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**GROWTH OF INDUSTRIAL PRODUCTION  
IN THE SOVIET UNION**



## CHAPTER 1

### Introduction

FOUR centuries of Tsarist rule in Russia came to an end in mid-March 1917. The succeeding provisional government stayed in power only a few months, and by mid-November the precursor of the Communist Party, under the leadership of Lenin, had assumed control of the central government, marking the origin of a new political order later named the Union of Soviet Socialist Republics. Our purpose is to study the record of industrial growth in that political order over the forty-odd years that have passed since its founding.

#### *A Sketch of Developments*

At the outset the country endured a civil war lasting through 1920 and accompanied by a precipitous decline in economic activity: industrial production contracted by 80 per cent, agricultural production by perhaps 50 per cent. The population shrank by five million as war losses were compounded by famine and pestilence. The existing economic order was supplanted by a disorganized and quasi-military system later called "War Communism," which was in turn replaced by the interim New Economic Policy (NEP) when social and economic conditions became chaotic. After eight years of recovery, economic activity approached once again, with notable exceptions, its prerevolutionary level.

Late in 1928 the economic order took on its now characteristic nature with the introduction of the First Five Year Plan, aimed primarily at accelerating industrial growth. Within the first year of its operation, agriculture was collectivized with the resultant disruption in the rural economy accompanied by famine and large-scale destruction of agricultural capital. Against this background, industry grew rapidly through 1933,<sup>1</sup> persons engaged increasing by about 60 per cent, man-hours of work by about 40 per cent, and output by about 50 per cent.

The already rapid industrial growth accelerated during the Second Five Year Plan, which began in 1933, output approximately doubling. Over the four years 1933-1937, persons engaged increased by about 40 per cent, man-hours worked by about 45 per cent, and output by about 85 per cent.

NOTE: Industry will be defined throughout in accord with Soviet usage, including manufacturing, mining, logging, fishing, and generating of electricity.

<sup>1</sup> The year 1933 is used as a terminal date here instead of 1932, because employment in the latter year is not accurately known.

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In the face of a widespread political purge that depleted administrative and technical leadership, growth slackened in the short-lived Third Five Year Plan, terminated by World War II. The growth in industrial output in this period, 1937–1940, was no larger than can be attributed to territorial gains growing out of the Hitler-Stalin pact.

World War II brought with it enormous losses in property and human life. While Lend-Lease deliveries helped offset the losses in production, industrial output stood in 1945, after German-occupied territories had been regained, at some 80 per cent of the prewar level, and this figure is probably too high because of the tendency to overstate wartime output in production indexes. In 1946, after a rapid reconversion, output stood at less than 60 per cent of its prewar level. Recovery was swift in the Fourth Five Year Plan, begun in 1946, so that the prewar level of industrial output was apparently regained by 1948 or 1949. In the Fifth Five Year Plan, beset by new disturbances in the form of the Korean War and the political succession after Stalin's death, industrial expansion continued at a rapid pace: over the five years, persons engaged increased by about 20 per cent, man-hours worked by about 10 per cent, and output by about 60 per cent. Since 1955 the rate of expansion has retarded somewhat, though output has apparently continued to grow at an average rate of 7.1 per cent a year compared with 9.6 per cent over 1950–1955.

### *Which Period to Study*

In view of this history of spurts of growth interspersed with major disturbances, one may wonder whether it makes sense to study industrial growth over the entire Soviet period. Perhaps it would be best to eliminate years of disturbance and consider only periods of sustained growth, on the ground that economic performance may be misrepresented if growth is attributed to years of stagnation and decline as well as to years of expansion. This view is persuasive, but it implies a limited objective in studying Soviet industrial history.

How we study history depends on what we wish to learn from it. We could never list all the things we wish to learn, or design a specific historical study to meet truly general interests. Every investigator is inevitably motivated more by some interests than by others, but two basic approaches to history may be distinguished. A study may aim at getting the record straight, at describing events "as they really happened." Or it may aim at drawing lessons from history, to be utilized in some way or other in dealing with the future. It is trite to say that neither approach can stand by itself: the facts to be set straight must be selected from a

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boundless volume; they must be relevant to something, and this usually means that they must bear on lessons sought from history. Similarly, useful lessons must be derived from an accurate record.

