

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Growth of Industrial Production in the Soviet Union

Volume Author/Editor: G. Warren Nutter assisted by Israel Borenstein and Adam Kaufman

Volume Publisher: UMI

Volume ISBN: 0-87014-074-4

Volume URL: <http://www.nber.org/books/nutt62-1>

Publication Date: 1962

Chapter Title: Summary

Chapter Author: G. Warren Nutter

Chapter URL: <http://www.nber.org/chapters/c1980>

Chapter pages in book: (p. 283 - 292)

CHAPTER 9

Summary

ANY summary of Soviet industrial performance must start with a few words on the difficulties of appraising it. The student of the Soviet economy takes his data from the official Soviet press, and therein lie unusual troubles. Some scholars may find it hard to believe that Soviet statistics are "really" worse than others, because every specialist in no matter what field quickly becomes convinced that no data could be as bad as those he is forced to work with. Why call the kettle black when it is probably no grayer than the pot?

Let us acknowledge at once that all statistics contain faults and errors. Let us also acknowledge that no government or other agency resists the temptation to stretch figures to its own account if it feels it can get away with it. Representative government, competitive scholarship, and free public discourse are the Western institutions that have counteracted error and misrepresentation in statistics, imperfectly to be sure but at least to an important degree.

The peculiar difficulties with Soviet statistics stem, in the first instance, from the system of authoritarian, centralized planning—from what has been called a "command economy." Published statistics come from only one source: the state. There are no independent sources to restrain each other or to be used as checks against each other, except to the extent that related figures published by different state agencies might not be fully coordinated before publication. Moreover, the suppliers of data to the central authorities—the economic and administrative units—have a stake in the figures they report, since their performance is judged on the basis of them. The Soviet statistical authorities do not hide their concern over the misreporting that results from this feature of the economic system.

A second set of difficulties stems from the crusading nature of Soviet communism. Statistics are grist for the propaganda mill. The drive to proselyte prevents Soviet leaders from viewing and dispensing facts in a passive and detached manner.

For both broad reasons, Soviet statistics are selective and of varying reliability and ambiguity. The policy of selectivity has two rather opposing results as far as statistics on physical output are concerned. On the one hand, some areas of poor performance are shielded from view, being underrepresented in published data. On the other hand, some of the

SUMMARY

more rapidly expanding economic activities associated with the military sector are also not reported on. It is impossible to determine the net bias of the sample of published data—whether there is, on this count, a net over- or understatement of growth.¹

A few broad generalizations can be made about the reliability of the published statistics. In the first place, absolute output is probably overstated in the case of most industries, particularly for the years within the Plan period, though the degree of overstatement cannot be determined. In the second place, growth in output is also probably overstated relative to a prerevolutionary or an early Soviet base, but not necessarily over other parts of the Soviet period. Over some of the latter years growth may be overstated, over others understated, and over still others more or less accurately reported. This will vary from industry to industry and from one situation to another.

Whatever the faults of data on output of individual industries, they are more reliable than official aggregative measures, such as the official Soviet index of industrial production. Although the details underlying this index have not been made public, Western specialists are generally agreed that, from what they know about the construction and behavior of the index, it heavily exaggerates industrial growth, though apparently decreasingly so in recent years.

There are other factors in addition to the defects in basic statistics that make it difficult to construct meaningful measures of aggregate industrial production. Soviet prices generally do not accurately reflect relative costs of production; the industrial structure has shifted radically over short periods of time and has increasingly favored sectors where growth is most easily achieved; growth rates have differed widely from sector to sector; growth has been interrupted at critical points by major disturbances; and so on. Finally, quantitative growth has not been accompanied by the general improvement in quality that has characterized industrial development in most Western countries.

These considerations make it difficult to summarize Soviet industrial performance in terms of mere numbers. But a summary is useful and necessary, and it cannot be fully qualified at every point without turning it into the voluminous report it is supposed to summarize. In what follows, the necessary qualifications are intended to be implicit throughout, and they should be kept in mind to dull the edge of deceptively sharp figures.

¹ These brief comments apply to the condition of economic statistics since 1956. Between 1938 and 1956, statistics on physical output of individual industries were not published at all in the Soviet Union, with a few minor exceptions.

