughs because an unchanged volume of goods was sold at higher prices. And these receipts were up again at the succeeding troughs because lower prices were outweighed by much larger quantities sold.

The irregular behavior of total export value is not repeated in the component commodity classes. It results, rather, from opposite behavior of crude materials value, on the one hand, foods and manufactures value on the other. Typically, during U.S. business recessions, the rate of growth of the former increased, while that of the latter

declined. This diversity of the effects of the domestic business cycle on the different commodity classes in 1879-1913, and the consequent irregularity of total export value, was not ironed out by fluctuations in foreign demand whose influence was weakened by the timing differences between cycles abroad and in the United States. The lack of synchronization prevented foreign demand from pulling exports into line with U.S. business cycles before 1913. Its influence was merely to impart a mild positive tendency to what otherwise would have been a barely discernible inverse relation. The failure of total export value to respond systematically to earlier U.S. business cycles thus reflects the latter's offsetting effects on quantities and prices of different commodity classes in a period in which the unifying effects of world import cycles were weak.

After World War I, both export quantities and export prices came to agree well with fluctuations in U.S. business. Hence total export value in 1921-61 follows closely the path of business activity, rising when it expands, falling when it contracts, and even aping to some extent the amplitude of the domestic fluctuations.

The behavior of the aggregate is now representative of all class quantities and prices. Declines or retardations predominate during business contractions in all components, and amplitudes of change in all of them are positively related to those in business activity. Proceeds from exports, thus, act much like those from domestic sales, in that quantities sold surge upward together with prices.

Much of this agreement between total export value and business movements is explained by the agreement between foreign and U.S. business cycles which causes the demand for our exports to rise when domestic business expands and to fall when it contracts. When the influence of world demand is eliminated, the similarity between home and foreign sales vanishes. Domestic business swings are then seen to have opposing effects on export quantities and export prices in this as in the earlier period. With constant world demand, a surge in home business again tends to stunt the total physical volume of exports and to raise their prices.

In contrast to the earlier period, however, the positive effects of the domestic cycle on export prices are stronger, on the average, than the negative effects on quantities in 1921-61. This indicates that synchronization of world and domestic cycles is an important, but not the sole, reason for the shift in export patterns. Even without the influence of foreign demand, the total value of U.S. exports

would have tended to rise more in U.S. expansions than in recessions since 1921.

The independent positive relation of total export value to domestic cycles is due largely to the lack of response of the export quantity of finished manufactures to the ups and downs in home business. Due to the big role of this class, the negative effect of the domestic cycle on total quantity is weak. On the other hand, positive effects on prices also are milder for most commodity classes than might have been expected. It is mainly the very high correlation of semi-manufactures prices which accounts for the fact that the behavior of total prices accords with expectations. In sum, with constant world demand, the total value of U.S. exports would have risen during business upswings because the advance in the prices of semi-manufactures and the growth in quantities of finished manufactures would have outweighed the fall in export quantities of crude materials and foods.

The long historical record of cyclical fluctuations in U.S. exports examined in this book reveals one fact that is of special interest from a policy viewpoint: Cyclical business expansions of the type experienced in these eighty-odd years do not appear to have adversely affected the total dollar value of U.S. exports. This is true although—apart from variations in foreign demand—cyclical expansions of the home economy have tended to raise the prices and to reduce the volume of total foreign sales, as predicted by traditional economic theory. The positive effects on export prices have, on the average, roughly offset the negative effects on quantities before 1913 and exceeded them since 1921. Repression of home demand thus would not, on the basis of historical experience, appear to be a promising route for achieving a rise in the total value of U.S. exports.