There is, nevertheless, a distinction to be drawn, if only of degree rather than kind. Lesson-seeking sheds light on a narrower set of issues than fact-seeking, and they tend to be more ephemeral, reflecting topical questions of the day. Studies should, of course, be oriented to matters of importance today, but not so much that they lose worth as their importance fades.

Because of the tragic political conflict the West has had thrust upon it, there is at present deep concern over the immediate prospect that the industrial base of power may expand more rapidly in the Soviet Union than in the West. This has had much to do with attracting our attention to the best years of Soviet industrial growth and away from the worst. Most specialists on the Soviet economy start their studies with the year 1928, when comprehensive centralized planning was introduced. Some go further and argue that the period of war and postwar recovery should be eliminated from consideration, leaving the years 1928–1940 and 1948–1958 for study. All growth should be attributed to those years alone, according to this view;<sup>2</sup> otherwise predictions of future growth rates are likely to be in serious error.

Even from this restricted point of view, one may doubt whether our eyes should be fixed solely on the best years of Soviet growth. Rapid expansion was favored in those times by unique circumstances not likely to be encountered again. At the beginning of the Plan period, the Soviet Union had a large idle labor force to draw upon in expanding industry. It also had at its disposal a large pool of as yet unutilized Western technology, available at relatively low cost because of depressed business conditions in the industrialized world. The Russian people were prepared to work hard and undergo sacrifices in order to make up for lost time. The government made them work even harder by methods that could not be used indefinitely.

After World War II there was again a willingness on the part of the people to endure, and the government to impose, abnormal hardships in order to make a rapid recovery and to achieve the level of economic

<sup>2</sup> For examples of these attitudes, see *Soviet Economic Growth: A Comparison with the United States*, Joint Economic Committee, Congress of the United States, Washington, 1957, p. 22, footnote 9; Gregory Grossman in *American Economic Review*, May 1957, pp. 643 ff; and Hans Heyman, Jr., in *idem*, May 1958, pp. 423 ff, and in *Comparisons of the United States and Soviet Economies*, Joint Economic Committee, Congress of the United States, Washington, 1959, Part I, p. 8.

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acuity that would have obtained in the absence of war. War losses were very heavy, and they placed a big handicap on postwar economic growth. But there were also factors helping offset this handicap: expansion of territory and resources, extension of political control over the so-called satellite countries, receipt of Western economic aid during and immediately after the war, employment of prisoners of war and other forced labor, and collection of reparations from defeated countries. There was, in addition, a second wave of technological innovation from the outside following wartime contact with the West and acquisition of Western goods on a large scale in the form of economic aid and reparations.

Prediction of future growth is always precarious, and one seldom knows in advance what kind of evidence on past performance will be most helpful. While nature may make a political leap through revolution, it seldom makes an economic leap. Economies do not rise phoenix-like from their own ashes; they grow out of the past. Hence, the production record of the future cannot be fully disconnected from the "trend" of the past. It would be as unwise to project as yet short-lived spurts of growth in a mechanical manner as simply to project the long "trend." The wisest course would seem to be to weigh evidence from both short and long periods of growth before making judgments on the future, the weight given to each depending on the problem at hand. Each person will do this in his own way.

When one is interested in more than predicting future growth, the long historical record becomes even more relevant. Often it is critical. We are, for example, interested in finding out how a Soviet-type economy performs over the course of history. For this purpose we wish to know how it responds to crises, generated both internally and externally, as well as how it performs under normal conditions. We also wish to know whether the economy generates its own disturbances. If we ignore bad years of growth merely because they are bad years, we beg matters at issue.

On a more concrete level, we may be misled about the forces responsible for growth by ignoring years of disturbance. As we shall see later, Soviet industrial output has apparently multiplied between six and seven times since the revolution. Let us attribute this growth entirely to the years in which aggregate output rose beyond a previous peak—that is, to the period 1928–1940 and 1948–1958. We then say that the 1958 level—and presumably a comparable composition—of output could have been reached by 1939: output could have multiplied six to seven times between 1917 and 1939 under "normal" circumstances.