SUMMARY

Soviet Industrial Growth

GROWTH IN OUTPUT

Soviet industrial output multiplied more than six times over the period 1913-1955. Performance varied widely among sectors, with output multiplying fifty-eight times in the case of machinery and equipment (including military products), nine times in the case of intermediate industrial products, but only three times in the case of consumer goods. The average annual growth rate was 4.4 per cent for industry as a whole, 10.1 per cent for machinery and equipment, 5.5 per cent for intermediate industrial products, and 2.6 per cent for consumer goods.

Some of this growth is attributable to the territorial expansion that took place during and after World War II. We have estimated that the acquired territories added about 11 per cent to industrial output, and, if we suppose that this relation would also have held true in 1955, the average annual growth rate for all industry over the Soviet period would have to be reduced from 4.4 to 4.1 per cent to eliminate the gains from territorial expansion. The assumptions underlying such an adjustment are, of course, somewhat arbitrary.

The dispersal of growth trends (unadjusted for territorial expansion) may be seen more clearly by examining a finer breakdown of industries. For a sample of seventy industries, growth rates ranged from an average annual decline of 0.9 per cent to an average annual increase of 16.8 per cent; the middle half of these growth rates ranged between increases of 2.5 and 8.5 per cent. The median was 5.3 per cent, which is higher than the weighted average of 4.4 per cent shown by the production index. Industries producing consumer goods dominate a distinct, lower region of growth and are essentially confined to it, while other industries are concentrated about a higher region.

The over-all growth rate is lower for the Soviet period than for the last forty-odd years of the Tsarist period, when the growth rate was 5.3 per cent a year according to our index. Although the latter is based on a weak foundation of data and might have come out differently if better data had been available, one may allow for substantial relative overstatement of Tsarist growth, presuming all the error in that direction, and still conclude that it was faster than growth over the entire Soviet period. As to individual industries, higher growth rates in the one period are not systematically related with either higher or lower growth rates in the other. Here again, the sample is small, covering only twenty-three industries, and conclusions must therefore be tempered.

SUMMARY

There has been a rather striking inverse relation between the rapidity of growth in an industry over the Soviet period and its "stage of development" at the beginning of the period. For a sample of forty-eight industries, those whose outputs were the smallest relative to the United States in 1913 have shown a strong tendency to grow the fastest. The tendency is even more pronounced when the Plan period is considered by itself, the stage of development in this case being measured as of 1928 and the growth over 1928-1955. A growth pattern of this sort is to be expected of any country undergoing rapid industrialization, but in the Soviet case the evidence suggests it has been accentuated by planned design, an effort to "overcome and surpass the leading capitalist economies."

Growth has varied widely not only among industries, but also over different spans of time. The early years were marked by disorder, war, and chaos, so that measurable industrial output dropped by 80 per cent between 1913 and 1920. By 1927 or 1928, industrial output had roughly recovered to its 1913 level in quantitative terms, though a general deterioration in the quality of industrial goods over this period meant that the recovery was less complete. Moreover, it was uneven even if no allowance is made for deterioration in quality: the 1913 level of output was not achieved in the case of consumer goods, while it was somewhat exceeded in the case of all other products.

With the institution of the First Five Year Plan at the end of 1928, growth accelerated rapidly and generally except in consumer goods. The acceleration continued through the Second Five Year Plan and extended into consumer goods. Against a background of political purges and partial wartime mobilization, the pace of industrial growth slackened in the succeeding three years of the short-lived Third Five Year Plan, and such growth as took place may be attributed to territorial expansion.

World War II brought with it a sharp decline in output—offset in large part by Lend-Lease shipments—and heavy losses in manpower and capital. Recovery was swift in the Fourth Five Year Plan, being aided by collection of reparations and other economic policies in Eastern Europe, so that the prewar level of industrial output was apparently regained by 1948 or 1949. Rapid growth was maintained through the Fifth Five Year Plan, where our study largely ends. Industrial output about doubled between 1940 and 1955. The annual growth rate has declined somewhat since 1955 to a level slightly above the average for 1928-1955.

SUMMARY

Over the Plan period (1928–1955) the average annual rate of growth was 6.9 per cent for all industry (6.5 per cent if territorial gains are excluded), 8.4 per cent for intermediate industrial products, 14.7 per cent for machinery and equipment, and 4.2 per cent for consumer goods. The growth rate has tended to slow down or retard: for all industry, it was 9.9 per cent a year over 1928–1940 (8.9 per cent if territorial gains are excluded) and 4.6 per cent over 1940–1955; or, if the war years are removed from consideration, it was 12.1 per cent a year for 1928–1937, 9.6 per cent for 1950–1955, and 7.1 per cent for 1955–1958. There is a similar retardation in growth for each of the categories of intermediate industrial products, machinery, and consumer goods.

As in other countries, retardation in growth has been general for individual industries, narrowly defined. The available evidence indicates that most industries experienced a slower growth over the Soviet period than over the late Tsarist period, and over the later Soviet years than over the earlier ones. Moreover, most of the industries with retardation in growth from the Tsarist to the Soviet period also had retardation within the latter.

GROWTH IN OUTPUT AND EMPLOYMENT

The growth in industrial output has been accompanied by a rapid expansion of the industrial labor force. The number of persons engaged in Soviet industry, expressed in full-time equivalents, multiplied 3.3 times between 1913 and 1955; the number of man-hours, 2.8 times. Thus 46 to 54 per cent of the growth in output may be attributed to expanded employment and the remaining fraction to increased labor productivity. Put another way, man-hours (or persons engaged) increased at an average annual rate of 2.5 (or 2.9) per cent, while labor productivity increased at an average annual rate of only 1.9 (or 1.5) per cent. The growth in output per person engaged ranged from 0.7 per cent a year for wood construction materials to 4.3 per cent a year for electricity.

Growth in labor productivity, as we have measured it, has fluctuated from period to period, and it is not clear whether there has been any trend toward either retardation or acceleration. Employment in man-hours apparently grew slower than output between 1913 and 1928, 1928 and 1937, and 1950 and 1955; it apparently grew faster between 1937 and 1950, a period of radical structural change in industry. Persons engaged also outpaced output over 1928–1933, another period of radical change, but otherwise grew slower than output. While the growth rate in output per man-hour shows some decline between 1913–1928 and

SUMMARY

1928-1955 and between 1928-1940 and 1940-1955, it shows a sharp increase between 1928-1937 and 1950-1955.

GROWTH IN OUTPUT AND POPULATION

While industrial employment was multiplying 3.3 times between 1913 and 1955, population multiplied only 1.4 times. Expansion of the industrial labor force was achieved, particularly in the earlier phase of industrialization, by drawing upon a large supply of underutilized labor, attached primarily to agriculture. It follows that growth in industrial output has been more rapid per head of population than per worker: 3.5 per cent a year compared with 1.5 per cent.

Soviet demographic statistics are sketchy and subject to many doubts, so that it is particularly difficult to say anything with confidence about fluctuations in per capita output. According to Soviet data as modified and interpreted by Western scholars, population within Soviet boundaries grew at an average annual rate of 0.6 per cent over 1913-1928, 1.0 per cent over 1928-1937, 6.4 per cent over 1937-1940 (because of territorial expansion), -0.9 per cent over 1940-1950 (because of war and its aftermath), and 1.7 per cent over 1950-1955. Despite a rather erratic relationship between growth in population and industrial output over different spans of years, growth rates have tended to move in the same direction for both total and per capita output. Thus the average annual growth in per capita output rose from -0.5 per cent over 1913-1928 to 5.8 per cent over 1928-1955; within the Plan periods, it fell from 7.4 per cent over 1928-1940 to 4.6 per cent over 1940-1955, or from 11.0 per cent over 1928-1937 to 7.8 per cent over 1950-1955.

Industrial Growth Compared: Soviet Union and United States

CONTEMPORANEOUS GROWTH

Over concurrent periods, industrial output has typically grown faster percentage-wise in the Soviet Union than in the United States. This was also true of Russian industry in the late Tsarist period: Russian growth over 1870-1913 was at the average annual rate of 5.3 per cent compared with U.S. growth at 5.1 per cent. The differential was similar over 1913-1955, with growth at 4.1 per cent a year in the Soviet Union, excluding territorial gains, and 3.8 per cent in the United States. At the same time, the absolute growth in industrial production has been much smaller in the Soviet Union than in the United States. Measured in 1954 dollars, the value added of industry rose by about \$30 billion in the Soviet Union over this period but by \$115 to \$120 billion in the United

SUMMARY

States. Percentagewise, however, Soviet growth including territorial gains has exceeded U.S. growth in all major sections of industry except for food and allied products. With territorial gains eliminated, Soviet growth was probably also slower—or no faster—than U.S. growth in the cases of chemicals and textiles and allied products.