This conclusion seems unreasonable on its face, and reflection shows

why. Aside from the fact that time was required to consolidate the revolution and to develop a working economic system, things were happening over the period 1917–1928 that contributed to later economic growth. Population increased by nine million people, or 6 per cent. Output grew substantially in some industrial sectors, even though not in the aggregate: by 50 per cent in fuel and electricity; by 46 per cent in chemicals; by 151 per cent in agricultural equipment; and 58 per cent in consumer durables. Progress was made in eliminating widespread illiteracy.<sup>3</sup> And, probably most important, great technological advances were being made in the outside world, advances that the Soviet Union inherited with the inauguration of the Plan period. In short, productive capacity was expanding over these years even though actual output was not. Some of these same factors were operating similarly during World War II, though it is much more doubtful, because of very heavy war losses, that on balance they raised productive capacity.

We know, of course, only what has been, not what might have been. Things would have been different had the Soviet Union not suffered a civil war, political instabilities, and a major world war. But we shall never know in what specific respects they would have been different. The weight we give to “abnormal” elements must ultimately be a matter of judgment, depending on the issue at hand.

We have tried to make this a fact-seeking study, useful for many different purposes, and have therefore examined Soviet industrial performance over the long as well as the short run. As each topic is taken up, long-run performance is generally discussed first, and shorter-run performance is then viewed within this perspective. There are drawbacks to this approach from some points of view, but it has seemed to us best all round.

### *Periods and Subperiods*

Except for brief discussions of the Tsarist period and the last few years, our study covers the period 1913–1955, or 42 years.<sup>4</sup> We shall often refer to this as the “entire Soviet period,” though that is obviously not

<sup>3</sup> See, e.g., W. H. Chamberlin, *Soviet Russia*, Boston, 1931, pp. 286 ff.

<sup>4</sup> The period beginning at the end of 1913 and continuing through 42 years can be designated as either 1914–1955 or 1913–1955. The first must be read as meaning “from the beginning of 1914 to the end of 1955,” the second as “from the end of 1913 to the end of 1955.” Neither form seems to be firmly established in usage, and both have shortcomings. We have chosen the second as more convenient for two reasons: first, the number of years of growth in a period is easily found by subtracting the beginning year from the last; and second, the terminal years of each period correspond to benchmark dates. The primary drawback is the confusion that may be caused about the beginning year for a five year plan. Thus, when the Second Five Year Plan is referred to as the period 1932–1937, it must be remembered that the initial year of the plan was 1933.

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strictly correct. The use of 1913 as the prerevolutionary benchmark accords with general practice, which can be justified on the ground that this was the last normal year before World War I. In any case, use of other prerevolutionary benchmarks is precluded for most purposes since some output data are available only for Tsarist territory, whereas the data for 1913 have been generally adjusted by Soviet statisticians to the interwar Soviet territory. The closing date for most analysis had to be 1955 because of the time spent on the study. That year also marked the end of the Fifth Five Year Plan, the last completed plan to date.

The Soviet period divides naturally into two major parts: the pre-Plan period, covering 1913–1928, and the Plan period, covering 1928–1955. The former may be subdivided into the periods of World War I and War Communism (1913–1920) and the NEP (1920–1928); the latter, into the periods for the component five year plans, with an interruption for World War II (1940–1945). These plans were as follows:

- First: 1928–1932
- Second: 1932–1937
- Third: 1937–1940
- Fourth: 1945–1950
- Fifth: 1950–1955

This breakdown of periods and subperiods has an obvious advantage in that it corresponds to well-known chronology. We follow it not so much for this reason, but because Soviet statistics are organized to cover these periods—particularly the plans—and therefore are more plentiful for the terminal dates than for intermediate years. While it might be desirable to date some periods differently for purposes of economic analysis, we are limited in doing so by shortage of data.