Over 1913–1928, Soviet output grew at 0.1 per cent a year, with no allowance for deterioration in quality, while U.S. output grew at 3.7 per cent. The differential swung sharply in the other direction over 1928–1955, when growth was at the rate of 6.5 per cent a year in the Soviet Union and 3.8 per cent in the United States. Within the latter period comparative performance showed the same kind of shift: over 1928–1940, the Soviet growth rate was 8.9 per cent a year (territorial gains excluded) compared with the U.S. growth rate of 1.8 per cent; over 1940–1955, on the other hand, the Soviet rate was 4.6 per cent compared with 5.4 per cent. Over 1950–1955, however, the Soviet rate of 9.6 per cent substantially exceeded the U.S. rate of 5.3 per cent. In the few years since 1955, growth has continued to be much faster in the Soviet Union—7.1 per cent a year over 1955–1958—than in the United States—2.2 per cent a year over 1955–1959. It is doubtful, however, that either of these rates has much long-term significance.

Measured percentage growth in output has retarded in both countries between the two periods of forty-odd years before and after the second decade of the twentieth century. Within the more recent long period, measured growth apparently also retarded in the Soviet Union but not in the United States.

Population has generally grown more slowly in Russia and the Soviet Union than in the United States, so that comparative growth in per capita output favors the Soviet Union (or Russia) more than comparative growth in total output. On the other hand, industrial employment has grown more rapidly in the Soviet Union than in the United States: over 1913–1955, man-hours multiplied 2.8 as compared with 1.5 times; persons engaged, 3.3 as compared with 2.0 times. As a consequence, output per unit of labor—and, on the basis of such evidence as is available, output per unit of combined labor and capital—grew faster in the United States than in the Soviet Union over all periods compared except 1928–1937 and 1950–1955. The respective growth rates over 1913–1955 were 2.8 and 1.9 per cent a year. The same generalization applies, at least on a man-hour basis, to all major sectors of industry except metals and machinery and allied products. In the United States, improvement in output per man-hour accounted for 69 per cent of the multiplication in

SUMMARY

output over 1913–1955; in the Soviet Union, for 54 per cent. The evidence on possible long-term drifts in the growth rate of labor productivity is ambiguous in the case of both countries.

Compared with the United States, a larger fraction of Soviet industrial employment—and, almost certainly, production—has been concentrated in sectors of industry where labor productivity—and probably total resource productivity—has been growing faster than the average. Consequently, measured growth in output is biased upward on this score in the Soviet Union relative to the United States. Had the Soviet path of expansion more nearly represented the U.S. path in this respect, the Soviet production index would have shown a slower rise than it does.

Estimated in current dollars, the value added of Soviet industry rose from about 14 per cent of the U.S. level in 1913 and 9 per cent in 1928 to about 23 per cent in 1955; estimated in current rubles, from about 11 and 6 per cent to about 20 per cent. These estimates for 1955, even when allowance is made for possible error (no less likely upward than downward), are considerably lower than the conventional Western estimate of 33 per cent, which has apparently been based on industry-by-industry comparisons of physical output ratios. Such an estimate will almost certainly exaggerate the comparative level of Soviet output since industry embraces a much smaller range of products in the Soviet Union than in the United States.

While the relative gap in production has been narrowing between the two countries, the absolute gap has been widening. Measured in 1954 dollars, the value added of industry was \$25 to \$30 billion larger in the United States than in the Soviet Union in 1913, \$50 to \$55 billion larger in 1928, and \$115 billion larger in 1955.

The Soviet value of conventional military products amounted to more than 70 per cent of the U.S. level in 1955 when estimated in current dollars. The value of conventional military products accounted for more than a quarter of the value added of industry in the Soviet Union and for less than a tenth in the United States, all magnitudes again being expressed in dollar terms. It goes without saying that these estimates for the Soviet Union are subject to an even wider range of error than normally (probably upward), since they have been made by roundabout procedures.

Soviet value added per head of population, evaluated in dollars, rose from about 10 per cent of the U.S. level in 1913 and 7 per cent in 1928 to about 18 per cent in 1955. On the other hand, value added per man-hour employed fell from about 24 per cent in 1913 and 22 per cent in 1928 to about 20 per cent in 1955. In all cases the fractions based on evaluations in rubles are smaller but move in the same directions.

SUMMARY

COMPARABLE GROWTH

While study of Soviet and U.S. growth over concurrent periods is of interest in its own right and particularly in suggesting the course of events in the immediate future, it does not provide an adequate basis for appraising the growth-generating efficiency of the two economic systems. For this purpose, an attempt must be made to analyze performance over periods in which technological conditions and attained levels of production relative to the resource potential are the same in the two countries. Unfortunately, we cannot standardize both factors simultaneously in historical study: to set the level of production equal—we take the resource potentials as roughly equivalent in the two countries—is to project study back into a period for the United States in which available technology was substantially inferior to that of a “comparable” period for the Soviet Union. Nevertheless, this is the best we can do, and at least we know that the comparison favors the Soviet Union.

On the average and roughly speaking, the aggregate level of industrial production was about the same in the United States of 1875 and the Soviet Union of 1913 or 1928. In the United States, production grew at an average rate of 5.1 per cent a year over 1875–1917 and 5.5 per cent over 1875–1902; in the Soviet Union, at 4.1 per cent over 1913–1955 and 6.5 per cent over 1928–1955, territorial gains excluded. Hence, despite the technological differential in favor of the Soviet Union, U.S. output grew faster over the longer periods compared; on the other hand, it grew slower over the shorter periods, though not perhaps beyond what would be expected in view of the technological differential. Over even shorter periods that leave out the worst years of Soviet performance, growth has also been faster in the Soviet Union than over comparable U.S. periods. For example, the average annual growth rate was 8.9 per cent in the Soviet Union over 1928–1940, compared with 6.7 per cent in the United States over 1875–1887.

In the case of growth in output per head of population, the differential has been more favorable to the Soviet Union, so that Soviet growth exceeds U.S. growth in all comparable periods studied. It is, however, doubtful that this means much from the point of view of comparative economic performance, since population growth has not conditioned—or responded to—industrial growth to the same extent in the Soviet Union as in the United States.

Comparisons of this sort cannot be made for growth in labor productivity, because sufficient data are not available for the earlier periods of

SUMMARY

U.S. history. On the basis of evidence for concurrent periods already reviewed, it would seem unlikely that Soviet industry has outperformed U.S. industry of the latter part of the nineteenth century in this respect.

Concluding Remarks

Soviet industrial growth has been impressive. In volume of output alone—no account being taken of human and resource cost, product mix, or the use made of products—Soviet percentage growth has exceeded U.S. growth over contemporary periods, though not over comparable ones. If the U.S. record of growth in industrial output has been impressive in and of itself, without regard for the important consideration of how it has been accomplished, then so has the Soviet record been, in the same limited sense.

At the same time, the Soviet record is neither unprecedented nor inexplicable. As noted, it has been at least matched in the United States under more or less comparable basic conditioning factors, except the economic system; it is being exceeded now by a number of countries in the West, such as Japan, Taiwan, West Germany, and Greece, all of which have experienced a more rapid rate of growth since 1950 than the Soviet Union. Since 1953 it has been roughly matched by France and Italy.

The explanation for the Soviet record lies in the unity of purpose and practice on the part of the rulers—enhancement of state power—and in their selective mobilization of resources—systematic favoring of industry over other sectors and of investment over consumption, including leisure. The cost has been heavy, in terms of resources expended as well as human suffering. The amount of output generated per unit of labor is a fraction of that characterizing industry in the United States, and it has become a progressively smaller fraction despite the fact that industrial capital has apparently grown faster in the Soviet Union than in the United States.

This may all change in the future. We can expect a further gaining on the United States in relative level of industrial output over the years immediately in view, though this need not lead to a reducing of the absolute gap or to an overtaking. There may well be gains in other respects as well. In any case, we cannot know the future from the course of the past. The most we can ask of history is some perspective, some background, against which we can more meaningfully view the unfolding present and interpret the receding past. It is this background that we have tried to sketch here, in a book now at an end.