### *Nature and Plan of the Study*

The basic purpose of this study is to describe the historical record of Soviet industrial production. An economist's job has, of course, only

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On another matter of dating, we have generally sacrificed accuracy for simplicity. Beginning with the fall of 1921, a fiscal year was established in the Soviet Union for economic accounting, the year starting on October 1. This practice was continued until the fall of 1930, when the calendar year was re-established as the accounting unit. We have made no effort to adjust data for fiscal years to a calendar year basis since any adjustment would be essentially arbitrary without improving analysis. We have, nevertheless, followed the practice of designating a fiscal year by the calendar year in which it ended, unless greater precision is called for in the nature of the discussion. Hence, the year 1927/28 is generally referred to as 1928, 1928/29 as 1929, and so on.

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begun when he describes events in a manner relevant to causal analysis, but we have limited ourselves primarily to this task in order to put first things first. We hope to provide raw materials for analysis to the extent allowed by the scope of our study, by the shortcomings of Soviet statistics, and by the limits to our own capabilities.

It has been said that the Soviet Union is more than a mystery: it is a secret. The greatest handicap to study of the Soviet economy is the absence of a coherent body of relevant and reliable statistics. The weaknesses of the data are outlined in the second chapter and to some extent in the third, although the latter is primarily concerned with qualitative aspects of industrial growth. This rather lengthy background discussion presents the necessary qualifications against which the statistical analysis of the remainder of the book should be continually viewed. In this sense, the second and third chapters are as essential to a proper understanding of Soviet industrial growth as the quantitative measures developed later.

The difficulties with data also account in part for the organization of topics. We proceed from simple to more and more complex methods of describing growth, starting with an analysis of growth in physical output of individual industries and ending with an analysis of growth in aggregative output as measured by production indexes. This procedure of leading up to aggregates seems to be justified on other counts as well, in particular because the discontinuous nature and shifting structure of Soviet industrial growth create difficult problems of measurement if we use conventional index numbers, to say nothing of the difficulty of finding appropriate weighting factors.

Statistical and measurement problems being so central, we have tended to place more discussion of technical issues in the text than might ordinarily be called for, particularly in Chapter 5, in which the data and techniques underlying our production indexes are discussed and our indexes are compared with those computed by others. We have felt it necessary to provide meticulous explanations there and at several other points in the book at the expense, perhaps, of readability. The general reader may often find this annoying if not plain boring, and he may find it more tasteful to skip such sections, at least at first reading. Technical details may generally be omitted without breaking the continuity of discussion.

After setting out the aggregative measures and defining their limitations, we move on in the next two chapters to some interpretative discussion, intended as a rather introductory analysis of industrial growth. A broad view is given first, followed by a focusing on selected details.

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We make liberal comparisons of Soviet and U.S. industrial growth, particularly in Chapter 8, not only to give perspective but also to supplement the inferences that can be drawn about Soviet growth from the limited data available. That is to say, there is something to be gained by reasoning through an expanded analogy. We know much more about U.S. industry than we do about Soviet industry, and we are therefore in a position to judge indirectly the adequacy of our knowledge of Soviet industry, and perhaps to extend our knowledge, by taking advantage of relevant analogies. Both for this purpose and to provide a perspective against which Soviet growth can be appraised, it would have been preferable to make comparative studies involving other countries as well. We have not done this because of the need to publish the basic findings of our study within a reasonable time limit. Relevant data for the United States are readily available; they are more difficult to find for other countries. We leave these important comparative studies to other scholars, with the assurance that they will not be neglected.

Since a study of this magnitude and complexity does not lend itself to a simple summary of findings, we do not attempt to provide one at this point. Instead, the last chapter is designed to be a more or less self-contained summary. Those readers who prefer an advance perspective may wish to read this last chapter at the start as well as the end.

It is suitable to conclude these introductory comments by acknowledging the heavy debt we owe to scholars who have devoted themselves to study of the Soviet economy. Their contribution to our work is pervasive and cannot be singled out or summarized. Nor is it fully reflected in the numerous citations throughout the book. This study falls within the stream of expanding knowledge about the Soviet economy, drawing heavily on what has come before and, we hope, adding something to it.